



H·CUP

HEALTHCARE COST AND UTILIZATION PROJECT



Agency for Healthcare
Research and Quality



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Table of Contents

Introduction	1
Summary	3
Cardiovascular/Cerebrovascular Conditions	4
Number of Discharges	5
Average Total Hospital Cost	7
Average Length of Stay	9
In-Hospital Mortality Rate	11
Acute Myocardial Infarction	14
Number of Discharges	15
Average Total Hospital Cost	17
Average Length of Stay	19
In-Hospital Mortality Rate	21
Coronary Artery Disease and Coronary Atherosclerosis	24
Number of Discharges	25
Average Total Hospital Cost	27
Average Length of Stay	29
In-Hospital Mortality Rate	31
Congestive Heart Failure	34
Number of Discharges	35
Average Total Hospital Cost	37
Average Length of Stay	39
In-Hospital Mortality Rate	41
Stroke and Acute Cerebrovascular Disease	44
Number of Discharges	45
Average Total Hospital Cost	47
Average Length of Stay	49
In-Hospital Mortality Rate	51
Atrial Fibrillation	54
Number of Discharges	55
Average Total Hospital Cost	57
Average Length of Stay	59
In-Hospital Mortality Rate	61
Cardiovascular/Cerebrovascular Procedures	64

<u>Number of Discharges</u>	<u>65</u>
<u>Average Total Hospital Cost</u>	<u>67</u>
<u>Average Length of Stay</u>	<u>69</u>
<u>In-Hospital Mortality Rate</u>	<u>71</u>
<u>Coronary Artery Bypass Graft</u>	<u>74</u>
<u>Number of Discharges</u>	<u>75</u>
<u>Average Total Hospital Cost</u>	<u>77</u>
<u>Average Length of Stay</u>	<u>79</u>
<u>In-Hospital Mortality Rate</u>	<u>81</u>
<u>Percutaneous Transluminal Coronary Angioplasty without Stents</u>	<u>84</u>
<u>Number of Discharges</u>	<u>85</u>
<u>Average Total Hospital Cost</u>	<u>87</u>
<u>Average Length of Stay</u>	<u>89</u>
<u>In-Hospital Mortality Rate</u>	<u>91</u>
<u>Percutaneous Transluminal Coronary Angioplasty with Stents</u>	<u>94</u>
<u>Number of Discharges</u>	<u>95</u>
<u>Average Total Hospital Cost</u>	<u>97</u>
<u>Average Length of Stay</u>	<u>99</u>
<u>In-Hospital Mortality Rate</u>	<u>101</u>
<u>Aortic Resection</u>	<u>104</u>
<u>Number of Discharges</u>	<u>105</u>
<u>Average Total Hospital Cost</u>	<u>107</u>
<u>Average Length of Stay</u>	<u>109</u>
<u>In-Hospital Mortality Rate</u>	<u>111</u>
<u>Carotid Endarterectomy</u>	<u>114</u>
<u>Number of Discharges</u>	<u>115</u>
<u>Average Total Hospital Cost</u>	<u>117</u>
<u>Average Length of Stay</u>	<u>119</u>
<u>In-Hospital Mortality Rate</u>	<u>121</u>
<u>Appendix I: HCUP Data Partners</u>	<u>124</u>
<u>Appendix II: Definitions for Cardiovascular/Cerebrovascular Conditions and Procedures</u>	<u>125</u>
<u>Appendix III: Methods</u>	<u>131</u>

Introduction

Cardiovascular and cerebrovascular diseases are significant healthcare issues, affecting nearly 40 percent of Americans.¹ Heart disease and stroke are the first and fourth leading causes of death in the United States, and these diseases are among the most common and costly reasons for hospital admissions.^{2,3} The prevalence of cardiovascular and cerebrovascular diseases increases with age, with cardiovascular disease occurring in fewer than 20 percent of adults age 20-39 but more than 70 percent of adults age 60-79.¹ Gender differences in these diseases also exist, with increasing rates by age of first major cardiovascular events for both men and women, but with a 10-year lag in the rates among women.¹ The Affordable Care Act provides up to \$100 million for community programs targeted at reducing chronic diseases, including heart disease and stroke, and another \$40 million for statewide efforts focused on chronic diseases.⁴

Timely information on trends for cardiovascular/cerebrovascular conditions and procedures provides analysts and policy makers baseline information and can be used to help evaluate the impact of health improvement efforts. A novel initiative from the Agency for Healthcare Research and Quality's (AHRQ) Healthcare Cost and Utilization Project (HCUP) is used in this report to produce timely, current inpatient statistics on cardiovascular/cerebrovascular conditions and procedures.

The HCUP State Inpatient Databases (SID) from 2001 to 2010 include about 330 million inpatient discharges from 46 States. The list of statewide data organizations that contribute to HCUP is available in Appendix I. In this report we use the historical SID data with early 2011 data from 10 HCUP States to develop national quarterly projections of 2011 and 2012 inpatient statistics for:

- cardiovascular/cerebrovascular system conditions, overall
- five specific cardiovascular/cerebrovascular conditions
- cardiovascular/cerebrovascular system procedures, overall
- four specific cardiovascular/cerebrovascular procedures.

¹ American Heart Association. *Heart Disease and Stroke Statistics – 2010 Update*. Dallas, Texas: American Heart Association; 2010.

² Kochanek KD, Xu JQ, Murphy SL, Miniño AM, Kung HC. *Deaths: Preliminary Data for 2009*. National Vital Statistics Reports; vol 59 no 4. Hyattsville, MD: National Center for Health Statistics. 2011.

³ Wier LM (Thomson Reuters), Levit K (Thomson Reuters), Stranges E (Thomson Reuters), Ryan K (Thomson Reuters), Pfuntner A (Thomson Reuters), Vandivort R (SAMHSA), Santora P (SAMHSA), Owens P (AHRQ), Stocks C (AHRQ), Elixhauser A (AHRQ). *HCUP Facts and Figures: Statistics on Hospital-based Care in the United States, 2008*. Rockville, MD: Agency for Healthcare Research and Quality; 2010 (<http://www.hcup-us.ahrq.gov/reports.jsp>).

⁴ Department of Health and Human Services, press releases dated May 13, 2011 (<http://www.hhs.gov/news/press/2011pres/05/20110513b.html>) and June 7, 2011 (<http://www.hhs.gov/news/press/2011pres/06/20110607a.html>).

Introduction (continued)

Statistics for each condition and procedure are reported in total and separately by adult age group (18-44 years, 45-64 years, and 65 years and older) and by gender. The cardiovascular/cerebrovascular conditions and procedures reported in this study are identified on an inpatient stay record. Appendix II includes specifications for the various cardiovascular/cerebrovascular conditions and procedures.

Four outcomes are projected for each cardiovascular/cerebrovascular condition and procedure: counts of inpatient discharges, average total hospital cost, average length of stay, and in-hospital mortality rate. Average total hospital costs reflect actual expenses incurred in the production of hospital services; the average costs do not include physician billing. No adjustment has been made to the costs to equate them to a constant year. However, a reference line is included that depicts the cost per admission in the first quarter of 2001 adjusted for economy-wide inflation only. In HCUP, the length of stay counts nights spent in the hospital. If a patient is admitted and discharged on the same day, the length of stay is zero. Mortality is in-hospital only; post-hospital mortality is not included.

A detailed explanation of the projection methodology is included in Appendix III. More information on HCUP is available on the HCUP User Support Website (<http://www.hcup-us.ahrq.gov>).

Summary

The following table summarizes the change from 2001 annual estimates to 2012 projected annual estimates for cardiovascular/cerebrovascular conditions and procedures included in this report for each of the four outcomes. Detailed graphs showing historical data and projections by quarter follow for each measure and outcome. The data presented in the table is for all adults. Graphs following this summary also show data for three age groups and by gender. Up or down arrows indicate change of over 10 percent between annual weighted estimates from 2001 to 2012. Dashes indicate inconsistent or little change.

Measure	Projected Annual Total Discharges for All Adults 2012	Change from 2001 to 2012 Projection for All Adults			
		Total Discharges	Average Total Hospital Cost	Average Length of Stay	In-Hospital Mortality Rate
Cardiovascular/Cerebrovascular Conditions	5,627,921	↓	↑	—	↓
AMI	576,637	—	↑	↓	↓
Coronary Artery Disease and Coronary Atherosclerosis	530,032	↓	↑	—	↓
CHF	927,991	—	↑	—	↓
Stroke and Acute Cerebrovascular Disease	570,531	—	↑	↓	↓
Atrial Fibrillation	459,882	↑	↑	—	↓
Cardiovascular Procedures	4,714,027	↑	↑	—	—
CABG	211,763	↓	↑	—	↓
PTCA without Stents	43,004	↓	↑	↑	↑
PTCA with Stents	509,081	↓	↑	—	↑
Aortic Resection	52,520	↑	↑	↓	↓
CEA	96,347	↓	↑	↓	↓

Cardiovascular/Cerebrovascular Conditions

Cardiovascular/cerebrovascular conditions consist of a broad spectrum of circulatory conditions including, but not limited to, acute myocardial infarction, coronary artery disease, coronary atherosclerosis, congestive heart failure, stroke, and atrial fibrillation. Using the HCUP SID from 2001 to 2010 and early 2011 data from 10 States, different outcomes for inpatient discharges with a cardiovascular/cerebrovascular principal diagnosis are projected for 2011 to 2012.

Projections include the following:

- Total inpatient discharges for all adults, adults by age group, and adults by gender. Discharge counts exclude inpatient stays that were transferred out to another acute care hospital. This ensures that these events are not double counted.
- Average total hospital cost for all adults, adults by age group, and adults by gender. Average total hospital cost reflects actual expenses incurred in the production of hospital services; physician costs are not included. For comparison, a line is included that depicts the change in the average inpatient hospital cost per admission in the first quarter of 2001 (Q1 2001) due solely to economy-wide inflation. The difference between the actual/projected cost line and the inflation-adjusted Q1 2001 cost line represents cost increases due to other non-inflation factors, such as new technology, patient case mix, etc.
- Average length of stay for all adults, adults by age group, and adults by gender. In HCUP, the length of stay counts nights spent in the hospital. If a patient is admitted and discharged on the same day, the length of stay is zero.
- In-hospital mortality rate for all adults, adults by age group, and adults by gender.

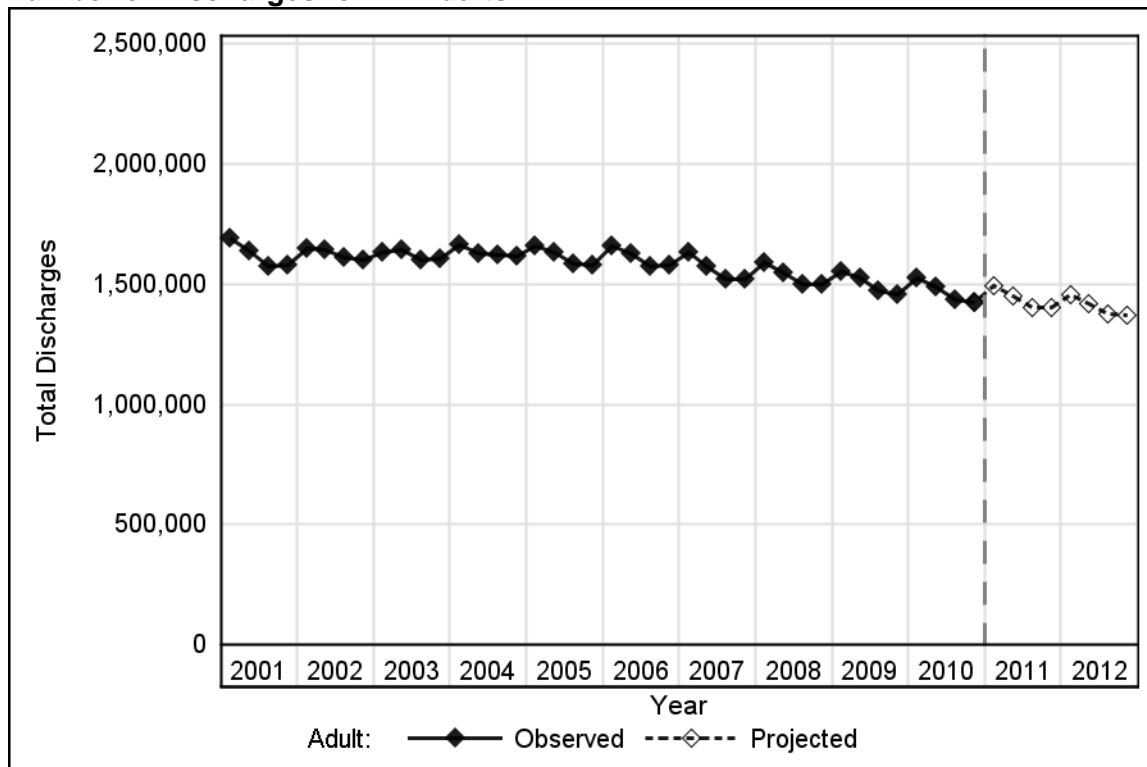
Cardiovascular/Cerebrovascular Conditions

Number of Discharges

Key Findings:

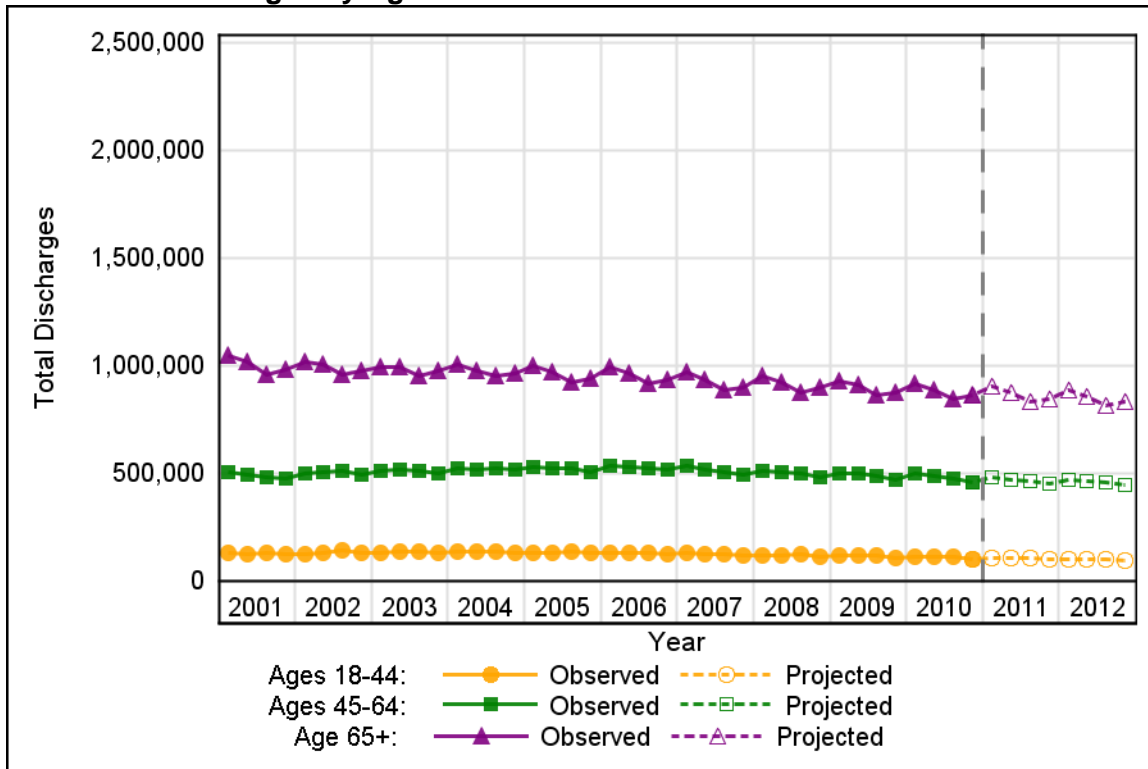
- The number of cardiovascular and cerebrovascular discharges remained relatively stable between 2001 and 2004, at about 1.6 million discharges per quarter, and then gradually decreased beginning in 2005. Discharges are projected to be about 1.4 million discharges per quarter in 2011 and 2012.
- Adults age 65 and older had the highest discharges, at about 1 million discharges per quarter in 2001 and decreasing to 877,000 discharges per quarter in 2010. Adults ages 45 to 64 had the next highest discharges, remaining relatively stable at about 506,000 discharges per quarter between 2001 and 2010. Adults ages 18 to 44 had the lowest discharges, at about 128,000 discharges per quarter in 2001 and decreasing to 110,000 discharges per quarter in 2010.
- The number of discharges was similar for males and females, remaining relatively stable at about 812,500 discharges per quarter between 2001 and 2004. Beginning in 2005, quarterly discharges began decreasing to about 733,500 discharges per quarter in 2010.

Number of Discharges for All Adults

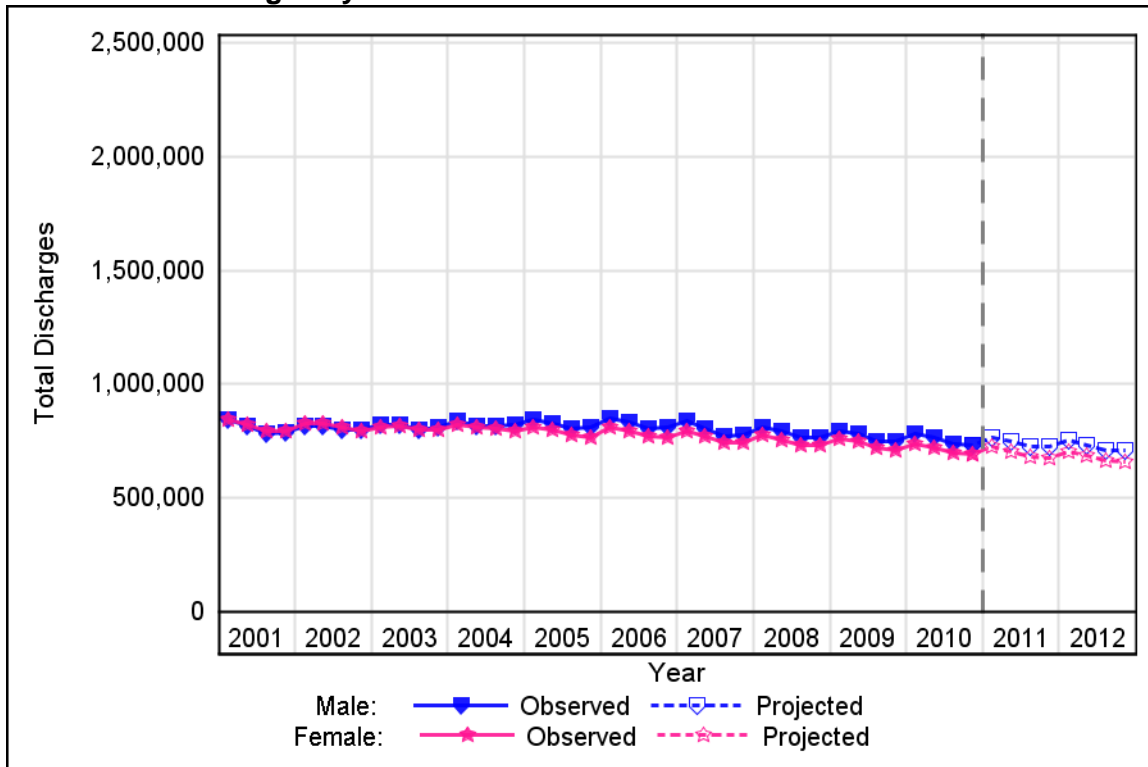


Source: Agency for Healthcare Research and Quality, Center for Delivery, Organization, and Markets, Healthcare Cost and Utilization Project, State Inpatient Databases.

Number of Discharges by Age



Number of Discharges by Gender



Source: Agency for Healthcare Research and Quality, Center for Delivery, Organization, and Markets, Healthcare Cost and Utilization Project, State Inpatient Databases.

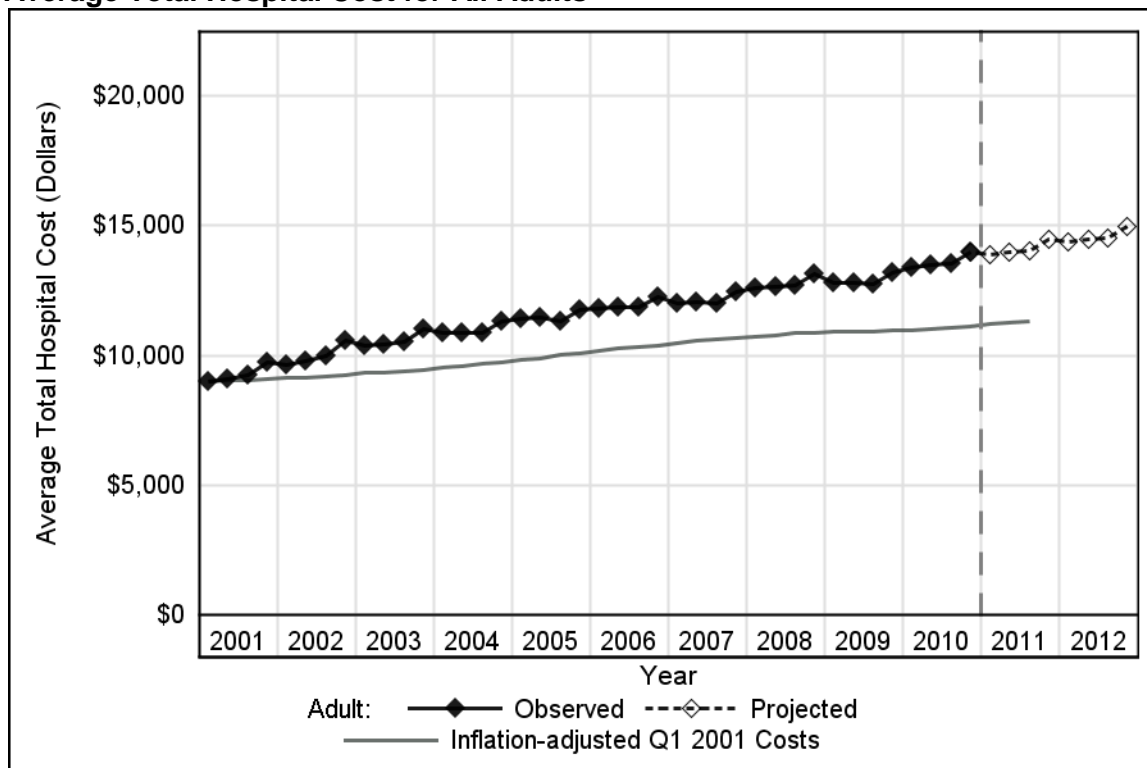
Cardiovascular/Cerebrovascular Conditions

Average Total Hospital Cost

Key Findings:

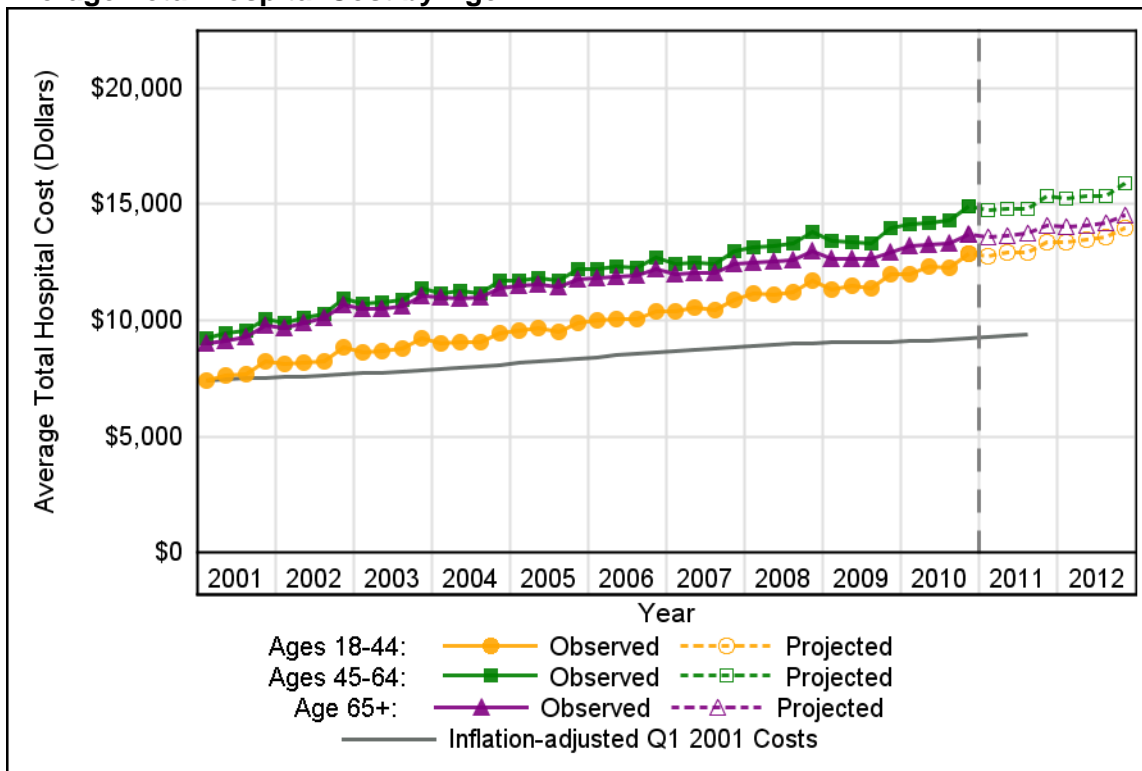
- The average hospital cost for discharges with cardiovascular and cerebrovascular conditions increased over time, from about \$9,500 in 2001 to \$13,500 in 2010. This increasing trend is projected to continue in 2011 and 2012, with the average hospital cost projected to be about \$15,000 at the end of 2012.
- The average hospital cost was similar for the two older age groups, increasing from about \$9,500 in 2001 to \$14,000 in 2010. Adults ages 18 to 44 had the lowest average hospital cost, at about \$8,000 in 2001 and increasing to \$12,500 in 2010.
- The average hospital cost was about \$2,500 higher for males than for females. Males had an average hospital cost that increased from about \$10,000 in 2001 to \$15,000 in 2010. Females had an average hospital cost that increased from about \$8,500 in 2001 to \$12,500 in 2010.
- Using the Gross Domestic Product (GDP) price index, a cost of \$9,500 in 2001 would be equivalent to a cost of \$12,000 in 2010. By 2010, the average hospital cost exceeded the cost expected by inflation alone.

Average Total Hospital Cost for All Adults

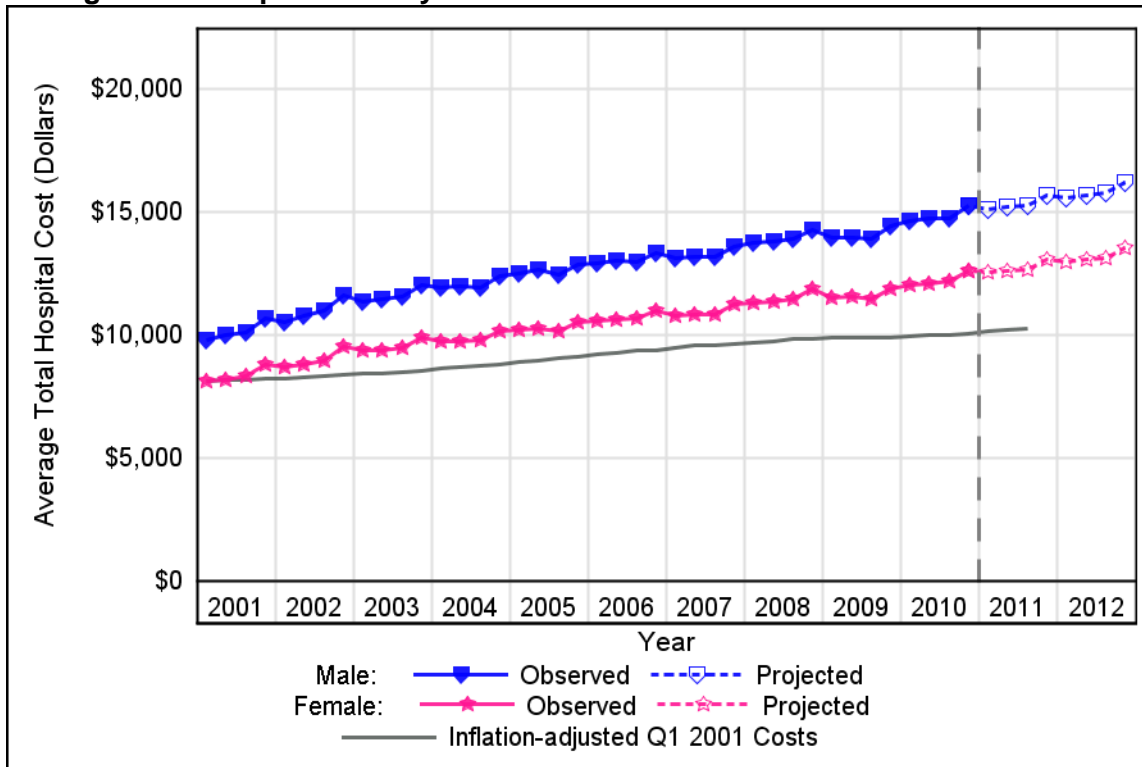


Inflation-adjusted Q1 2001 Costs: Cost per admission in the first quarter of 2001, adjusted for economy-wide inflation.
Source: Agency for Healthcare Research and Quality, Center for Delivery, Organization, and Markets, Healthcare Cost and Utilization Project, State Inpatient Databases.

Average Total Hospital Cost by Age



Average Total Hospital Cost by Gender



Inflation-adjusted Q1 2001 Costs: Cost per admission in the first quarter of 2001, adjusted for economy-wide inflation. Source: Agency for Healthcare Research and Quality, Center for Delivery, Organization, and Markets, Healthcare Cost and Utilization Project, State Inpatient Databases.

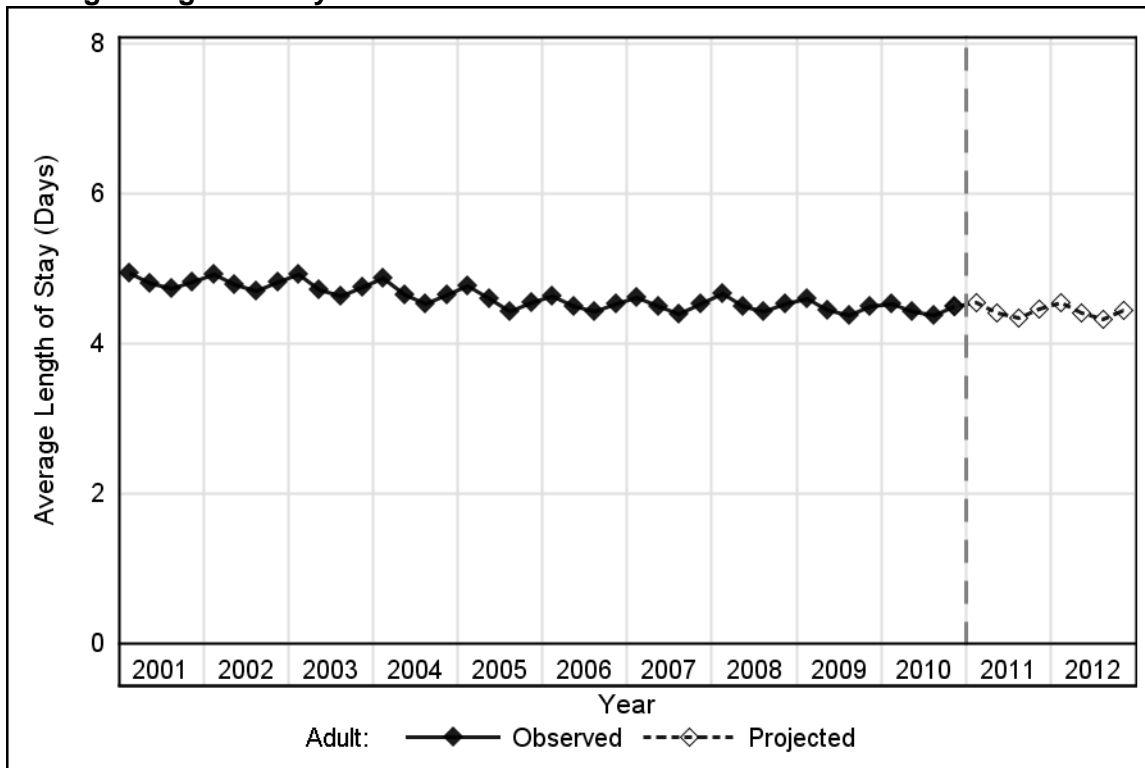
Cardiovascular/Cerebrovascular Conditions

Average Length of Stay

Key Findings:

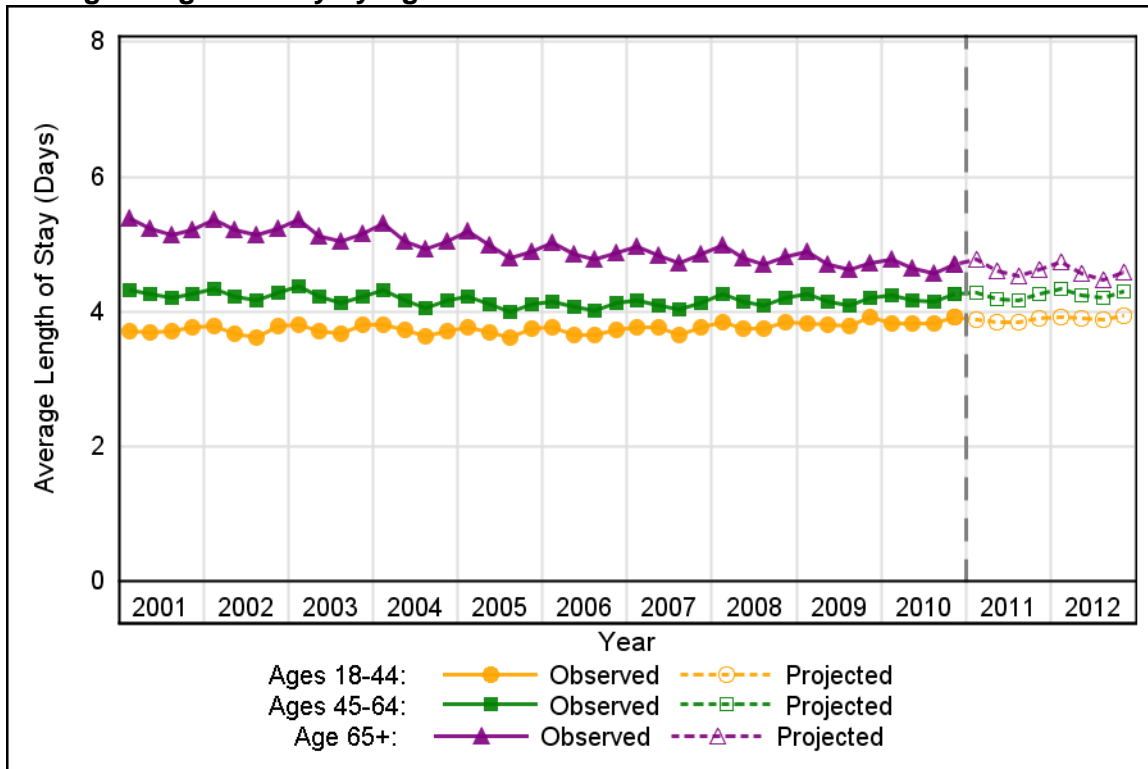
- The length of stay for discharges with cardiovascular and cerebrovascular conditions was relatively stable between 2001 and 2010 at 4.6 days. Length of stay is projected to remain at about this same level in 2011 and 2012.
- Adults age 65 and older had the longest length of stay at 5.2 days in 2001 and decreasing to 4.7 days in 2010. Adults ages 45 to 64 had the next longest length of stay at 4.2 days and remaining relatively stable over time. Adults ages 18 to 44 had the shortest length of stay at 3.8 days and remaining relatively stable over time.
- Length of stay was similar for males and females at 4.6 days.

Average Length of Stay for All Adults

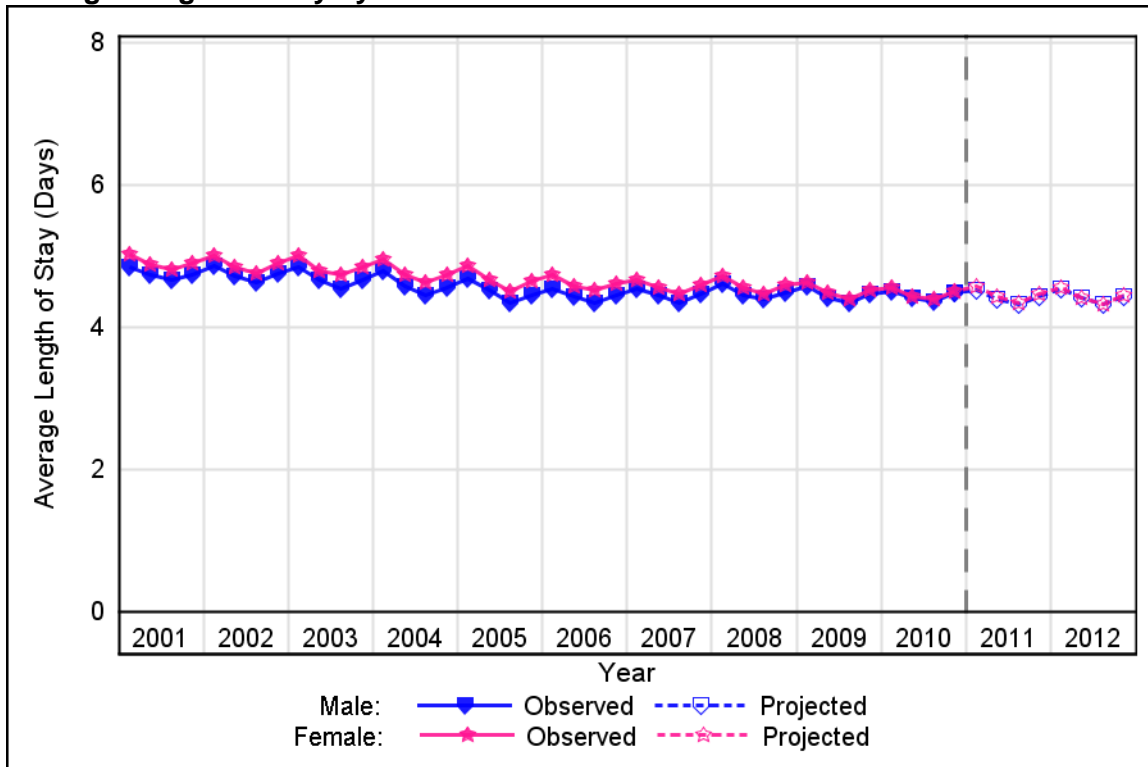


Source: Agency for Healthcare Research and Quality, Center for Delivery, Organization, and Markets, Healthcare Cost and Utilization Project, State Inpatient Databases.

Average Length of Stay by Age



Average Length of Stay by Gender



Source: Agency for Healthcare Research and Quality, Center for Delivery, Organization, and Markets, Healthcare Cost and Utilization Project, State Inpatient Databases.

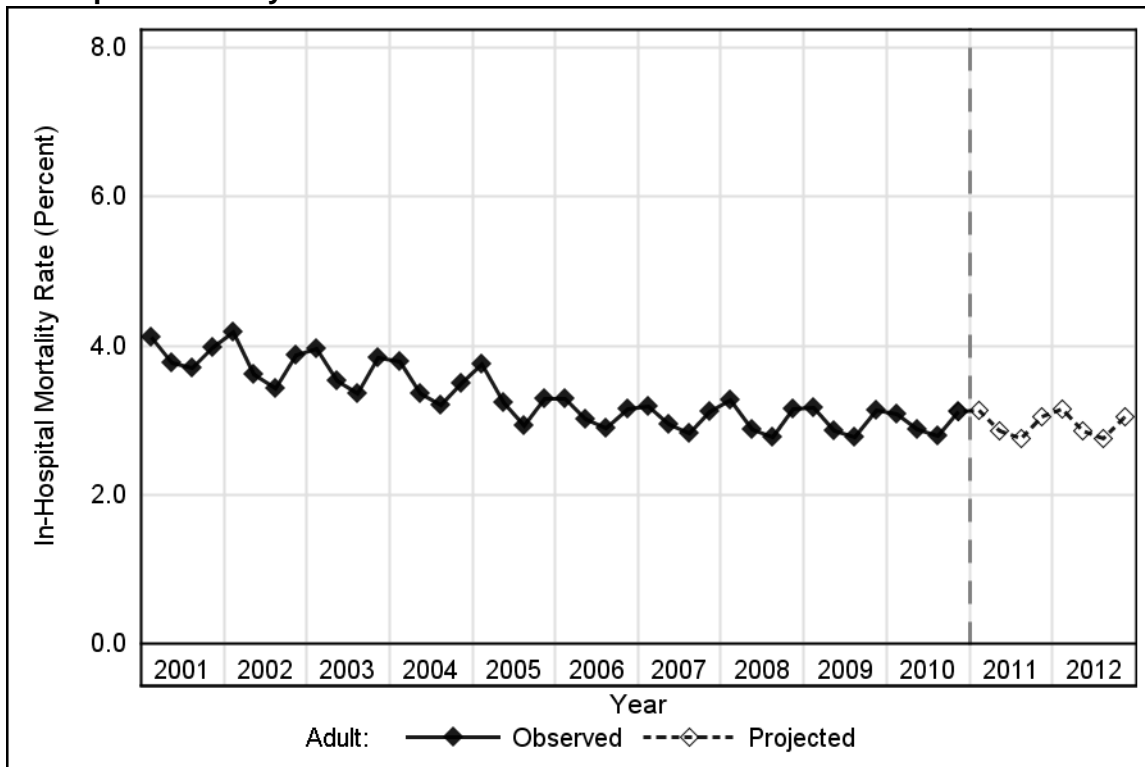
Cardiovascular/Cerebrovascular Conditions

In-Hospital Mortality Rate

Key Findings:

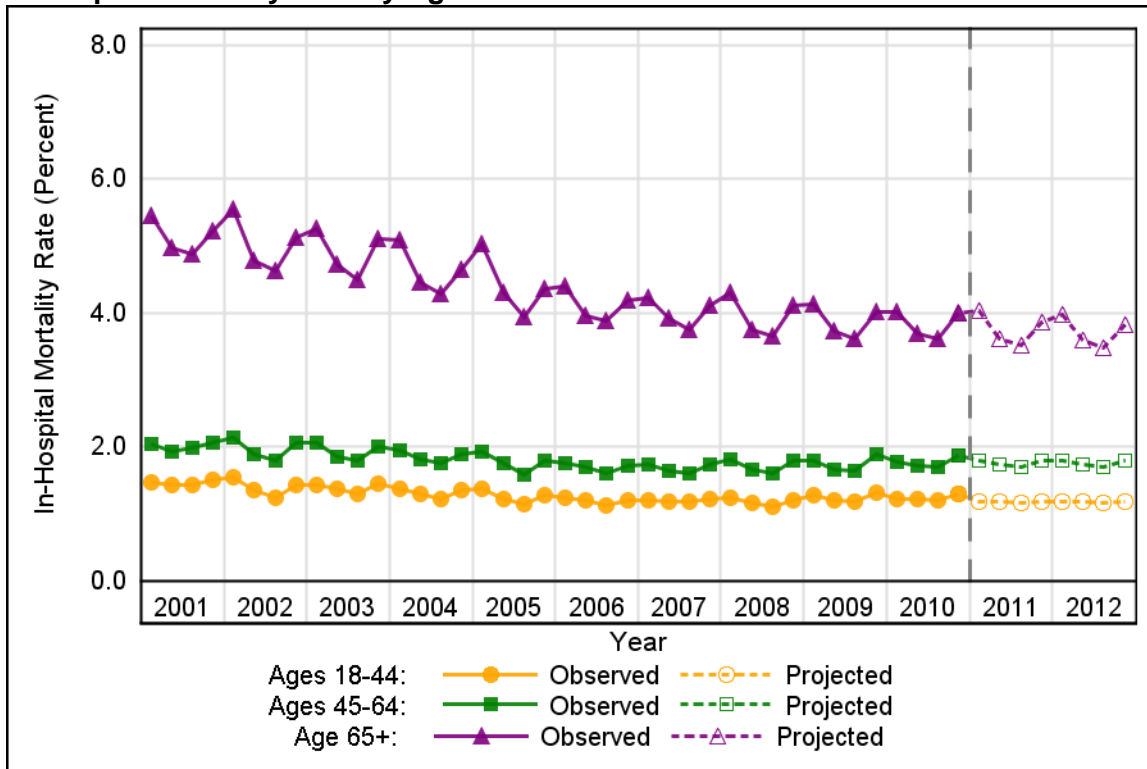
- The mortality rate for discharges with cardiovascular and cerebrovascular conditions decreased over time, vacillating around 3.9 percent in 2001 and decreasing to 3.0 percent in 2010. The mortality rate is projected to remain relatively stable in 2011 and 2012, vacillating around 2.9 percent.
- Adults age 65 and older had the highest mortality rate, at 5.1 percent in 2001 and decreasing to 3.8 percent in 2010. Adults ages 45 to 64 had the next highest mortality rate, at 2.0 percent in 2001 and decreasing to 1.8 percent in 2010. Adults ages 18 to 44 had the lowest mortality rate, at 1.5 percent in 2001 and decreasing to 1.2 percent in 2010.
- The mortality rate was 0.3 percentage points higher for females than for males. Females had a mortality rate that decreased from 4.1 percent in 2001 to 3.1 percent in 2010. Males had a mortality rate that decreased from 3.7 percent in 2001 to 2.8 percent in 2010.

In-Hospital Mortality Rate for All Adults

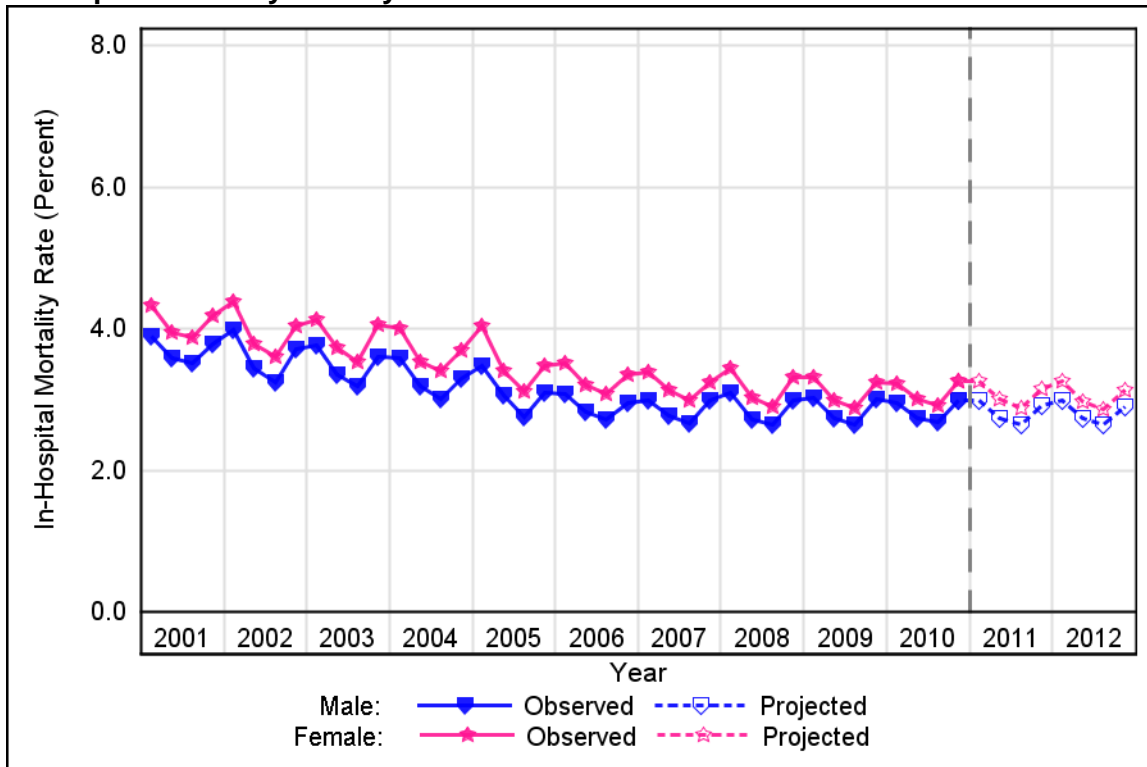


Source: Agency for Healthcare Research and Quality, Center for Delivery, Organization, and Markets, Healthcare Cost and Utilization Project, State Inpatient Databases.

In-Hospital Mortality Rate by Age



In-Hospital Mortality Rate by Gender



Source: Agency for Healthcare Research and Quality, Center for Delivery, Organization, and Markets, Healthcare Cost and Utilization Project, State Inpatient Databases.

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Acute Myocardial Infarction

An acute myocardial infarction (AMI) is commonly known as a heart attack. A heart attack occurs when blood flow to the heart is blocked. Using the HCUP SID from 2001 to 2010 and early 2011 data from 10 States, different outcomes for inpatient discharges with a principal diagnosis of AMI are projected for 2011 to 2012.

Projections include the following:

- Total inpatient discharges for all adults, adults by age group, and adults by gender. Discharge counts exclude inpatient stays that were transferred out to another acute care hospital. This ensures that these events are not double counted.
- Average total hospital cost for all adults, adults by age group, and adults by gender. Average total hospital cost reflects actual expenses incurred in the production of hospital services; physician costs are not included. For comparison, a line is included that depicts the change in the average inpatient hospital cost per admission in the first quarter of 2001 (Q1 2001) due solely to economy-wide inflation. The difference between the actual/projected cost line and the inflation-adjusted Q1 2001 cost line represents cost increases due to other non-inflation factors, such as new technology, patient case mix, etc.
- Average length of stay for all adults, adults by age group, and adults by gender. In HCUP, the length of stay counts nights spent in the hospital. If a patient is admitted and discharged on the same day, the length of stay is zero.
- In-hospital mortality rate for all adults, adults by age group, and adults by gender.

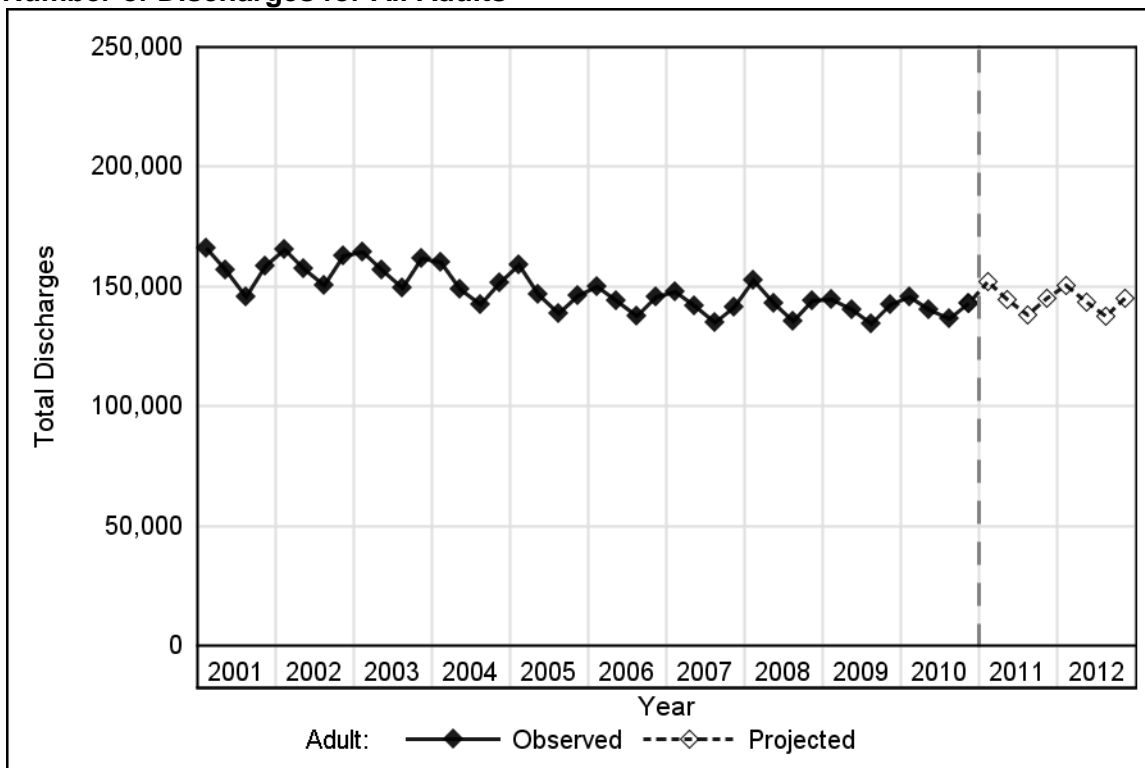
Acute Myocardial Infarction

Number of Discharges

Key Findings:

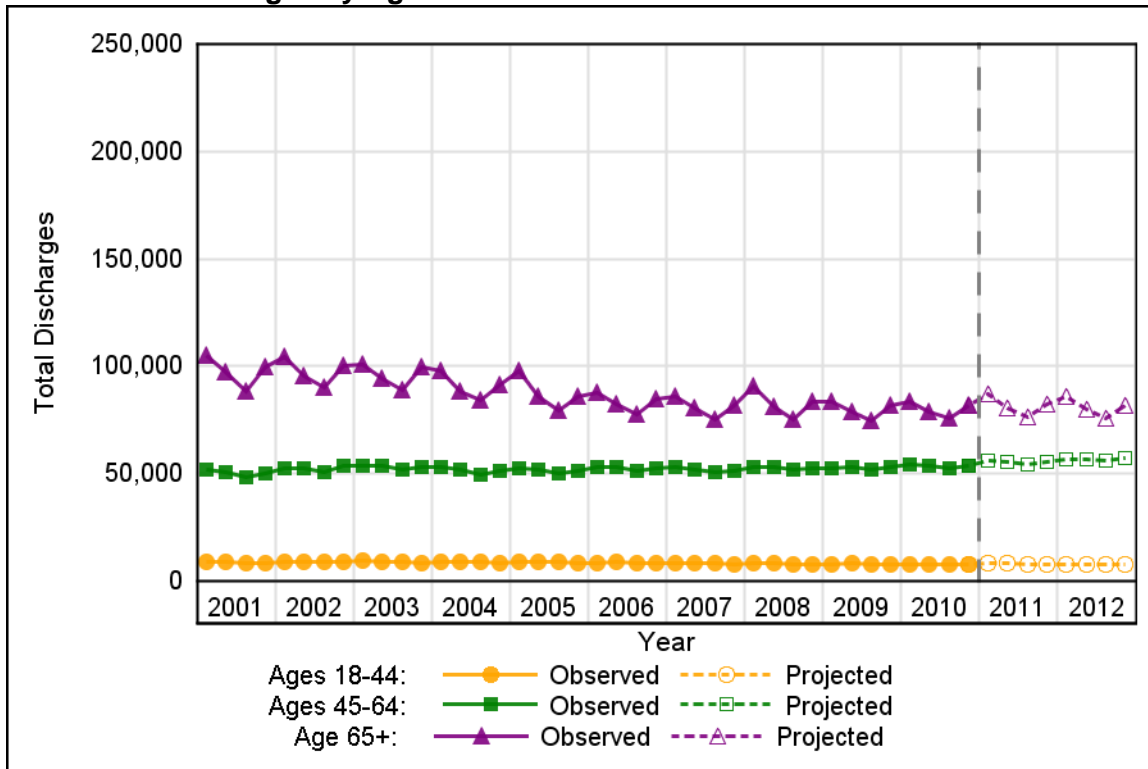
- The number of discharges for AMI was relatively stable over time, vacillating around 148,500 discharges per quarter. Discharges are projected to remain at about this same level in 2011 and 2012.
- Adults age 65 and older had the highest discharges, at about 97,500 discharges per quarter in 2001 and decreasing to 80,000 discharges per quarter in 2010. The two younger age groups had a relatively stable number of discharges, with about 52,000 discharges per quarter for adults ages 45 to 64 and 8,500 discharges per quarter for adults ages 18 to 44.
- Males had about 27,500 more discharges per quarter than did females. Males had a relatively stable number of discharges at about 88,000 discharges per quarter. Females had about 65,000 discharges per quarter in 2001, decreasing to 56,000 discharges per quarter in 2010.

Number of Discharges for All Adults

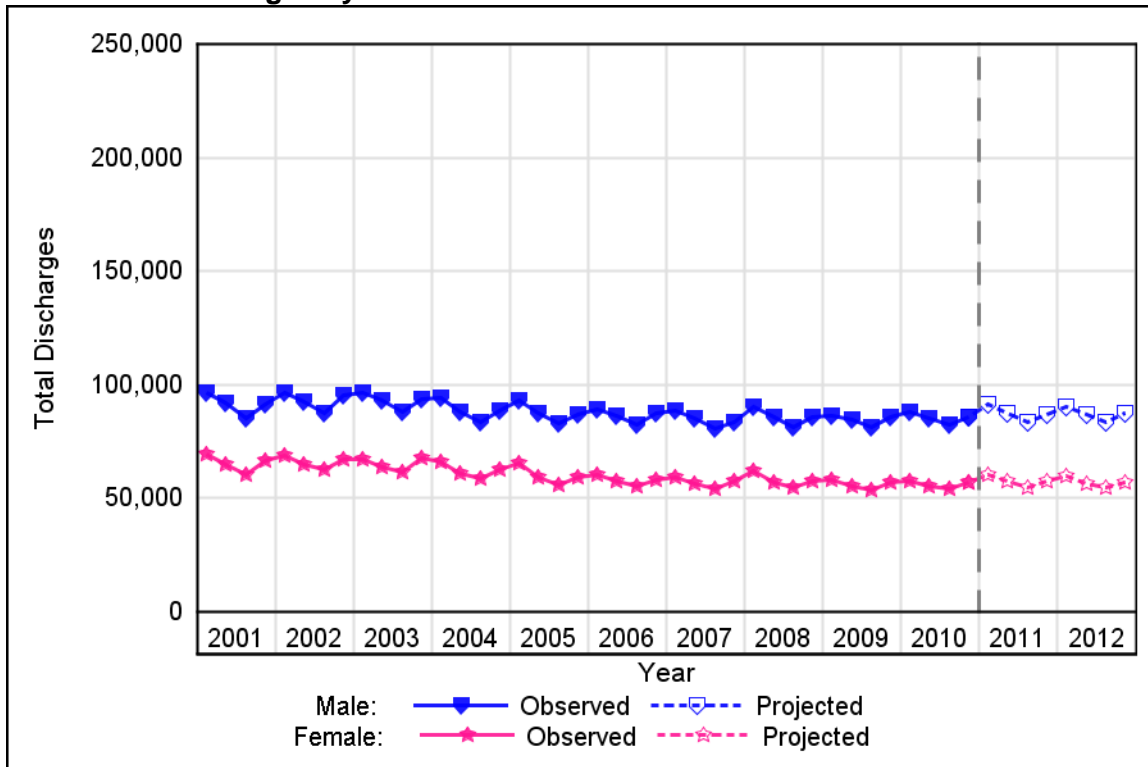


Source: Agency for Healthcare Research and Quality, Center for Delivery, Organization, and Markets, Healthcare Cost and Utilization Project, State Inpatient Databases.

Number of Discharges by Age



Number of Discharges by Gender



Source: Agency for Healthcare Research and Quality, Center for Delivery, Organization, and Markets, Healthcare Cost and Utilization Project, State Inpatient Databases.

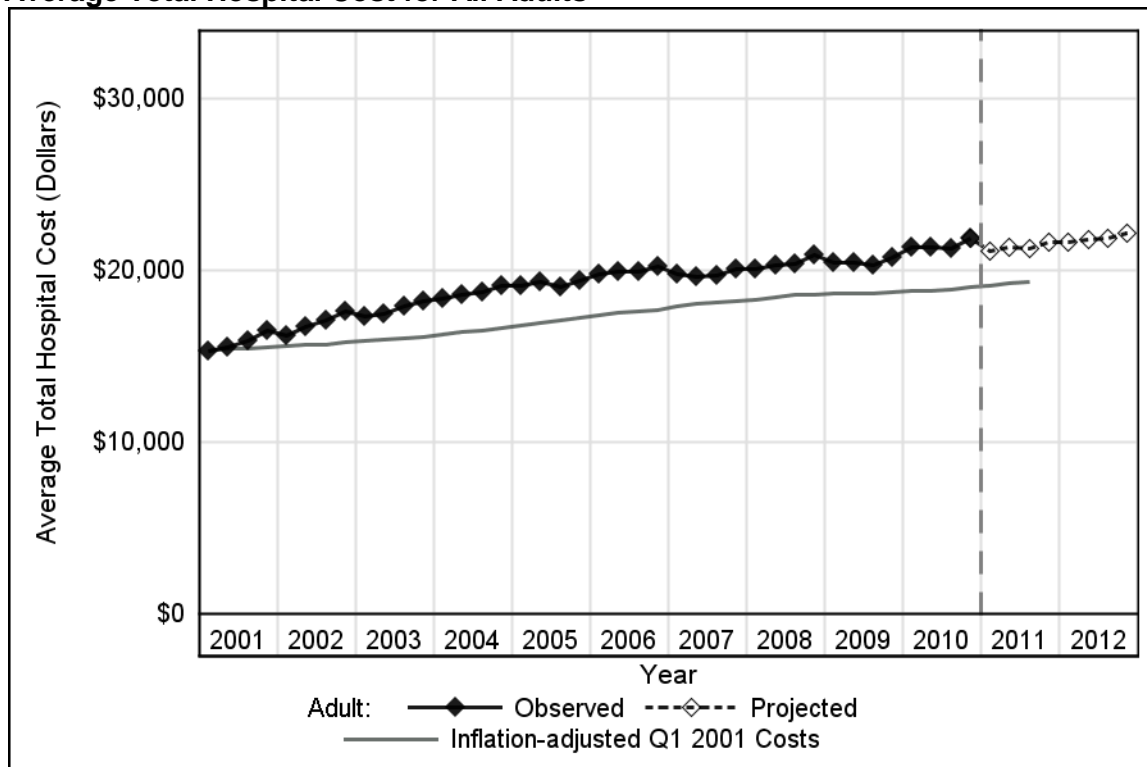
Acute Myocardial Infarction

Average Total Hospital Cost

Key Findings:

- The average hospital cost for discharges with AMI increased from about \$16,000 in 2001 to \$21,500 in 2010. The average hospital cost is projected to remain at about this same level in 2011 and 2012.
- The average hospital cost was highest for adults ages 45 to 64, increasing from about \$17,000 in 2001 to \$23,000 in 2010. The youngest and oldest age groups had similar average hospital cost, at about \$15,000 in 2001 and increasing to \$20,500 in 2010.
- The average hospital cost was about \$2,500 higher for males than for females. Males had an average hospital cost that increased from about \$16,500 in 2001 to \$22,500 in 2010. Females had an average hospital cost that increased from about \$14,500 in 2001 to \$19,500 in 2010.
- Using the Gross Domestic Product (GDP) price index, a cost of \$16,000 in 2001 would be equivalent to a cost of \$20,000 in 2010. The average hospital cost through 2010 remained relatively consistent with the cost expected by inflation alone.

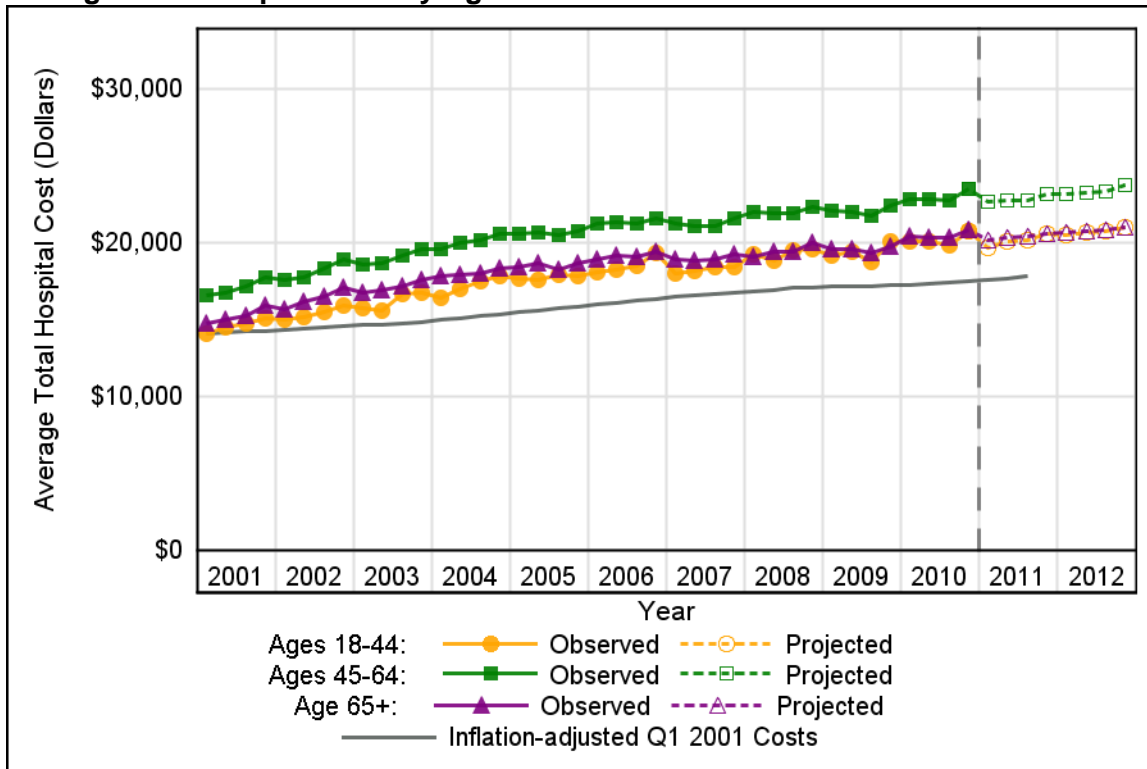
Average Total Hospital Cost for All Adults



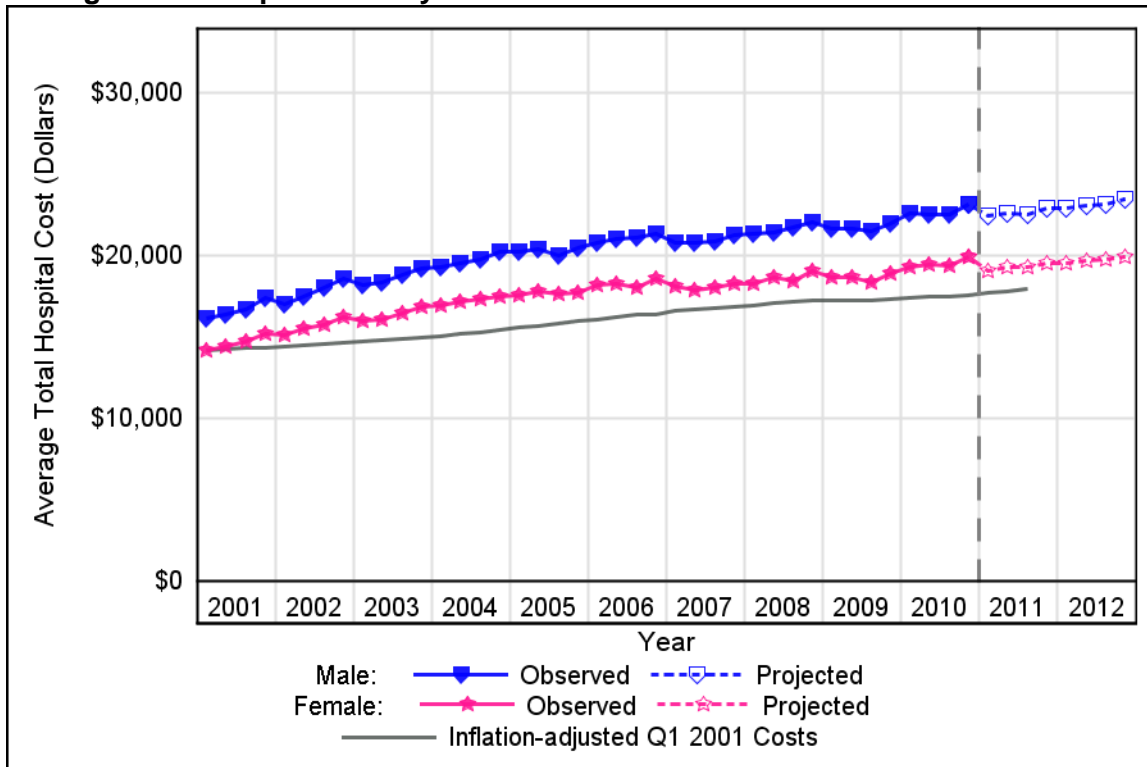
Inflation-adjusted Q1 2001 Costs: Cost per admission in the first quarter of 2001, adjusted for economy-wide inflation.

Source: Agency for Healthcare Research and Quality, Center for Delivery, Organization, and Markets, Healthcare Cost and Utilization Project, State Inpatient Databases.

Average Total Hospital Cost by Age



Average Total Hospital Cost by Gender



Inflation-adjusted Q1 2001 Costs: Cost per admission in the first quarter of 2001, adjusted for economy-wide inflation. Source: Agency for Healthcare Research and Quality, Center for Delivery, Organization, and Markets, Healthcare Cost and Utilization Project, State Inpatient Databases.

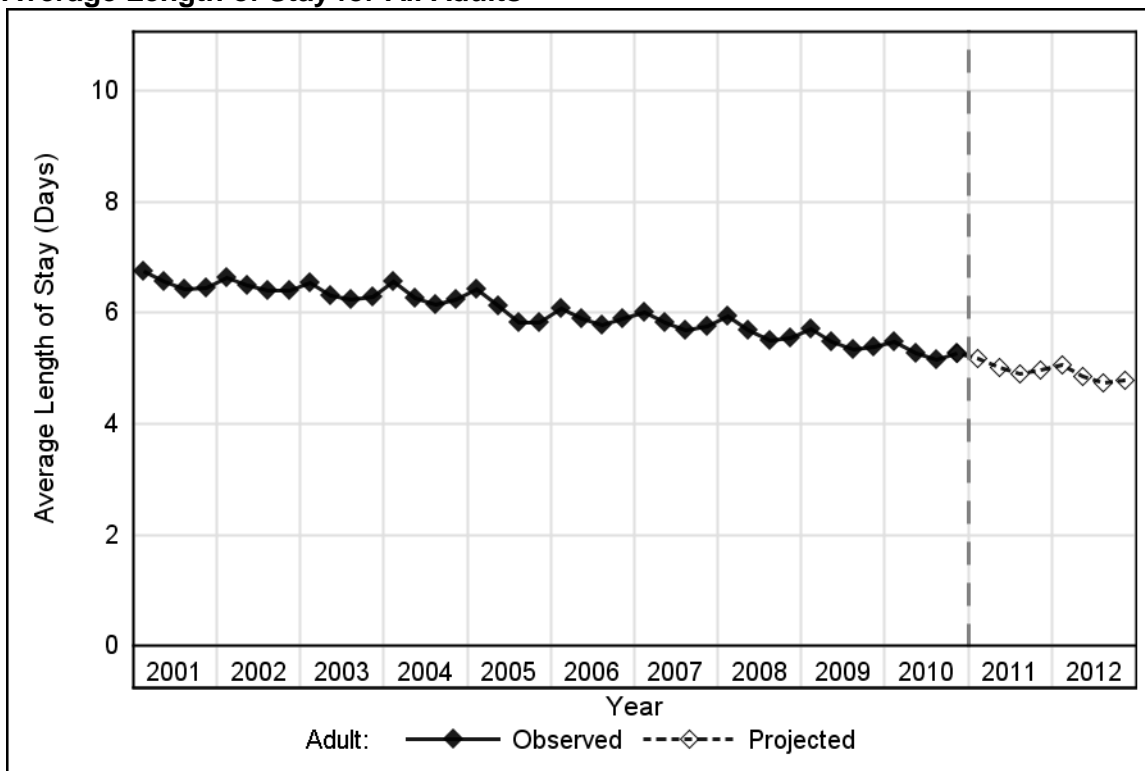
Acute Myocardial Infarction

Average Length of Stay

Key Findings:

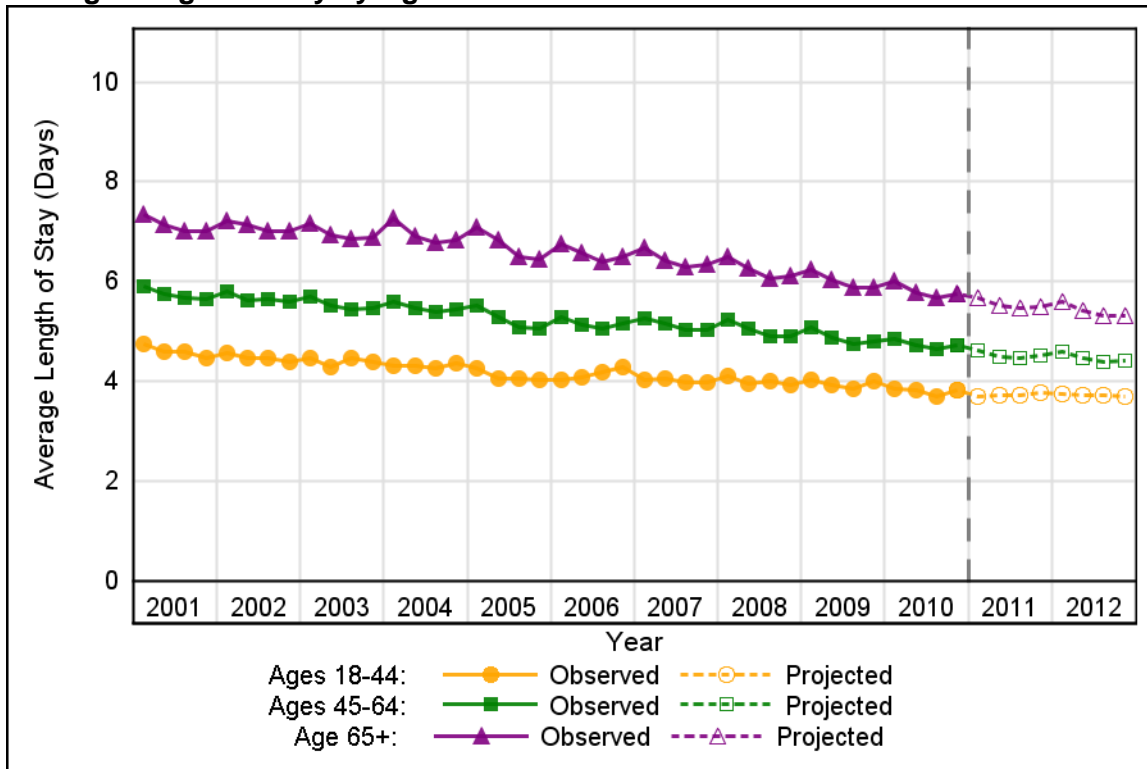
- The length of stay for discharges with AMI decreased over time, from 6.6 days in 2001 to 5.3 days in 2010. This decreasing trend is projected to continue in 2011 and 2012, with length of stay projected to be 4.8 days at the end of 2012.
- Adults age 65 and older had the longest length of stay, at 7.1 days in 2001 and decreasing to 5.8 days in 2010. Adults ages 45 to 64 had the next longest length of stay, at 5.8 days in 2001 and decreasing to 4.7 days in 2010. Adults ages 18 to 44 had the shortest length of stay, at 4.6 days in 2001 and decreasing to 3.8 days in 2010.
- Length of stay was similar for males and females, decreasing from 6.6 days in 2001 to 5.3 days in 2010.

Average Length of Stay for All Adults

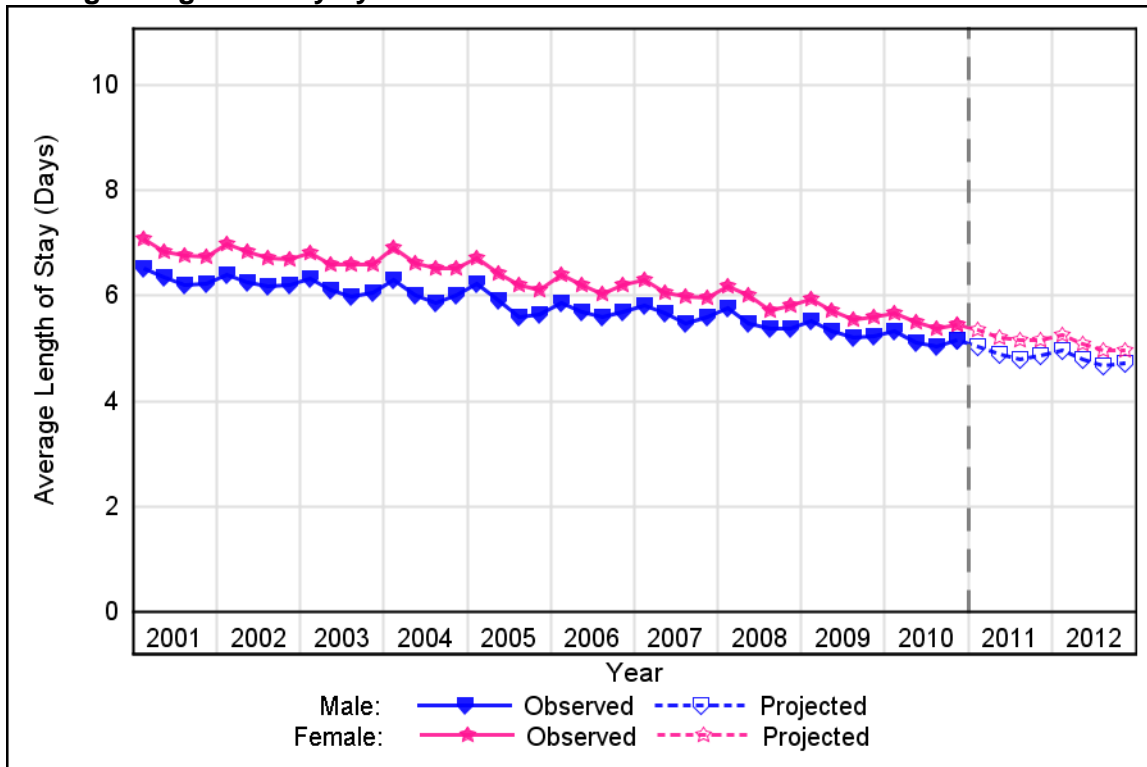


Source: Agency for Healthcare Research and Quality, Center for Delivery, Organization, and Markets, Healthcare Cost and Utilization Project, State Inpatient Databases.

Average Length of Stay by Age



Average Length of Stay by Gender



Source: Agency for Healthcare Research and Quality, Center for Delivery, Organization, and Markets, Healthcare Cost and Utilization Project, State Inpatient Databases.

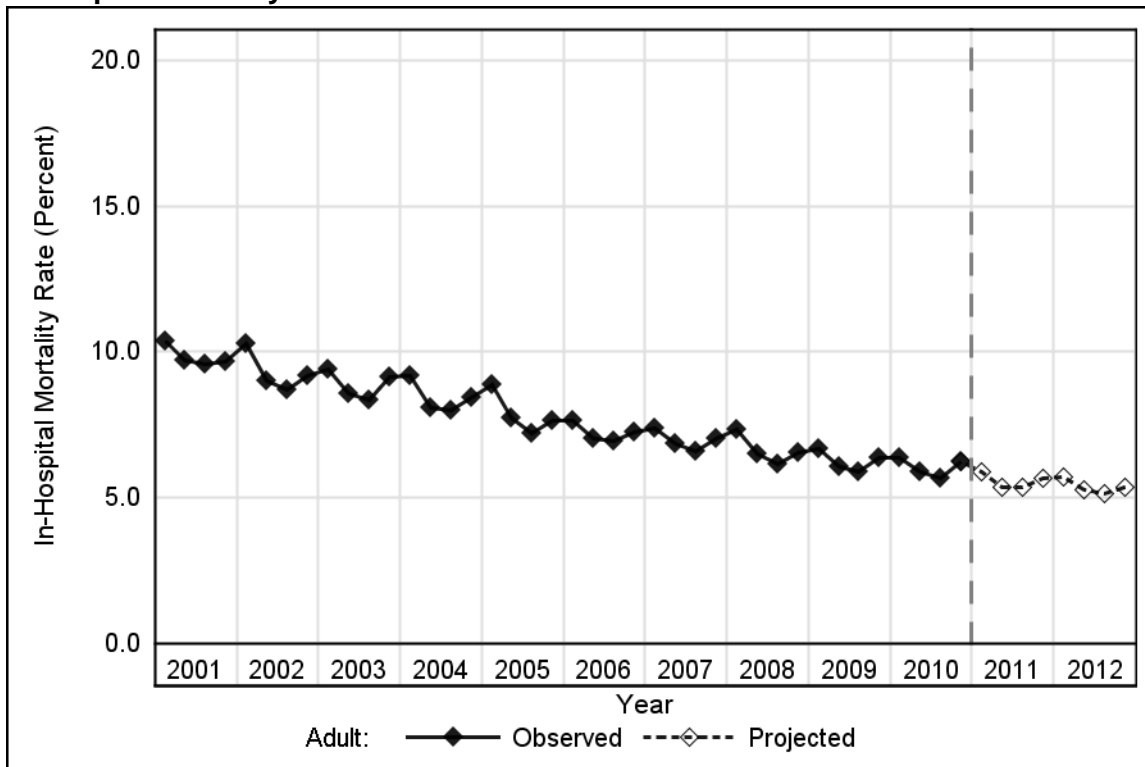
Acute Myocardial Infarction

In-Hospital Mortality Rate

Key Findings:

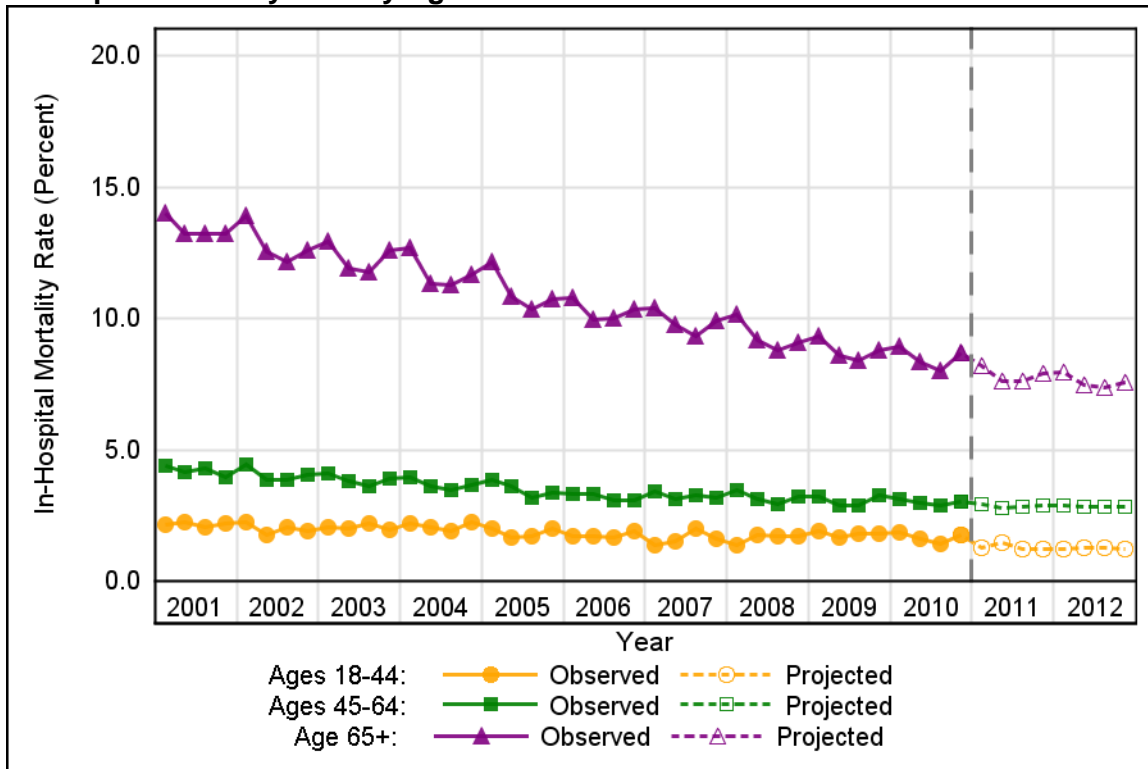
- The mortality rate for discharges with AMI decreased over time, from 9.9 percent in 2001 to 6.1 percent in 2010. This decreasing trend is projected to continue in 2011 and 2012, with the mortality rate projected to be 5.4 percent at the end of 2012.
- Adults age 65 and older had the highest mortality rate, at 13.5 percent in 2001 and decreasing to 8.5 percent in 2010. Adults ages 45 to 64 had the next highest mortality rate, at 4.2 percent in 2001 and decreasing to 3.0 percent in 2010. Adults ages 18 to 44 had the lowest mortality rate, at 2.2 percent in 2001 and decreasing to 1.7 percent in 2010.
- The mortality rate was 2.7 percentage points higher for females than for males. Females had a mortality rate that decreased from 12.0 percent in 2001 to 7.1 percent in 2010. Males had a mortality rate that decreased from 8.3 percent in 2001 to 5.3 percent in 2010.

In-Hospital Mortality Rate for All Adults

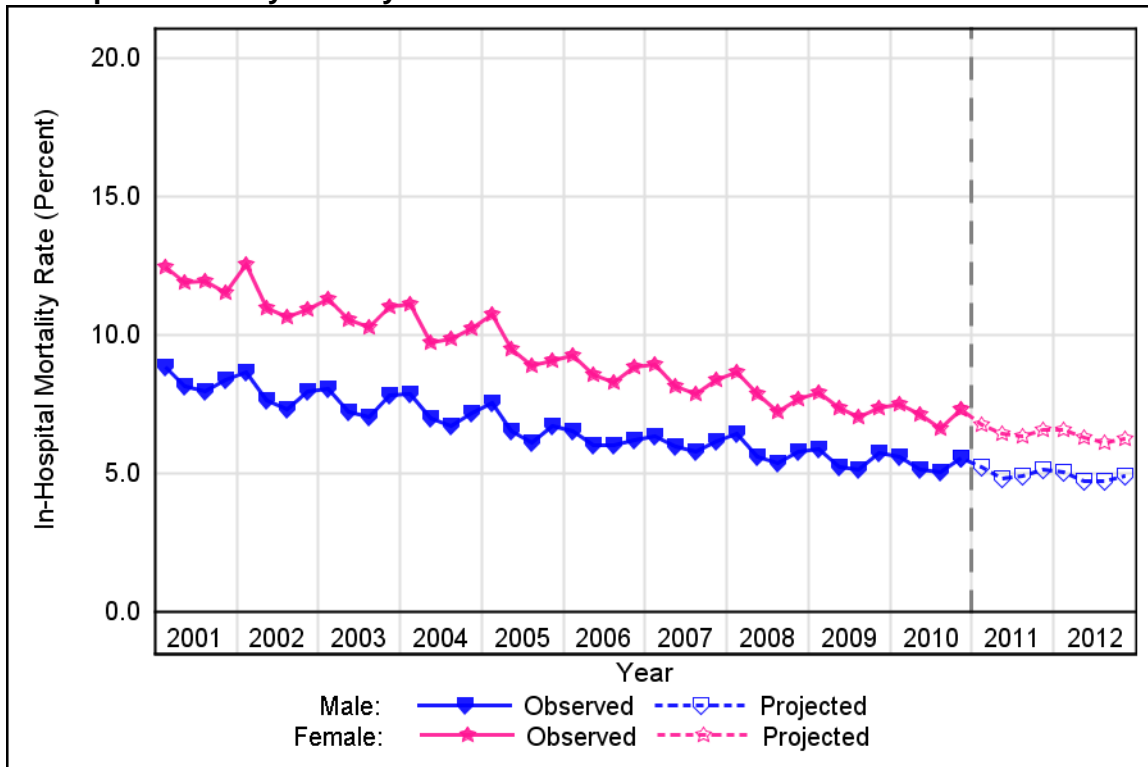


Source: Agency for Healthcare Research and Quality, Center for Delivery, Organization, and Markets, Healthcare Cost and Utilization Project, State Inpatient Databases.

In-Hospital Mortality Rate by Age



In-Hospital Mortality Rate by Gender



Source: Agency for Healthcare Research and Quality, Center for Delivery, Organization, and Markets, Healthcare Cost and Utilization Project, State Inpatient Databases.

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Coronary Artery Disease and Coronary Atherosclerosis

Coronary artery disease (CAD) is the process of plaque buildup in the coronary arteries. Coronary atherosclerosis is the hardening and narrowing of these arteries. Using the HCUP SID from 2001 to 2010 and early 2011 data from 10 States, different outcomes for inpatient discharges with a principal diagnosis of CAD and coronary atherosclerosis are projected for 2011 to 2012.

Projections include the following:

- Total inpatient discharges for all adults, adults by age group, and adults by gender. Discharge counts exclude inpatient stays that were transferred out to another acute care hospital. This ensures that these events are not double counted.
- Average total hospital cost for all adults, adults by age group, and adults by gender. Average total hospital cost reflects actual expenses incurred in the production of hospital services; physician costs are not included. For comparison, a line is included that depicts the change in the average inpatient hospital cost per admission in the first quarter of 2001 (Q1 2001) due solely to economy-wide inflation. The difference between the actual/projected cost line and the inflation-adjusted Q1 2001 cost line represents cost increases due to other non-inflation factors, such as new technology, patient case mix, etc.
- Average length of stay for all adults, adults by age group, and adults by gender. In HCUP, the length of stay counts nights spent in the hospital. If a patient is admitted and discharged on the same day, the length of stay is zero.
- In-hospital mortality rate for all adults, adults by age group, and adults by gender.

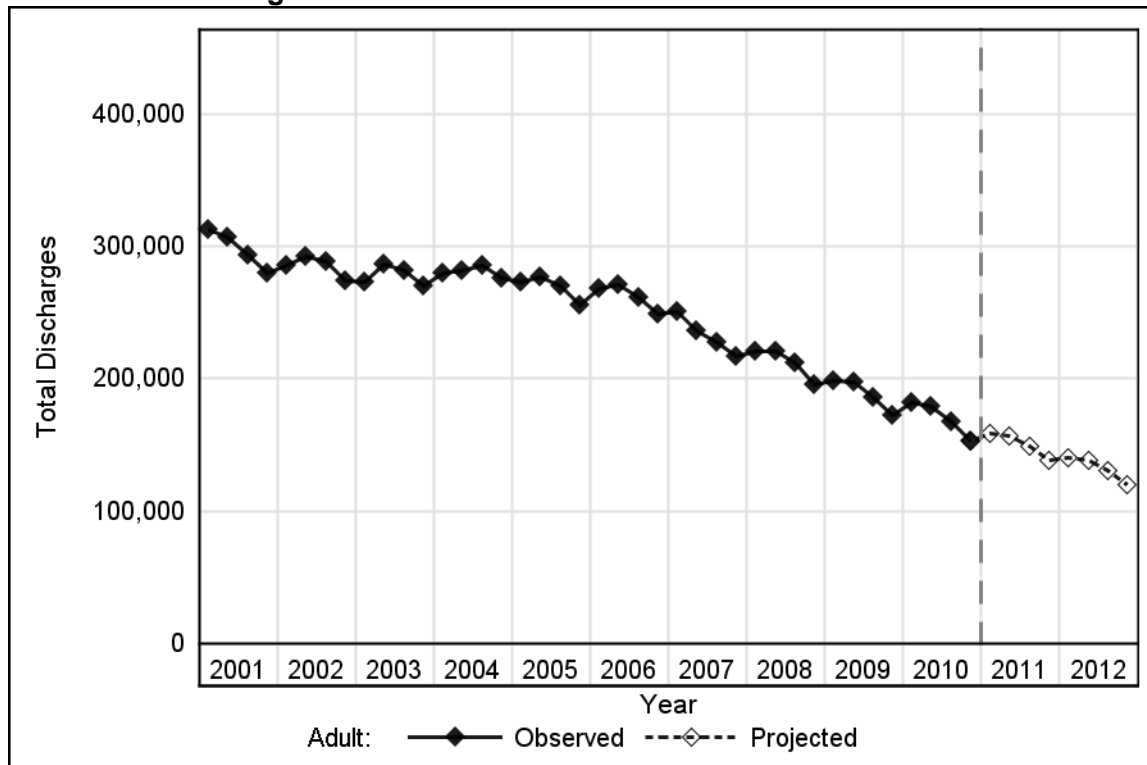
Coronary Artery Disease and Coronary Atherosclerosis

Number of Discharges

Key Findings:

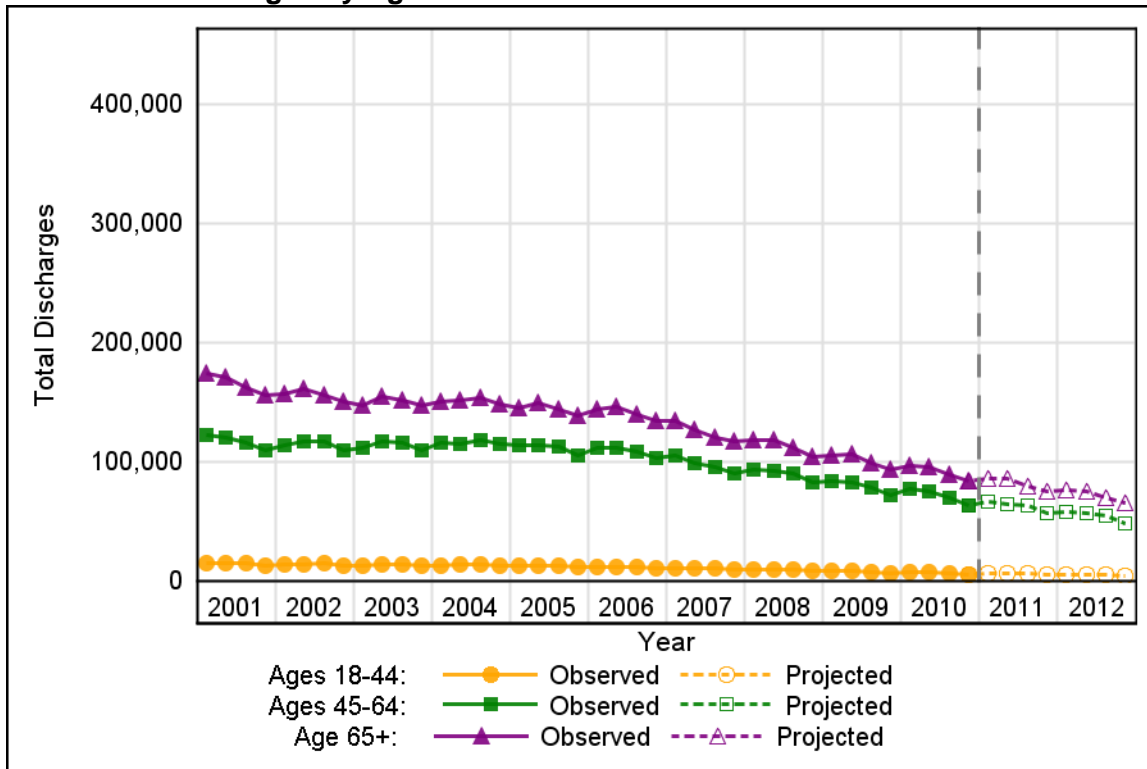
- The number of CAD and coronary atherosclerosis discharges decreased over time, from about 298,000 discharges per quarter in 2001 to 170,000 discharges per quarter in 2010. This decreasing trend is projected to continue in 2011 and 2012, with quarterly discharges projected to be about 120,000 at the end of 2012.
- Adults age 65 and older had the highest discharges, at about 166,000 discharges per quarter in 2001 and decreasing to 91,500 discharges per quarter in 2010. Adults ages 45 to 64 had the next highest discharges, at about 117,000 discharges per quarter in 2001 and decreasing to 71,500 discharges in 2010. Adults ages 18 to 44 had the lowest discharges, decreasing from about 14,500 discharges per quarter in 2001 to 7,000 discharges per quarter in 2010.
- Males had about 59,500 more discharges per quarter than did females. Males had about 180,000 discharges per quarter in 2001, decreasing to 108,500 discharges per quarter in 2010. Females had about 118,000 discharges per quarter in 2001, decreasing to 62,000 discharges per quarter in 2010.

Number of Discharges for All Adults

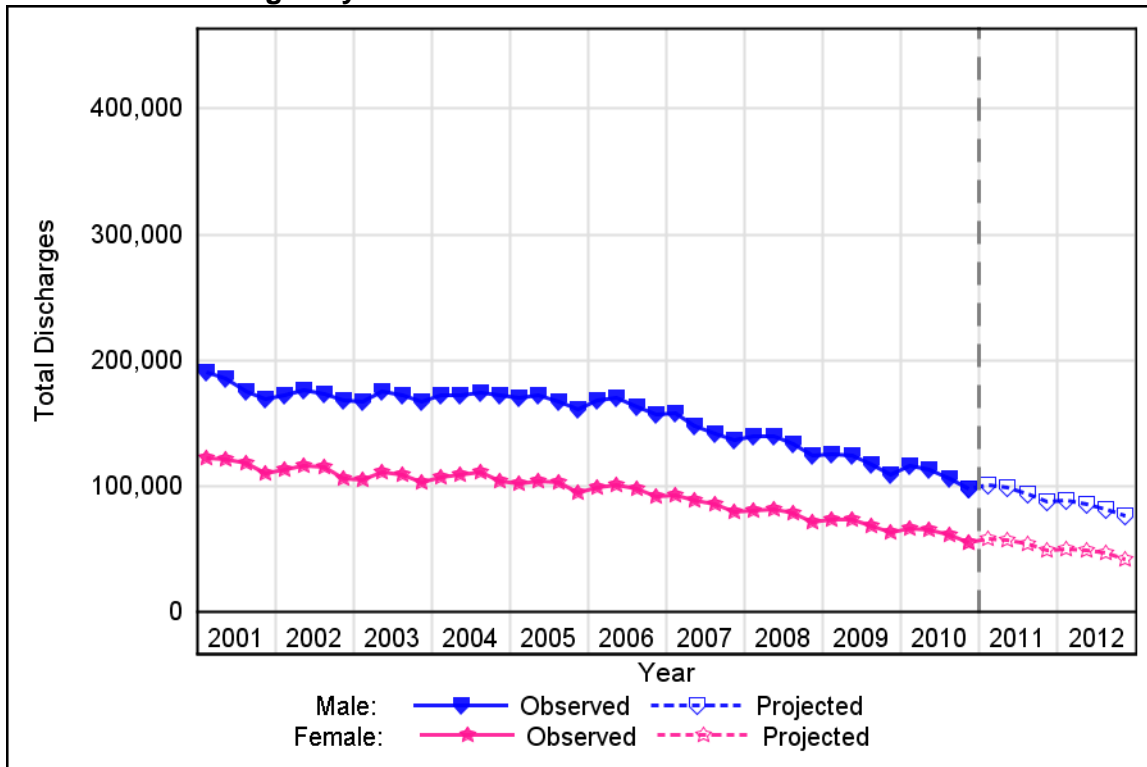


Source: Agency for Healthcare Research and Quality, Center for Delivery, Organization, and Markets, Healthcare Cost and Utilization Project, State Inpatient Databases.

Number of Discharges by Age



Number of Discharges by Gender



Source: Agency for Healthcare Research and Quality, Center for Delivery, Organization, and Markets, Healthcare Cost and Utilization Project, State Inpatient Databases.

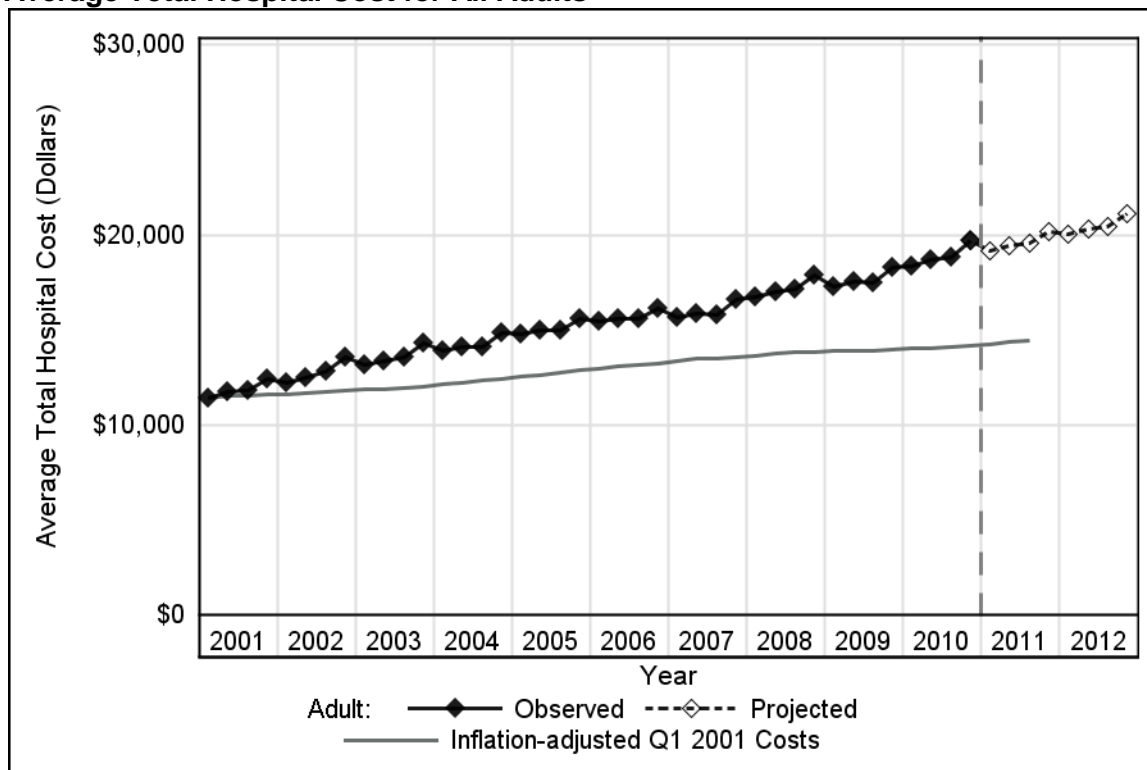
Coronary Artery Disease and Coronary Atherosclerosis

Average Total Hospital Cost

Key Findings:

- The average hospital cost for discharges with CAD and coronary atherosclerosis increased over time, from about \$12,000 in 2001 to \$19,000 in 2010. This increasing trend is projected to continue in 2011 and 2012, with the average hospital cost projected to be about \$21,000 at the end of 2012.
- The average hospital cost was similar for the two older age groups, increasing from about \$12,000 in 2001 to \$19,000 in 2010. The average hospital cost for adults ages 18 to 44 was lower than for the two older age groups but also exhibited an increasing trend, from about \$9,500 in 2001 to \$15,000 in 2010.
- The average hospital cost was about \$2,000 higher for males than for females. Males had an average hospital cost that increased from about \$12,500 in 2001 to \$20,000 in 2010. Females had an average hospital cost that increased from about \$11,000 in 2001 to \$17,000 in 2010.
- Using the Gross Domestic Product (GDP) price index, a cost of \$12,000 in 2001 would be equivalent to a cost of \$15,000 in 2010. By 2010, the average hospital cost exceeded the cost expected by inflation alone.

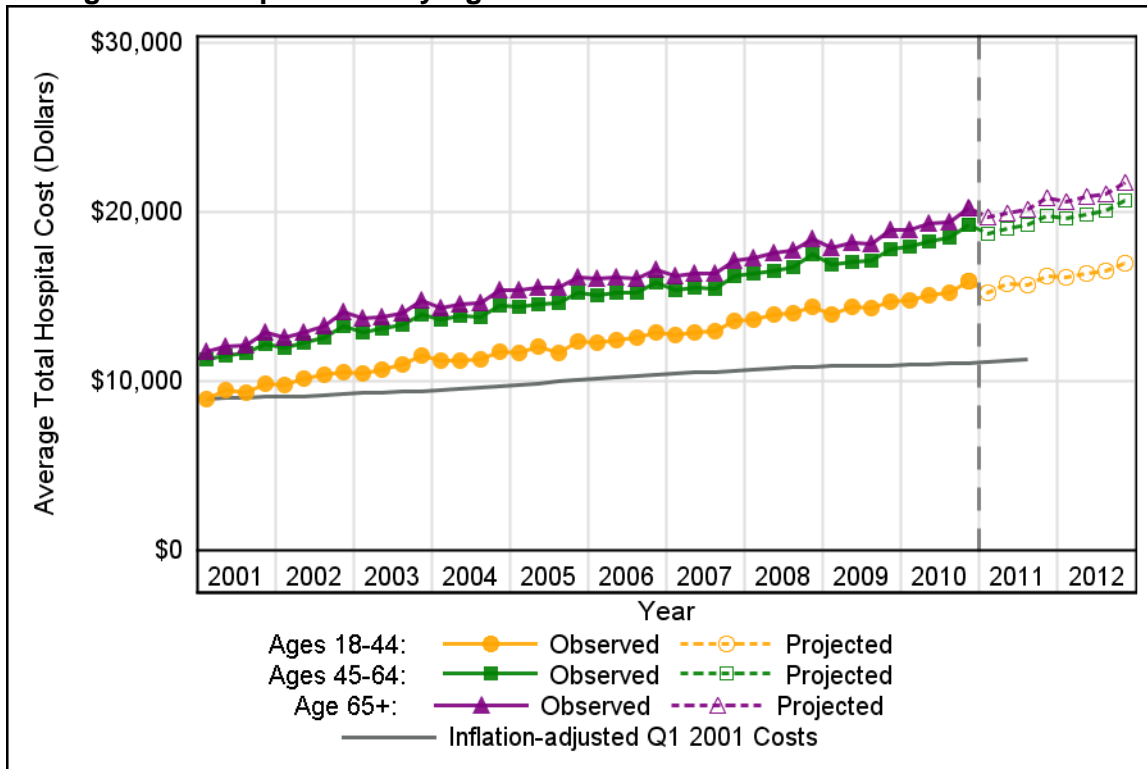
Average Total Hospital Cost for All Adults



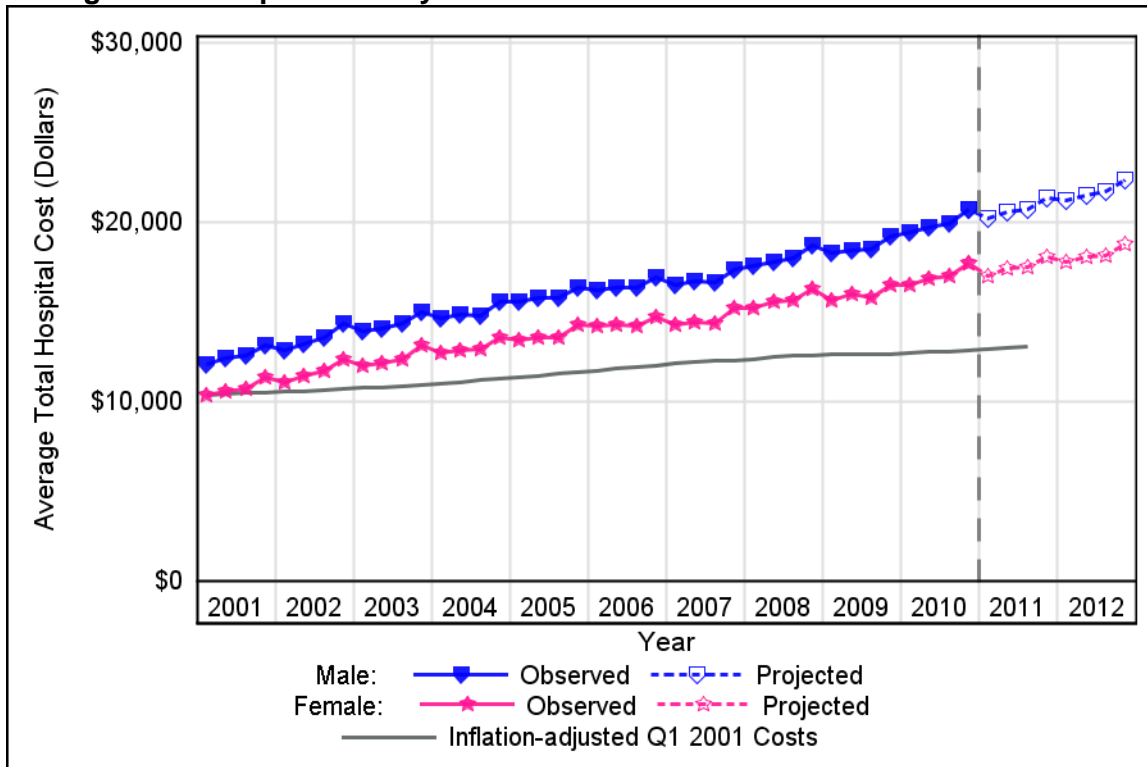
Inflation-adjusted Q1 2001 Costs: Cost per admission in the first quarter of 2001, adjusted for economy-wide inflation.

Source: Agency for Healthcare Research and Quality, Center for Delivery, Organization, and Markets, Healthcare Cost and Utilization Project, State Inpatient Databases.

Average Total Hospital Cost by Age



Average Total Hospital Cost by Gender



Inflation-adjusted Q1 2001 Costs: Cost per admission in the first quarter of 2001, adjusted for economy-wide inflation. Source: Agency for Healthcare Research and Quality, Center for Delivery, Organization, and Markets, Healthcare Cost and Utilization Project, State Inpatient Databases.

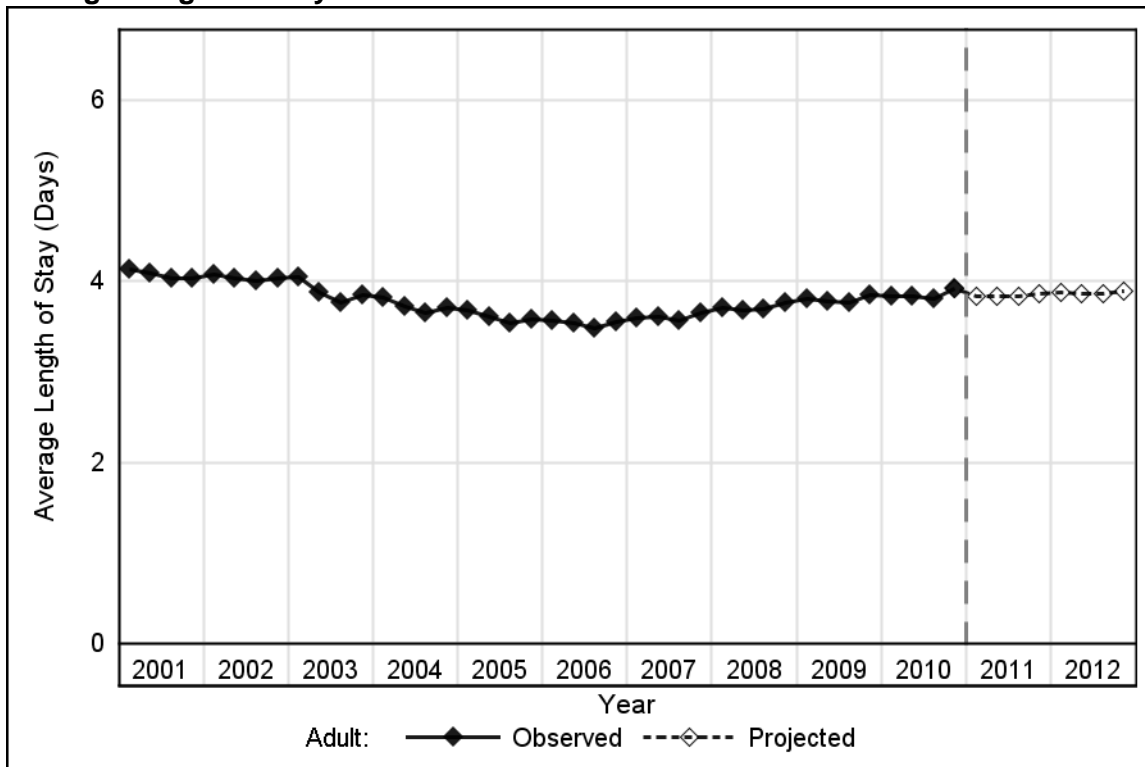
Coronary Artery Disease and Coronary Atherosclerosis

Average Length of Stay

Key Findings:

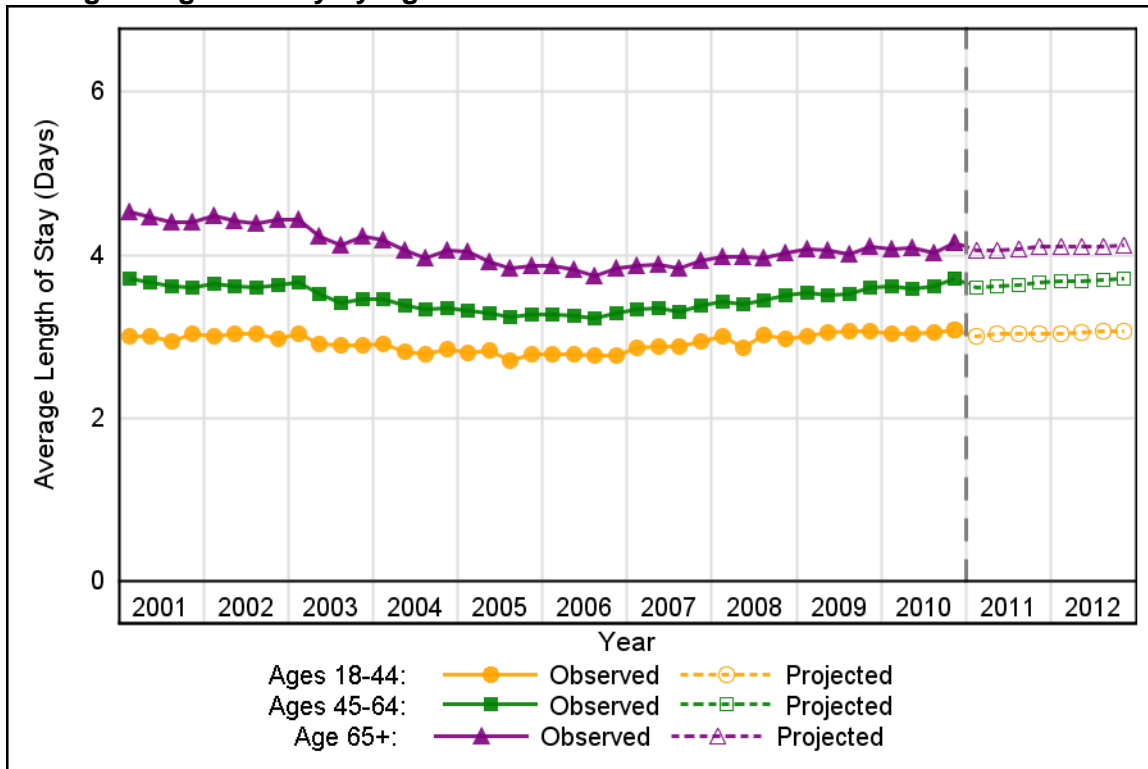
- The length of stay for discharges with CAD and coronary atherosclerosis decreased from 4.1 days in 2001 to 3.6 days in 2006, and then gradually increased beginning in 2007. Length of stay is projected to be 3.9 days in 2012.
- Adults age 65 and older had the highest length of stay, at 4.5 days in 2001, decreasing to 3.8 days in 2006, and increasing slightly to 4.1 days in 2010. Adults ages 45 to 64 had the next highest length of stay, at 3.7 days in 2001, decreasing to 3.3 days in 2006, and increasing slightly to 3.6 days in 2010. Adults ages 18 to 44 had the lowest length of stay, remaining relatively stable at 2.9 days between 2001 and 2010.
- Length of stay was similar for males and females, at 4.1 days in 2001, decreasing to 3.5 days in 2006, and increasing slightly to 3.9 days in 2010.

Average Length of Stay for All Adults

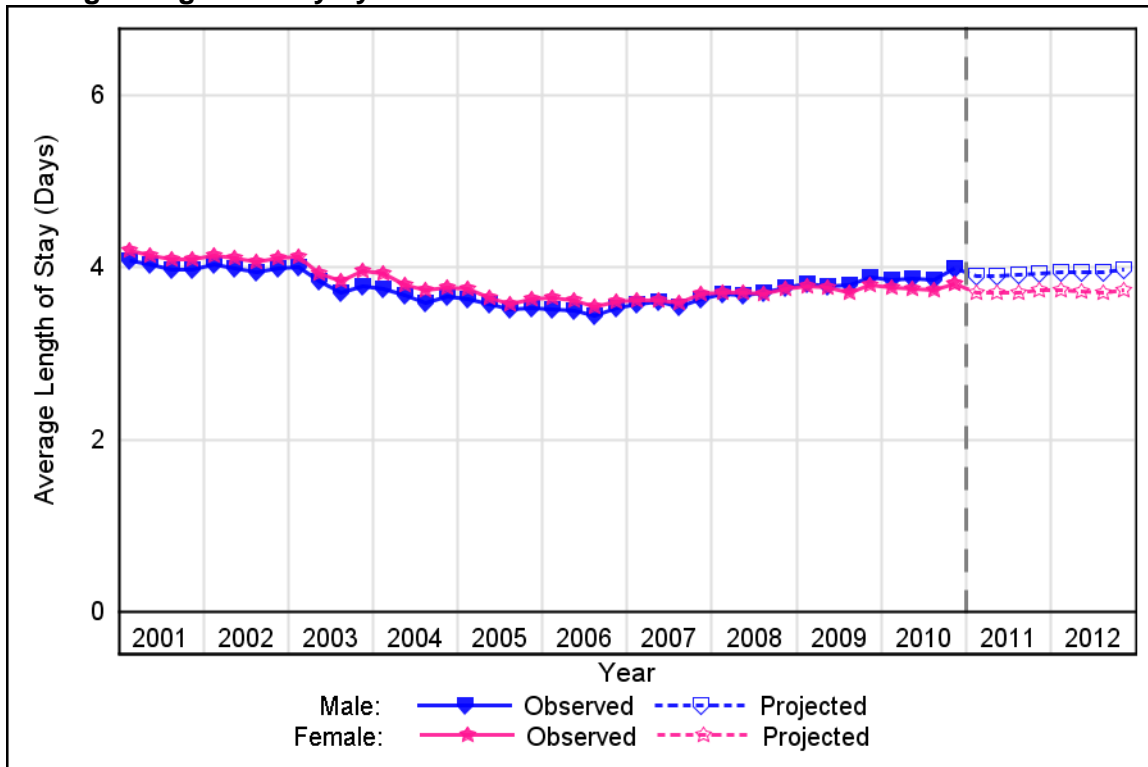


Source: Agency for Healthcare Research and Quality, Center for Delivery, Organization, and Markets, Healthcare Cost and Utilization Project, State Inpatient Databases.

Average Length of Stay by Age



Average Length of Stay by Gender



Source: Agency for Healthcare Research and Quality, Center for Delivery, Organization, and Markets, Healthcare Cost and Utilization Project, State Inpatient Databases.

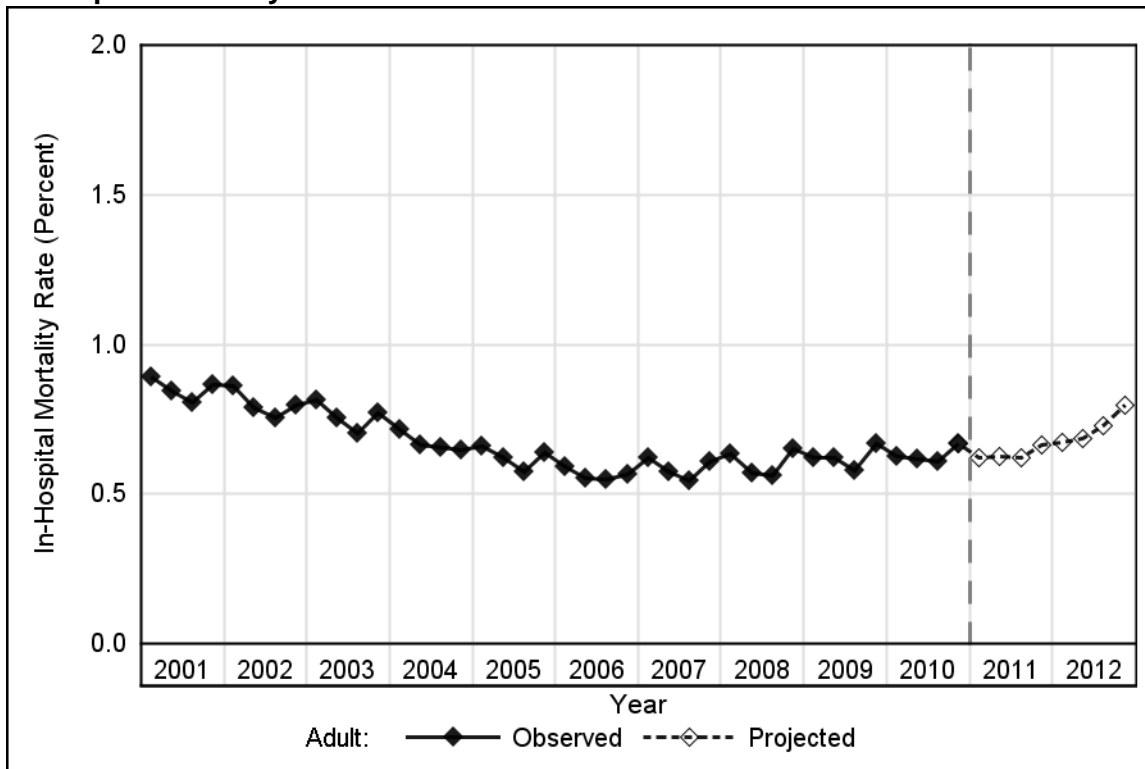
Coronary Artery Disease and Coronary Atherosclerosis

In-Hospital Mortality Rate

Key Findings:

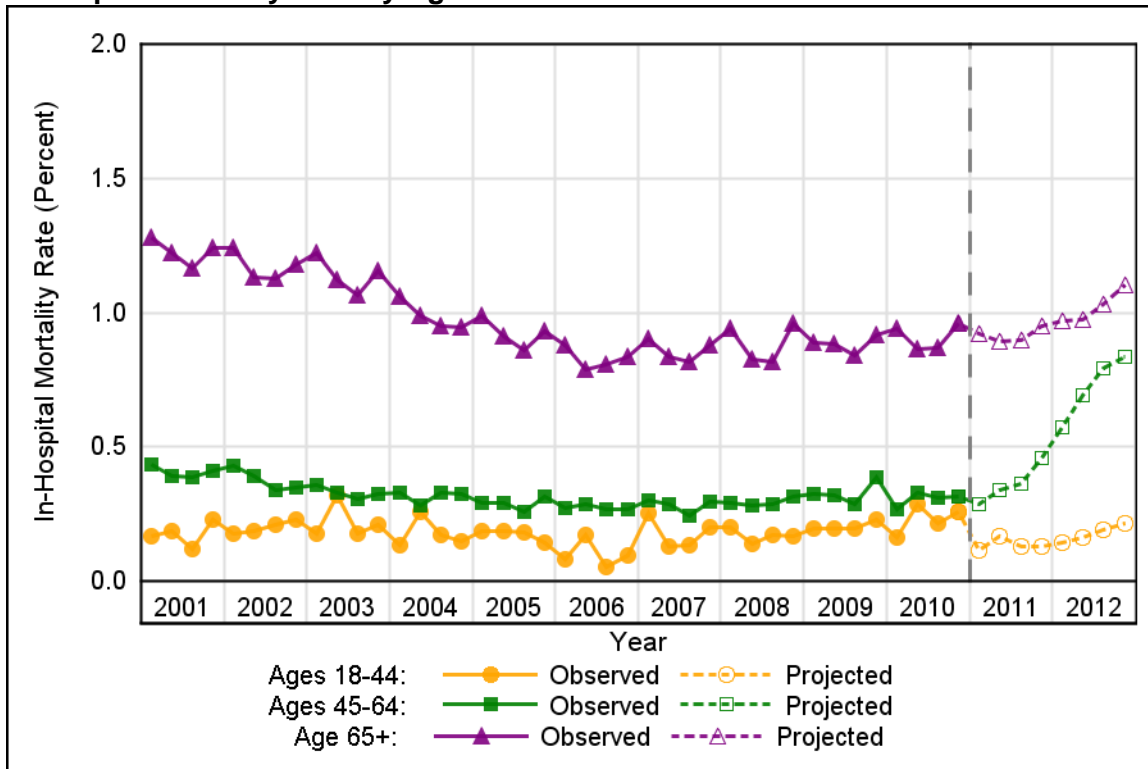
- The mortality rate for discharges with CAD and coronary atherosclerosis decreased over time, from 0.9 percent in 2001 to 0.6 percent in 2010. The mortality rate is projected to increase slightly to 0.7 percent in 2012.
- Adults age 65 and older had the highest mortality rate, at 1.2 percent in 2001 and decreasing to 0.9 percent in 2010. Adults ages 45 to 64 had the next highest mortality rate, at 0.4 percent in 2001 and decreasing to 0.3 percent in 2010. Adults ages 18 to 44 had the lowest mortality rate, remaining relatively stable at 0.2 percent between 2001 and 2010.
- The mortality rate was 0.1 percentage point higher for females than for males. Females had a mortality rate that decreased from 1.0 percent in 2001 to 0.7 percent in 2010. Males had a mortality rate that decreased from 0.8 percent in 2001 to 0.6 percent in 2010.

In-Hospital Mortality Rate for All Adults

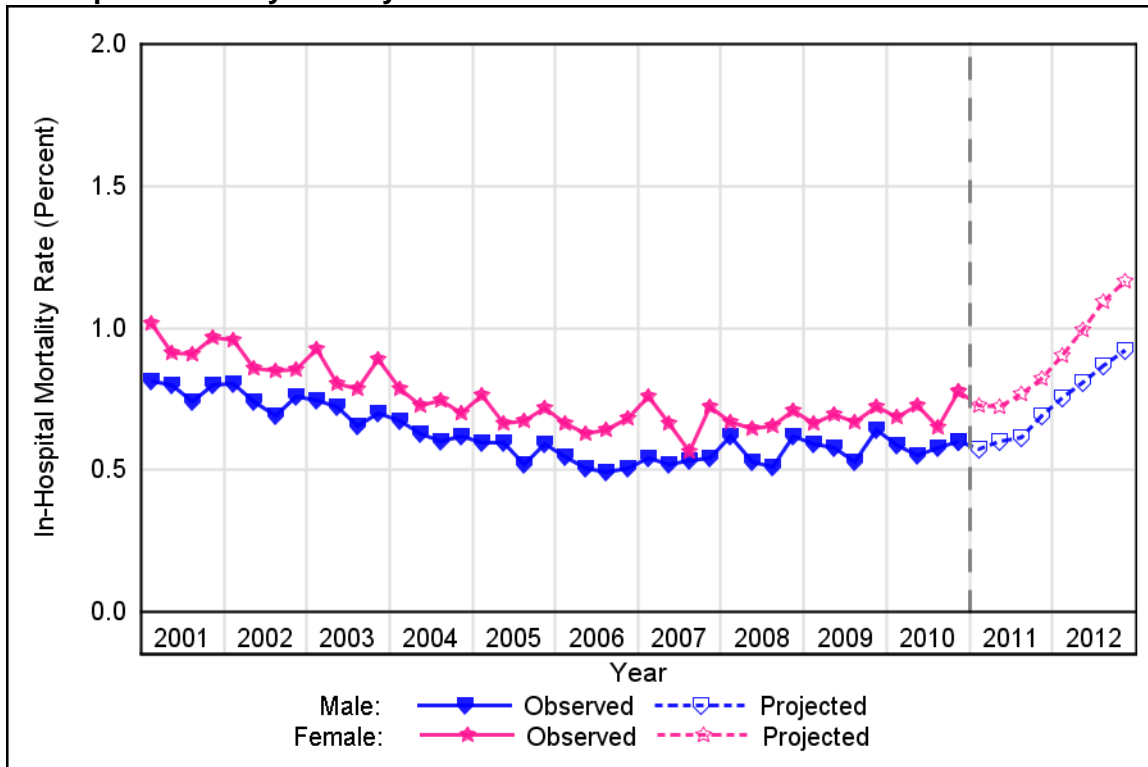


Source: Agency for Healthcare Research and Quality, Center for Delivery, Organization, and Markets, Healthcare Cost and Utilization Project, State Inpatient Databases.

In-Hospital Mortality Rate by Age



In-Hospital Mortality Rate by Gender



Source: Agency for Healthcare Research and Quality, Center for Delivery, Organization, and Markets, Healthcare Cost and Utilization Project, State Inpatient Databases.

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Congestive Heart Failure

Congestive heart failure (CHF) occurs when the heart is no longer able to pump enough oxygen-rich blood out to the rest of the body, especially when the person is exercising or active. As the heart's pumping action is lost, blood may back up in other areas of the body. Fluid builds up in the lungs, liver, gastrointestinal tract, and the arms and legs. This is called congestive heart failure. Using the HCUP SID from 2001 to 2010 and early 2011 data from 10 States, different outcomes for inpatient discharges with a principal diagnosis of CHF are projected for 2011 to 2012.

Projections include the following:

- Total inpatient discharges for all adults, adults by age group, and adults by gender. Discharge counts exclude inpatient stays that were transferred out to another acute care hospital. This ensures that these events are not double counted.
- Average total hospital cost for all adults, adults by age group, and adults by gender. Average total hospital cost reflects actual expenses incurred in the production of hospital services; physician costs are not included. For comparison, a line is included that depicts the change in the average inpatient hospital cost per admission in the first quarter of 2001 (Q1 2001) due solely to economy-wide inflation. The difference between the actual/projected cost line and the inflation-adjusted Q1 2001 cost line represents cost increases due to other non-inflation factors, such as new technology, patient case mix, etc.
- Average length of stay for all adults, adults by age group, and adults by gender. In HCUP, the length of stay counts nights spent in the hospital. If a patient is admitted and discharged on the same day, the length of stay is zero.
- In-hospital mortality rate for all adults, adults by age group, and adults by gender.

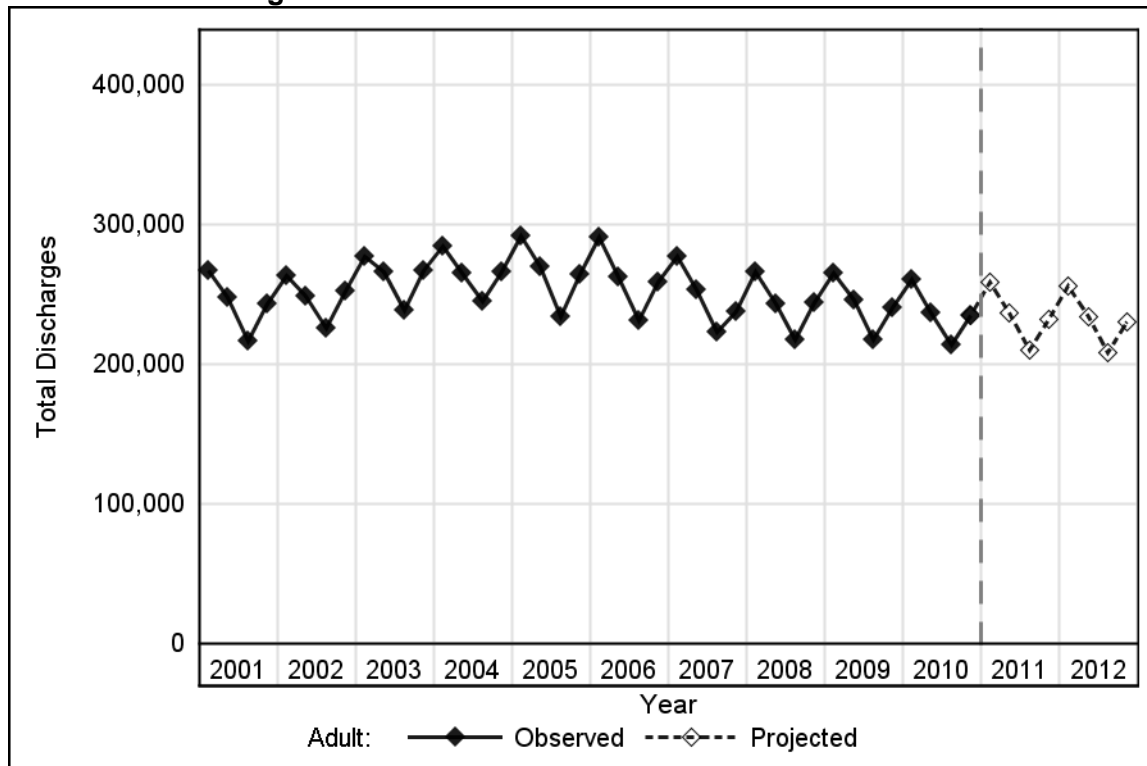
Congestive Heart Failure

Number of Discharges

Key Findings:

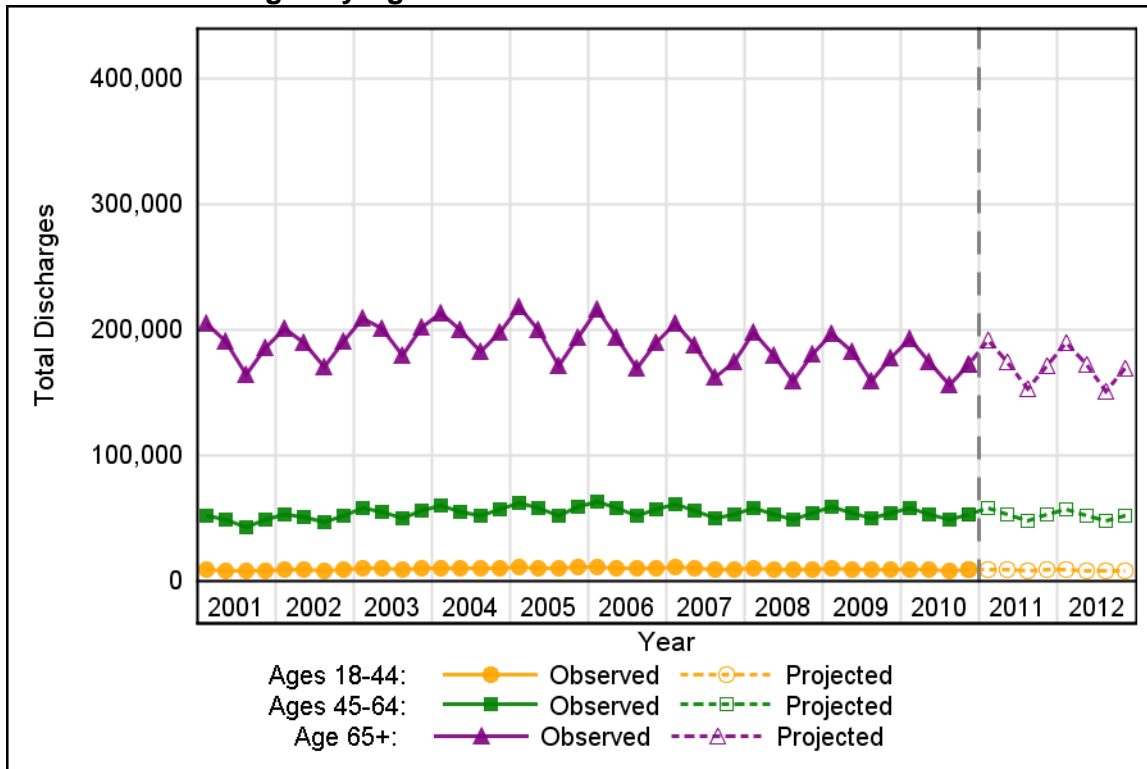
- The number of CHF discharges vacillated around 251,500 discharges per quarter between 2001 and 2010, gradually decreasing from a high of 265,000 discharges in 2004 to 236,500 discharges in 2010. Discharges are projected to vacillate around 232,000 in 2012.
- Adults age 65 and older had the highest discharges, decreasing from a high of 198,500 discharges in 2004 to 174,000 discharges in 2010. Adults ages 45 to 64 had the next highest discharges, increasing from about 48,500 discharges per quarter in 2001 to 58,000 discharges in 2005 and then remaining relatively stable through 2010. Adults ages 18 to 44 had the lowest discharges, increasing from about 8,500 discharges per quarter in 2001 to 11,000 discharges in 2005 and then decreasing to 9,000 discharges in 2010.
- Females had about 24,000 more discharges per quarter in 2001 than did males, but this initial difference disappeared over time. Females decreased from a high of 141,000 discharges in 2003 to 119,500 discharges in 2010. Males vacillated around 120,000 discharges per quarter between 2001 and 2010.

Number of Discharges for All Adults

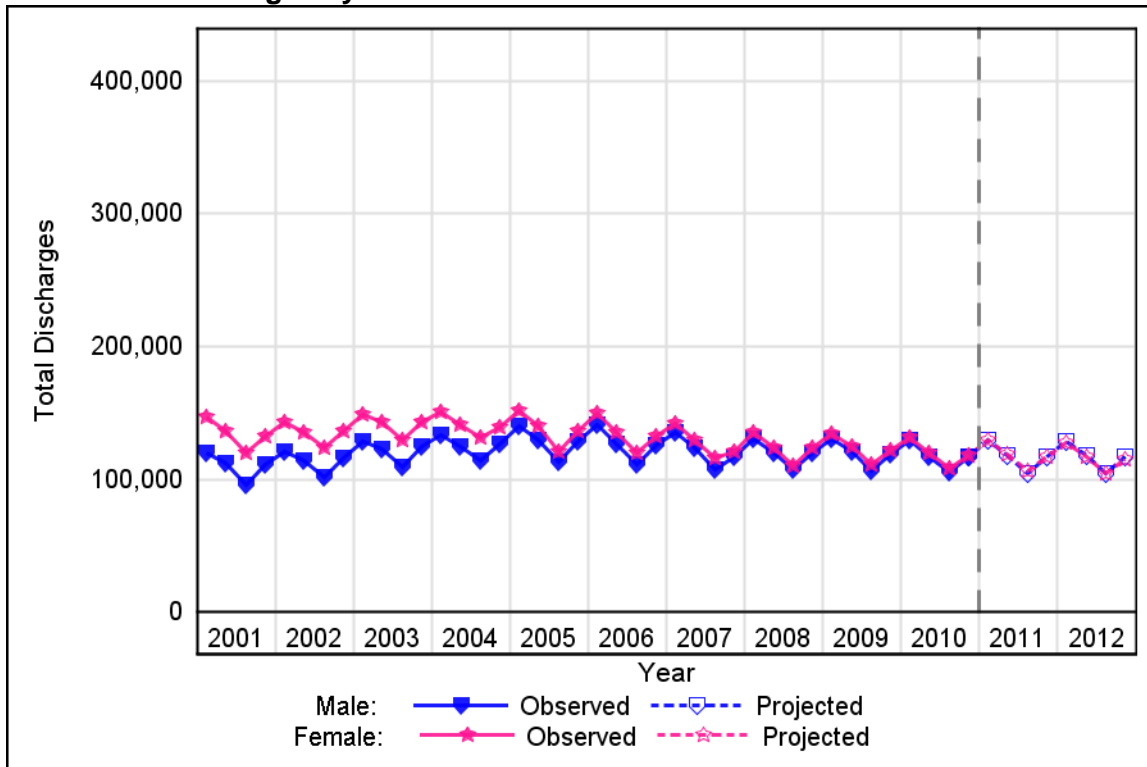


Source: Agency for Healthcare Research and Quality, Center for Delivery, Organization, and Markets, Healthcare Cost and Utilization Project, State Inpatient Databases.

Number of Discharges by Age



Number of Discharges by Gender



Source: Agency for Healthcare Research and Quality, Center for Delivery, Organization, and Markets, Healthcare Cost and Utilization Project, State Inpatient Databases.

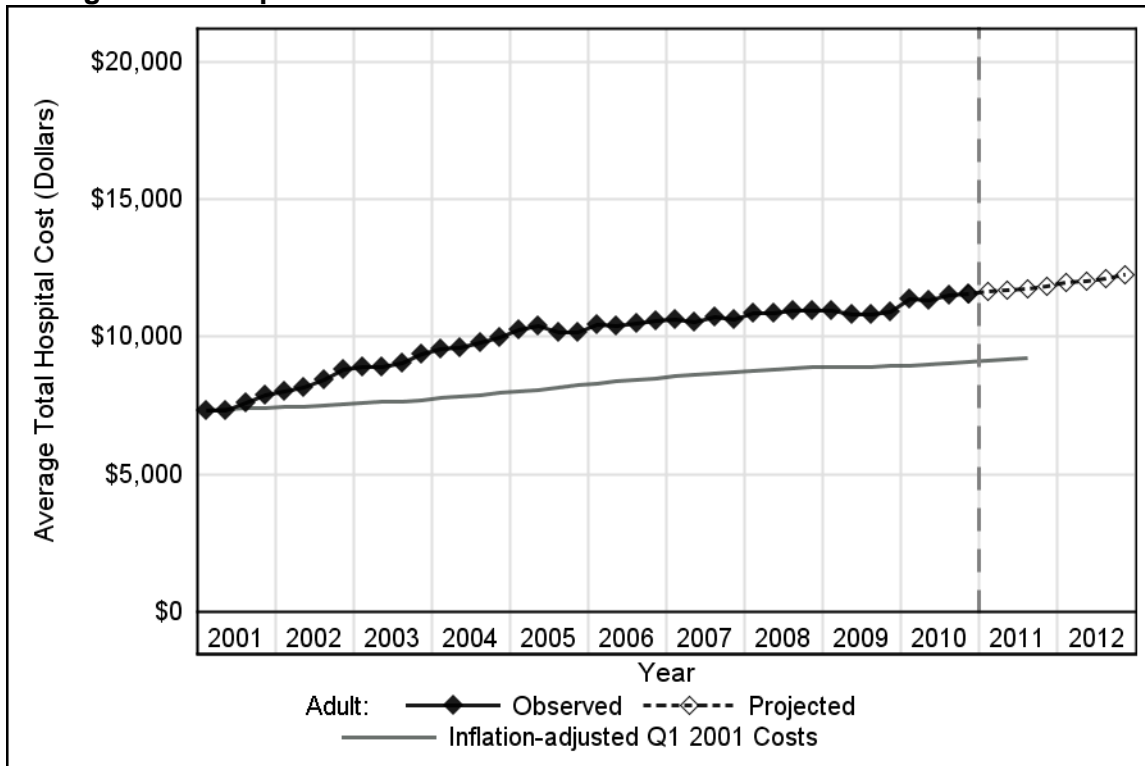
Congestive Heart Failure

Average Total Hospital Cost

Key Findings:

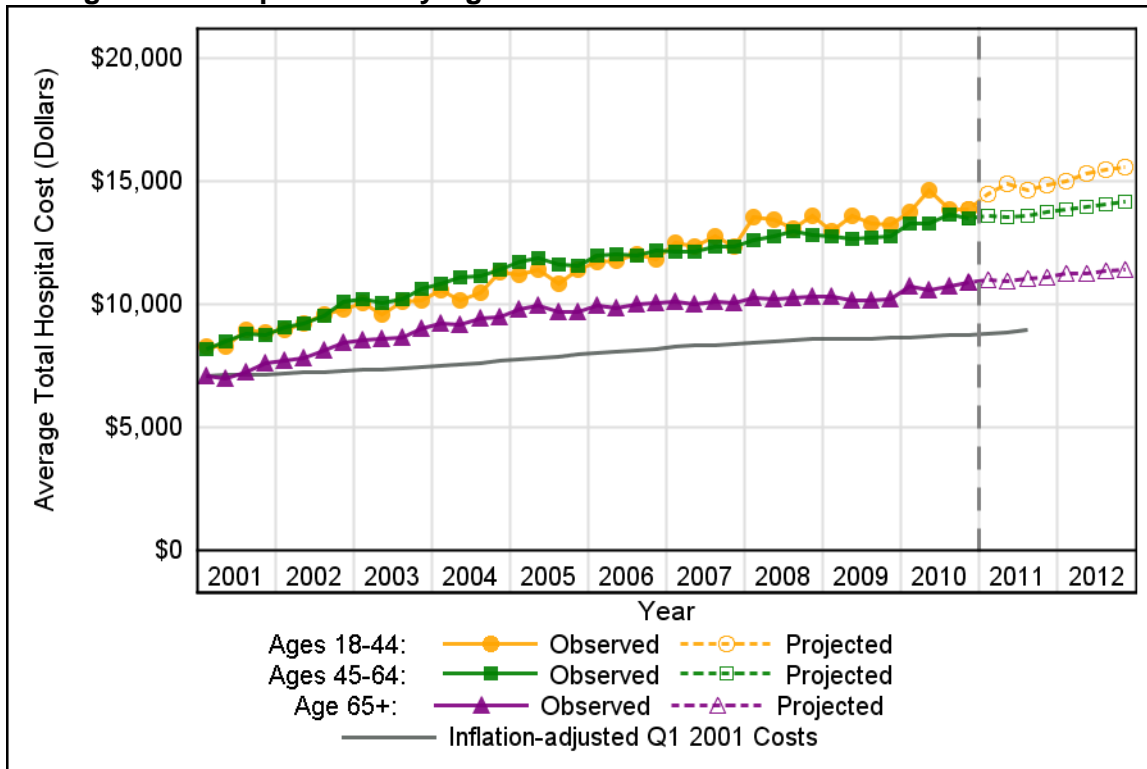
- The average hospital cost for discharges with CHF increased from about \$7,500 in 2001 to \$11,500 in 2010. The average hospital cost is projected to continue to increase slightly in 2011 and 2012 to about \$12,000 at the end of 2012.
- The two youngest age groups had similar average hospital cost, increasing from about \$8,500 in 2001 to \$13,500 in 2010. Adults age 65 and older had the lowest average hospital cost, increasing from about \$7,000 in 2001 to \$10,500 in 2010.
- The average hospital cost was about \$1,500 higher for males than for females. Males had an average hospital cost that increased from about \$8,000 in 2001 to \$12,500 in 2010. Females had an average hospital cost that increased from about \$7,000 in 2001 to \$10,500 in 2010.
- Using the Gross Domestic Product (GDP) price index, a cost of \$7,500 in 2001 would be equivalent to a cost of \$9,500 in 2010. By 2010, the average hospital cost exceeded the cost expected by inflation alone.

Average Total Hospital Cost for All Adults

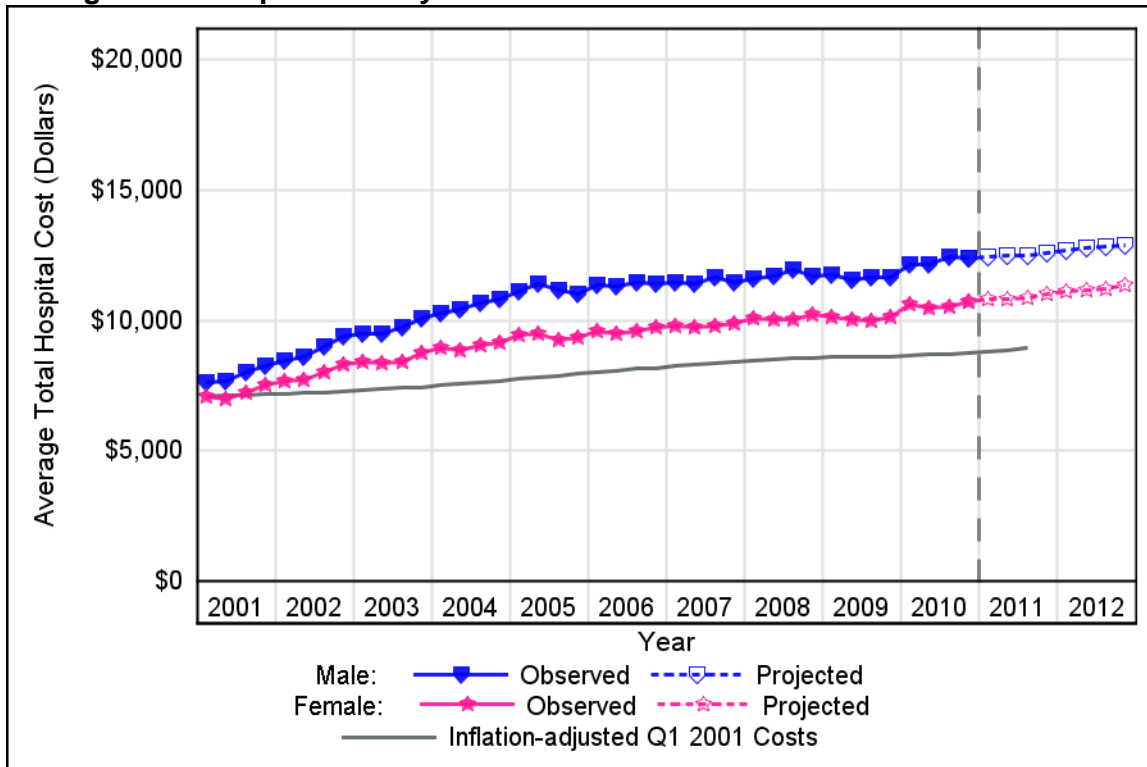


Inflation-adjusted Q1 2001 Costs: Cost per admission in the first quarter of 2001, adjusted for economy-wide inflation.
Source: Agency for Healthcare Research and Quality, Center for Delivery, Organization, and Markets, Healthcare Cost and Utilization Project, State Inpatient Databases.

Average Total Hospital Cost by Age



Average Total Hospital Cost by Gender



Inflation-adjusted Q1 2001 Costs: Cost per admission in the first quarter of 2001, adjusted for economy-wide inflation. Source: Agency for Healthcare Research and Quality, Center for Delivery, Organization, and Markets, Healthcare Cost and Utilization Project, State Inpatient Databases.

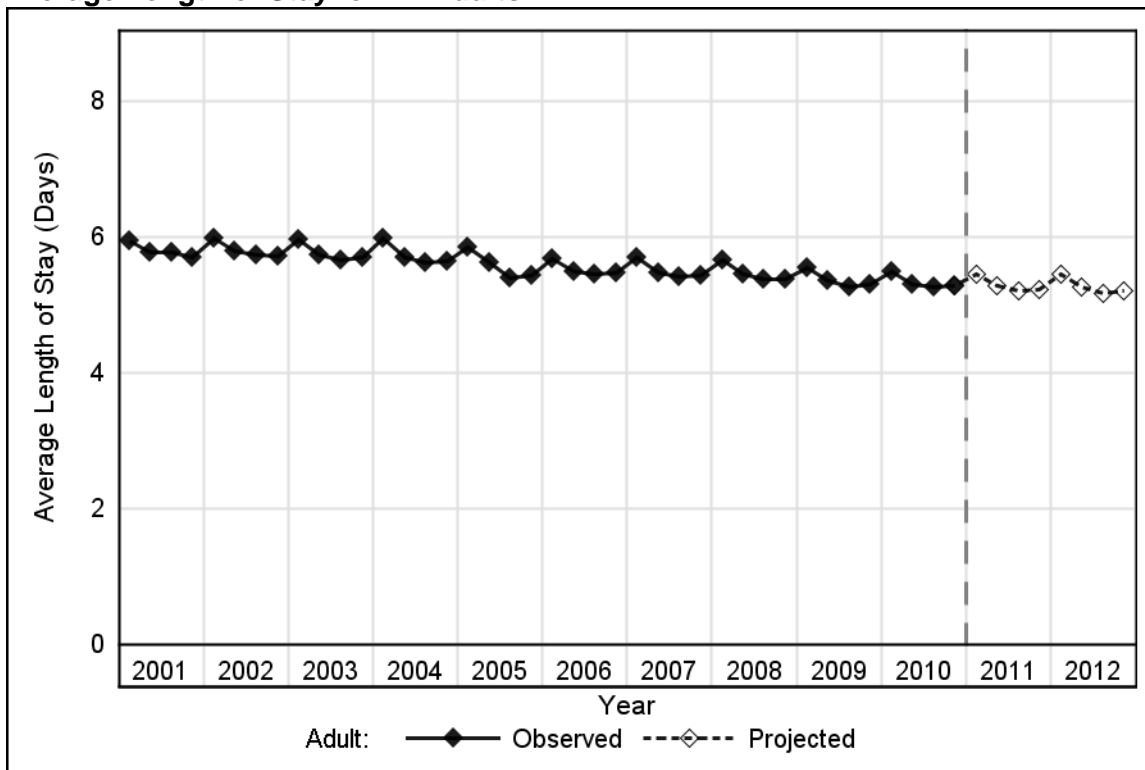
Congestive Heart Failure

Average Length of Stay

Key Findings:

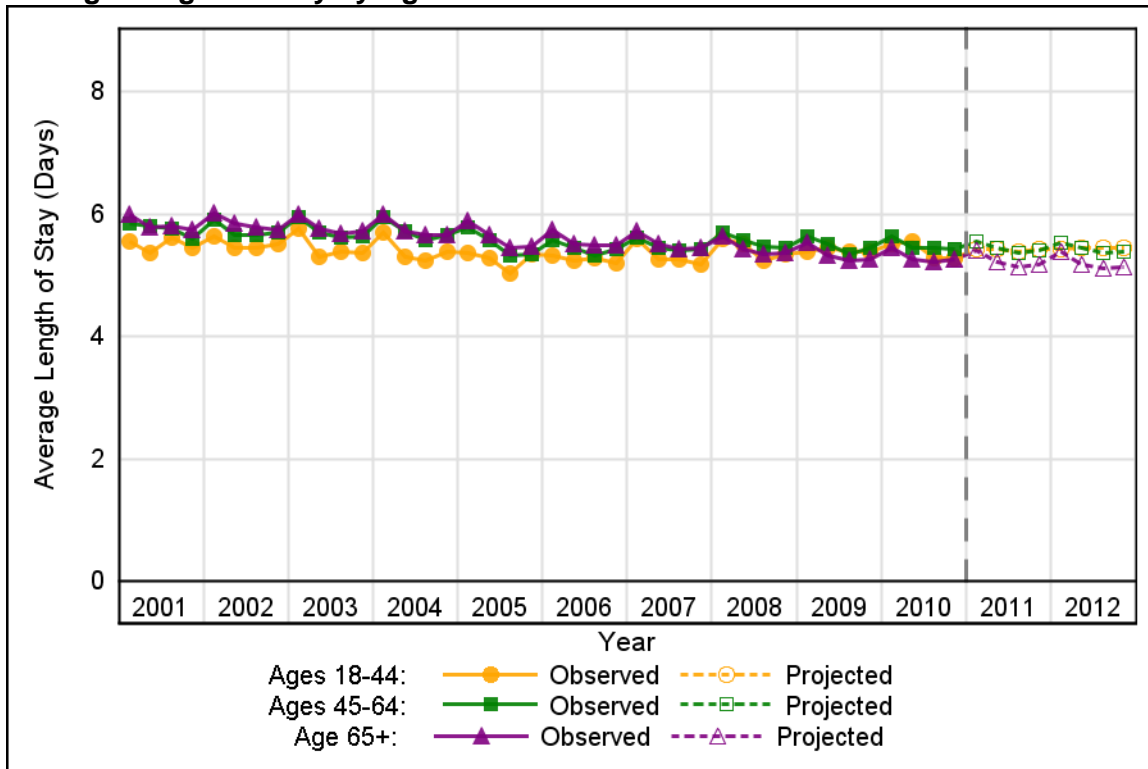
- The length of stay for discharges with CHF was relatively stable between 2001 and 2010 at 5.6 days. Length of stay is projected to decrease slightly to 5.3 days in 2011 and 2012.
- Length of stay was similar for all three age groups, remaining relatively stable between 2001 and 2010 at 5.5 days.
- Length of stay was similar for males and females, remaining relatively stable at 5.6 days.

Average Length of Stay for All Adults

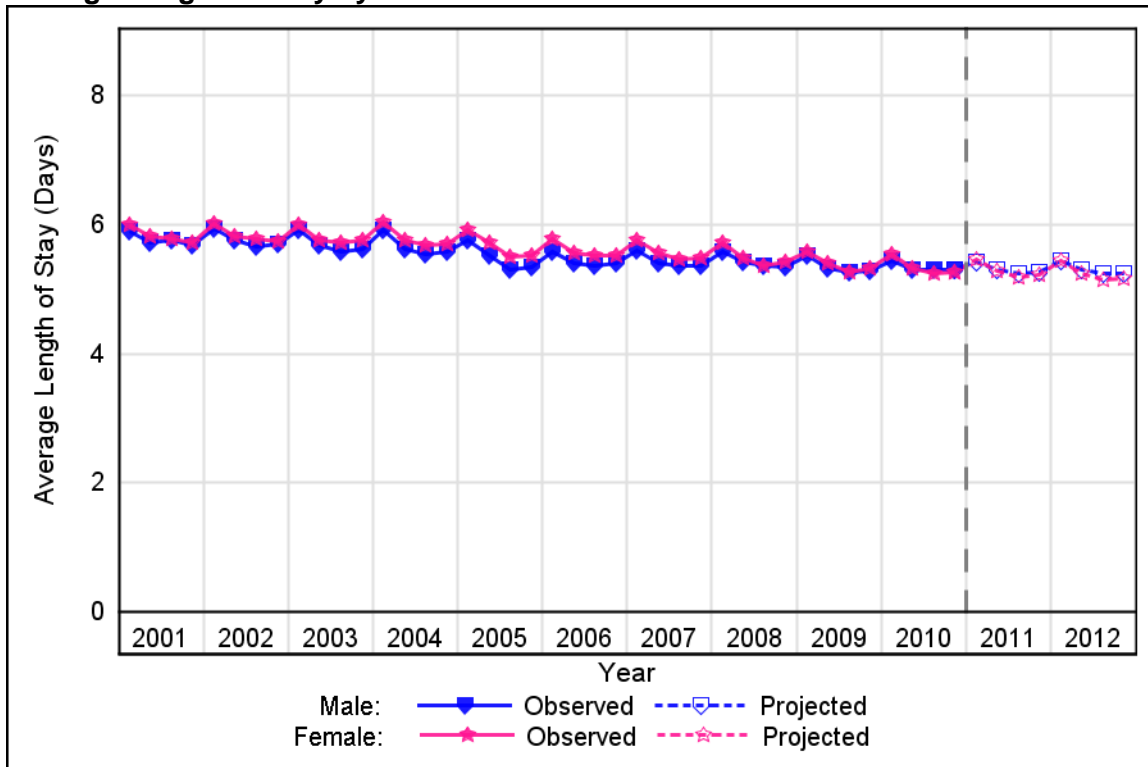


Source: Agency for Healthcare Research and Quality, Center for Delivery, Organization, and Markets, Healthcare Cost and Utilization Project, State Inpatient Databases.

Average Length of Stay by Age



Average Length of Stay by Gender



Source: Agency for Healthcare Research and Quality, Center for Delivery, Organization, and Markets, Healthcare Cost and Utilization Project, State Inpatient Databases.

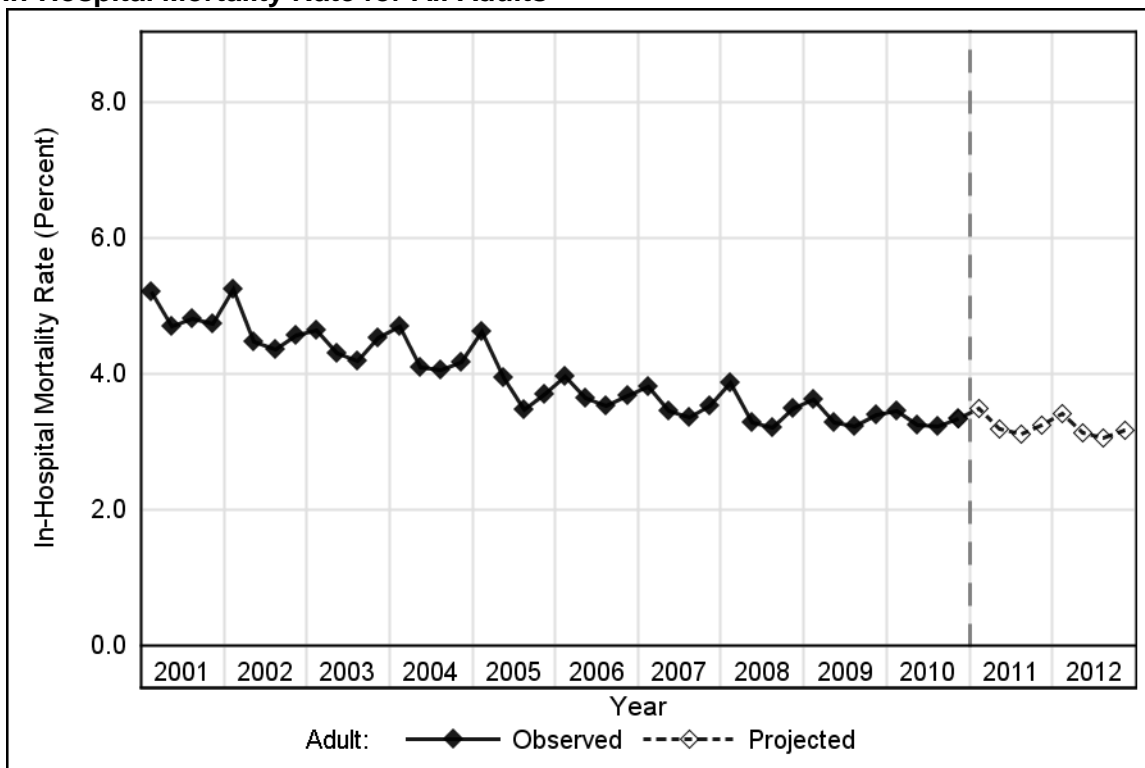
Congestive Heart Failure

In-Hospital Mortality Rate

Key Findings:

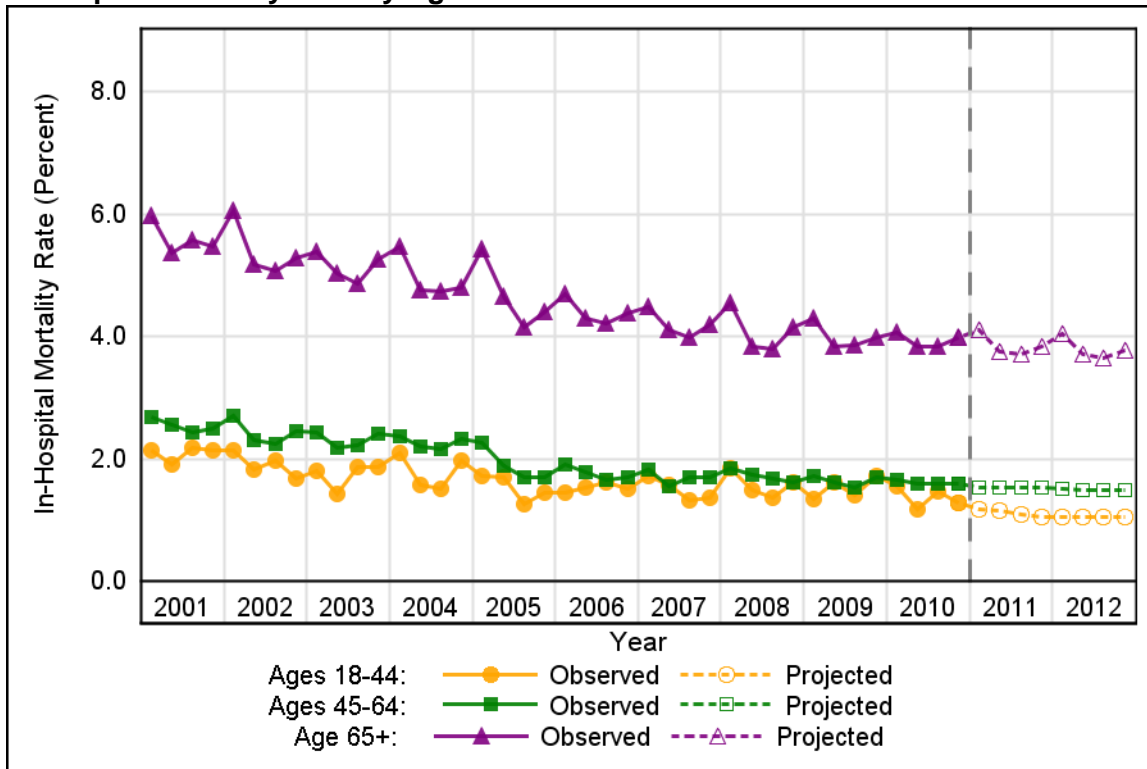
- The mortality rate for discharges with CHF decreased over time, from 4.9 percent in 2001 to 3.3 percent in 2010. The mortality rate is projected to remain relatively stable at 3.2 percent in 2011 and 2012.
- Adults age 65 and older had the highest mortality rate, at 5.6 percent in 2001 and decreasing to 3.9 percent in 2010. Adults ages 45 to 64 had the next highest mortality rate, at 2.6 percent in 2001 and decreasing to 1.6 percent in 2010. Adults ages 18 to 44 had the lowest mortality rate, at 2.1 percent in 2001 and decreasing to 1.4 percent in 2010.
- The mortality rate was similar for males and females, decreasing from 4.9 percent in 2001 to 3.3 percent in 2010.

In-Hospital Mortality Rate for All Adults

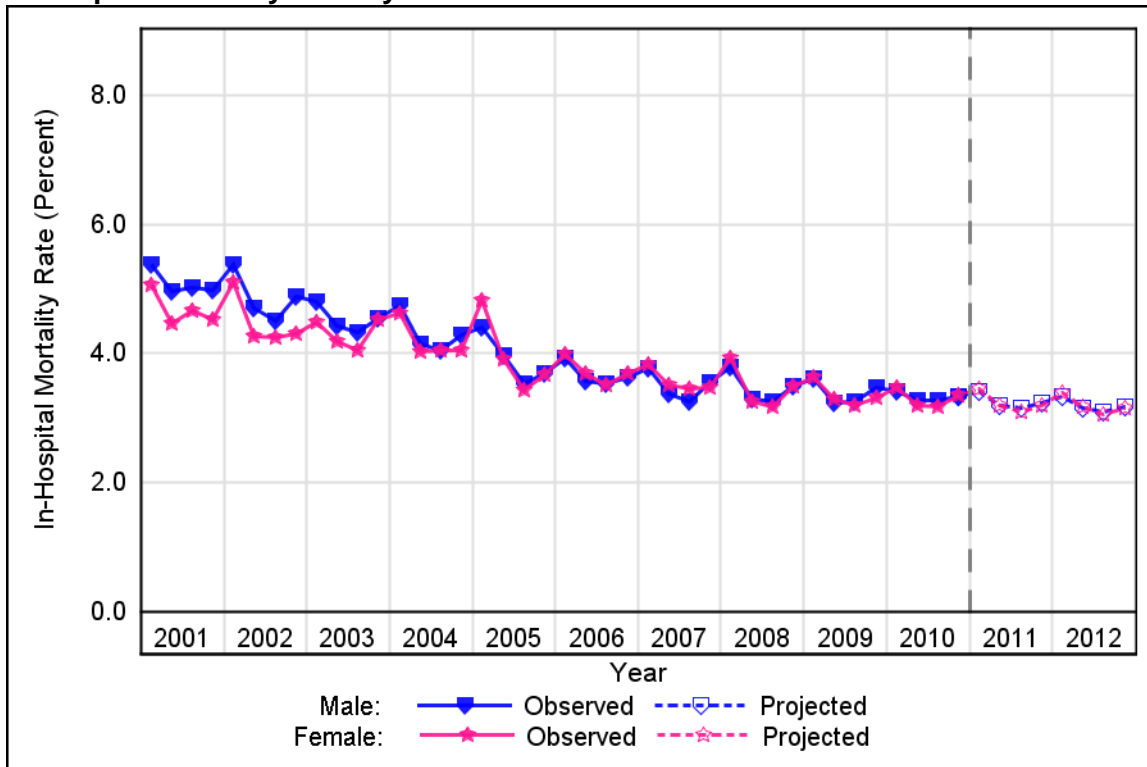


Source: Agency for Healthcare Research and Quality, Center for Delivery, Organization, and Markets, Healthcare Cost and Utilization Project, State Inpatient Databases.

In-Hospital Mortality Rate by Age



In-Hospital Mortality Rate by Gender



Source: Agency for Healthcare Research and Quality, Center for Delivery, Organization, and Markets, Healthcare Cost and Utilization Project, State Inpatient Databases.

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Stroke and Acute Cerebrovascular Disease

Acute cerebrovascular disease refers to conditions that cause either temporary or permanent central nerve system injury. A stroke occurs when a blood vessel that carries oxygen and nutrients to the brain is either blocked by a clot or bursts. When that happens, part of the brain cannot get the blood (and oxygen) it needs, which results in either temporary or permanent injury to the brain. Using the HCUP SID from 2001 to 2010 and early 2011 data from 10 States, different outcomes for inpatient discharges with a principal diagnosis of stroke and cerebrovascular disease are projected for 2011 to 2012.

Projections include the following:

- Total inpatient discharges for all adults, adults by age group, and adults by gender. Discharge counts exclude inpatient stays that were transferred out to another acute care hospital. This ensures that these events are not double counted.
- Average total hospital cost for all adults, adults by age group, and adults by gender. Average total hospital cost reflects actual expenses incurred in the production of hospital services; physician costs are not included. For comparison, a line is included that depicts the change in the average inpatient hospital cost per admission in the first quarter of 2001 (Q1 2001) due solely to economy-wide inflation. The difference between the actual/projected cost line and the inflation-adjusted Q1 2001 cost line represents cost increases due to other non-inflation factors, such as new technology, patient case mix, etc.
- Average length of stay for all adults, adults by age group, and adults by gender. In HCUP, the length of stay counts nights spent in the hospital. If a patient is admitted and discharged on the same day, the length of stay is zero.
- In-hospital mortality rate for all adults, adults by age group, and adults by gender.

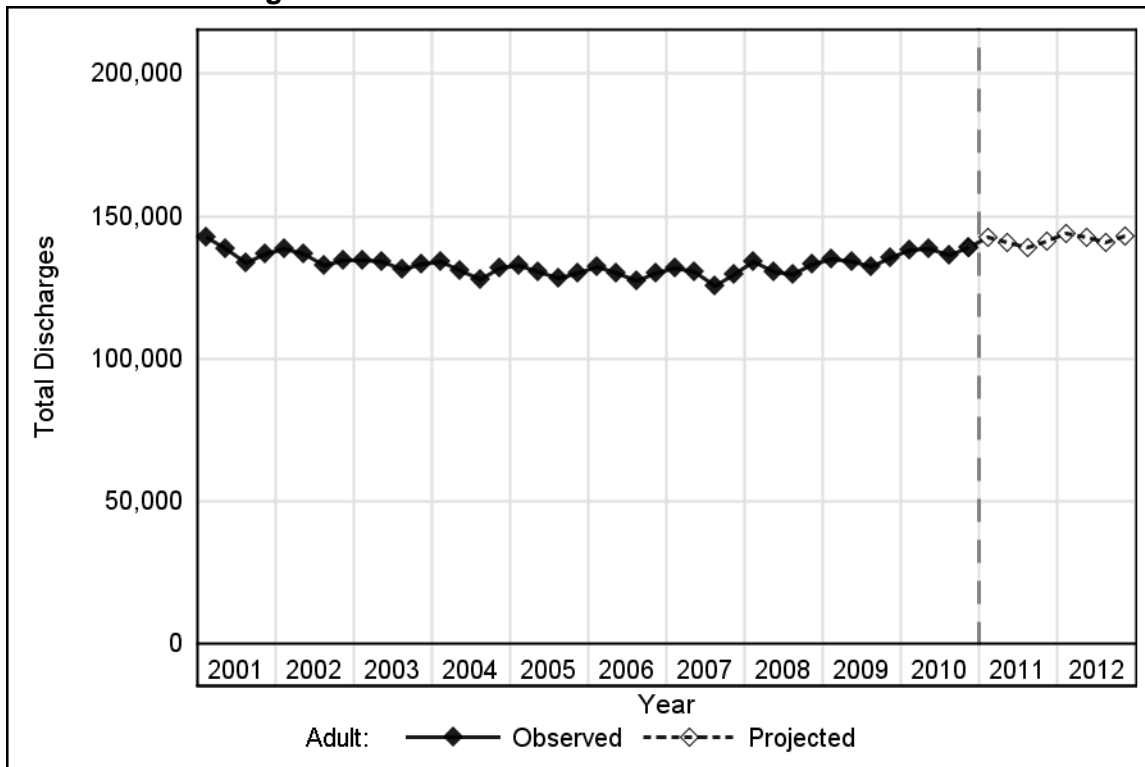
Stroke and Acute Cerebrovascular Disease

Number of Discharges

Key Findings:

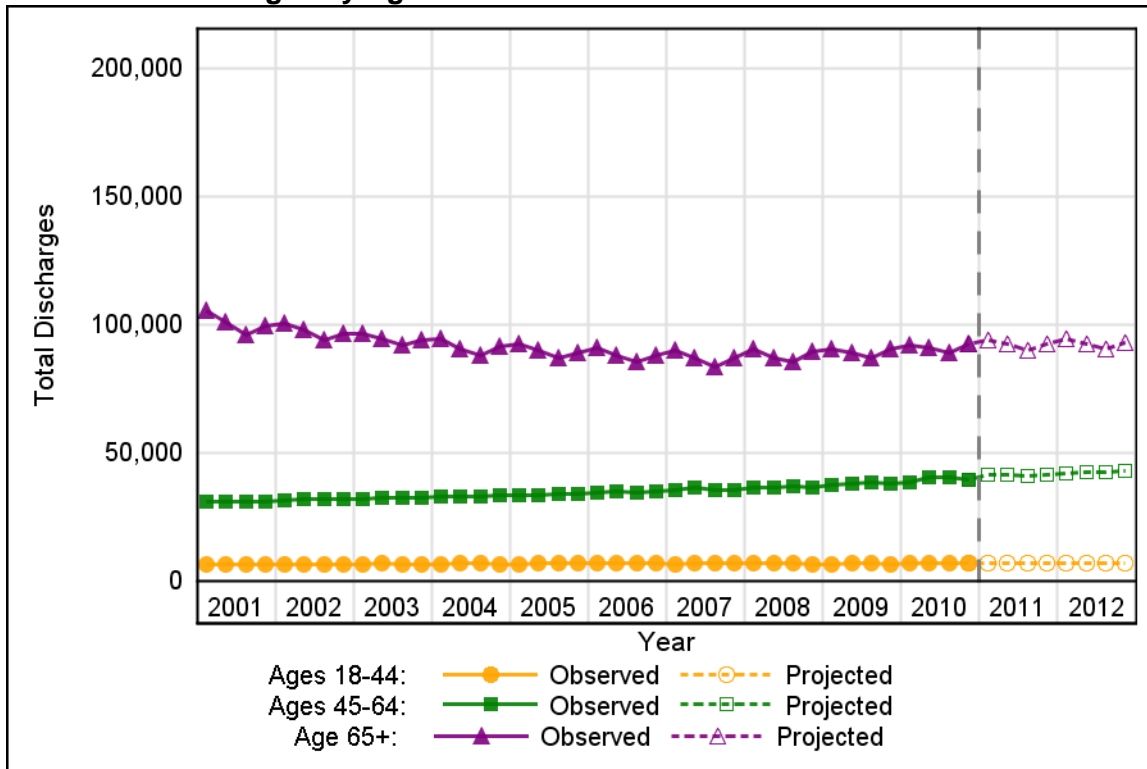
- The number of stroke and acute cerebrovascular disease discharges was relatively stable between 2001 and 2010, at about 133,000 discharges per quarter. Discharges are projected to be about 142,000 discharges per quarter in 2011 and 2012.
- Adults age 65 and older had the highest discharges, remaining relatively stable at about 92,000 discharges per quarter. Adults ages 45 to 64 had the next highest discharges, at about 31,000 discharges per quarter in 2001 and increasing to 40,000 discharges per quarter in 2010. Adults ages 18 to 44 had the lowest discharges, remaining relatively stable at about 7,000 discharges per quarter.
- Females had about 10,000 more discharges per quarter than did males, and discharges remained relatively stable for both genders over time. Females had about 71,500 discharges per quarter. Males had about 61,500 discharges per quarter.

Number of Discharges for All Adults

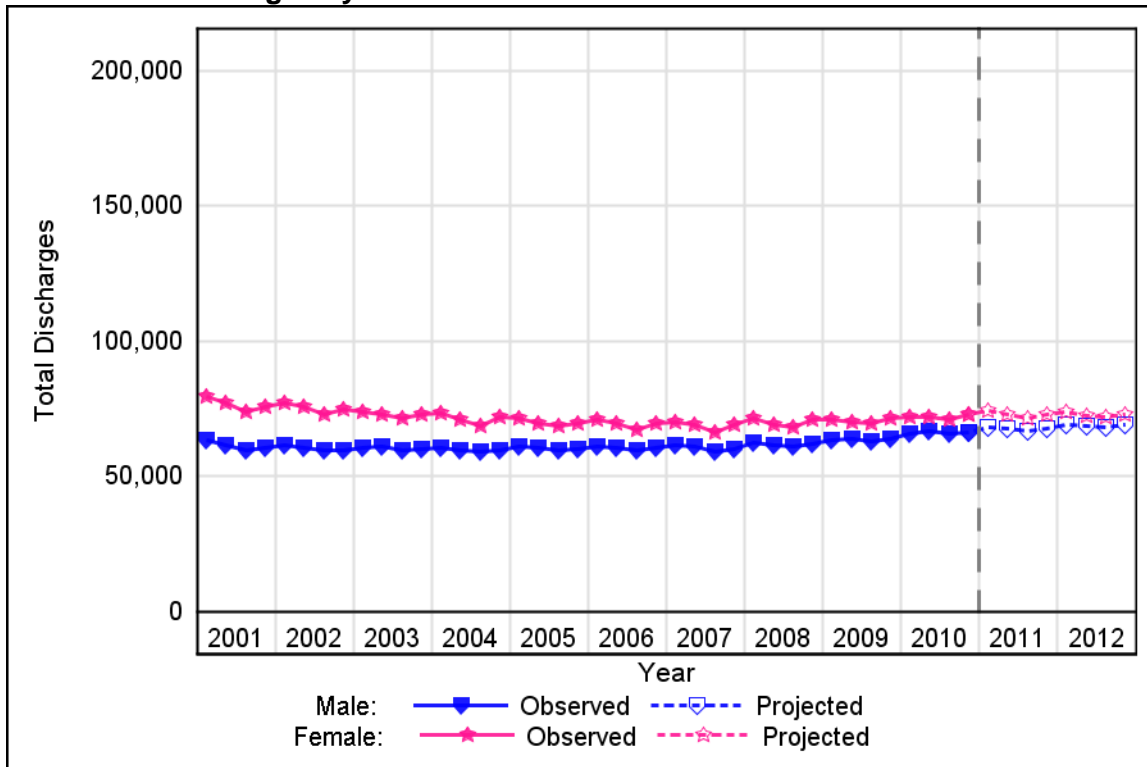


Source: Agency for Healthcare Research and Quality, Center for Delivery, Organization, and Markets, Healthcare Cost and Utilization Project, State Inpatient Databases.

Number of Discharges by Age



Number of Discharges by Gender



Source: Agency for Healthcare Research and Quality, Center for Delivery, Organization, and Markets, Healthcare Cost and Utilization Project, State Inpatient Databases.

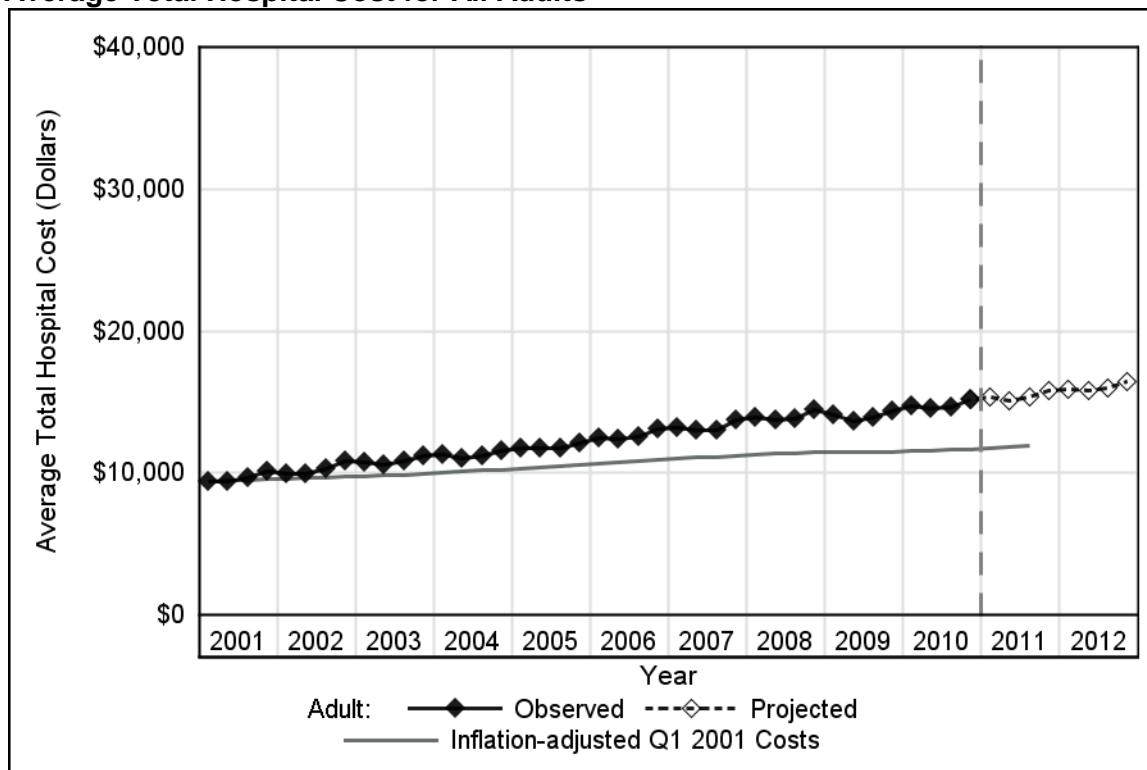
Stroke and Acute Cerebrovascular Disease

Average Total Hospital Cost

Key Findings:

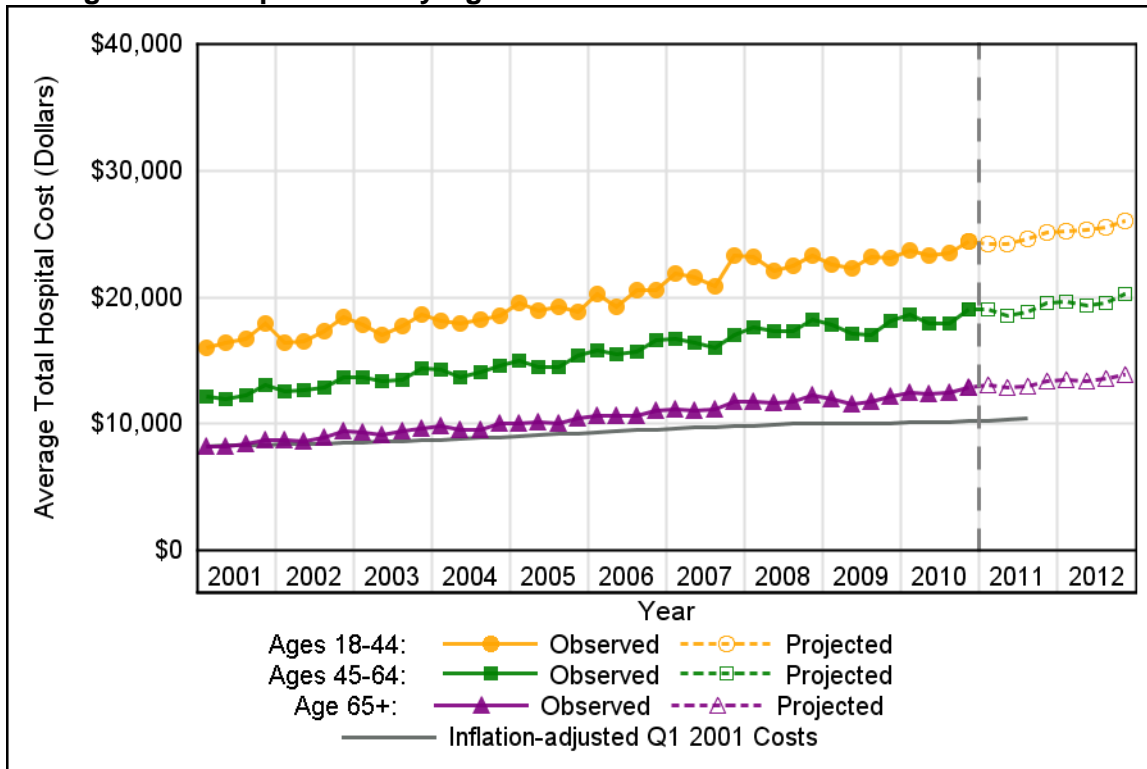
- The average hospital cost for discharges with stroke and acute cerebrovascular disease increased over time, from about \$9,500 in 2001 to \$15,000 in 2010. This increasing trend is projected to continue in 2011 and 2012, with the average hospital cost projected to be about \$16,500 at the end of 2012.
- The average hospital cost was highest for adults ages 18 to 44, increasing from about \$16,500 in 2001 to \$24,000 in 2010. Adults ages 45 to 64 had the next highest average hospital cost, at about \$12,500 in 2001 and increasing to \$18,500 in 2010. Adults age 65 and older had the lowest average hospital cost, at about \$8,500 in 2001 and increasing to \$12,500 in 2010.
- The average hospital cost was similar for males and females, increasing from about \$9,500 in 2001 to \$15,000 in 2010.
- Using the Gross Domestic Product (GDP) price index, a cost of \$9,500 in 2001 would be equivalent to a cost of \$12,000 in 2010. By 2010, the average hospital cost exceeded the cost expected by inflation alone.

Average Total Hospital Cost for All Adults

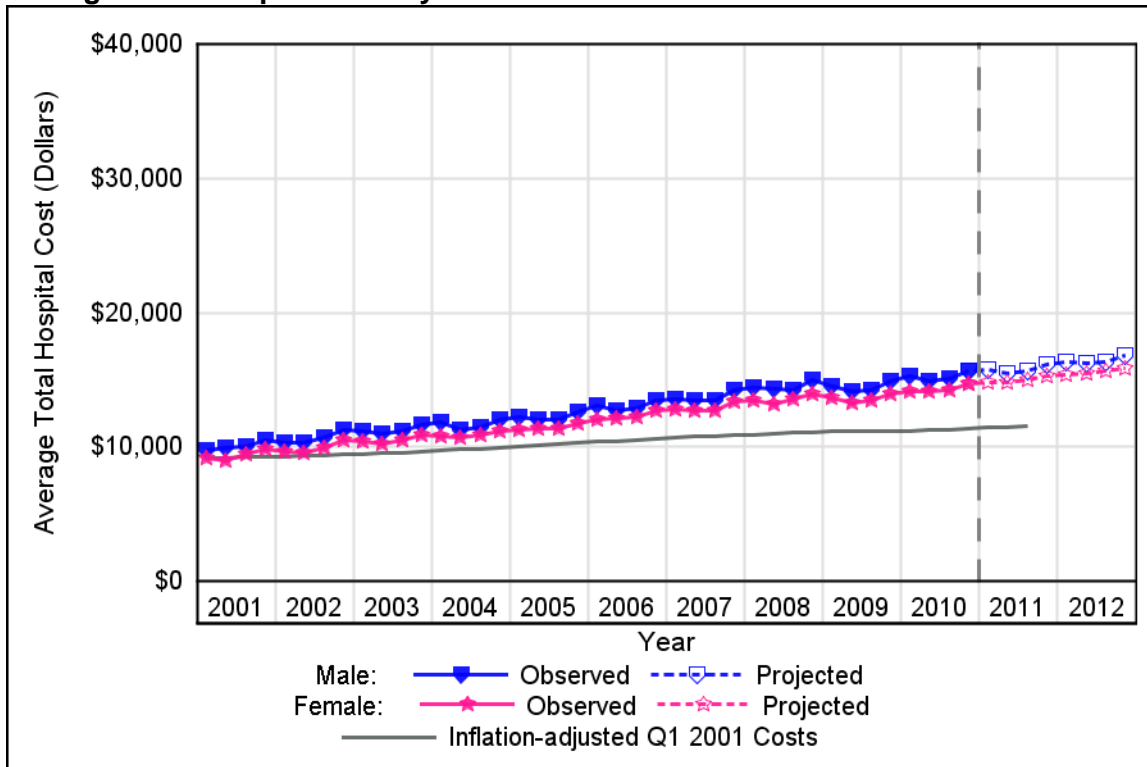


Inflation-adjusted Q1 2001 Costs: Cost per admission in the first quarter of 2001, adjusted for economy-wide inflation.
Source: Agency for Healthcare Research and Quality, Center for Delivery, Organization, and Markets, Healthcare Cost and Utilization Project, State Inpatient Databases.

Average Total Hospital Cost by Age



Average Total Hospital Cost by Gender



Inflation-adjusted Q1 2001 Costs: Cost per admission in the first quarter of 2001, adjusted for economy-wide inflation. Source: Agency for Healthcare Research and Quality, Center for Delivery, Organization, and Markets, Healthcare Cost and Utilization Project, State Inpatient Databases.

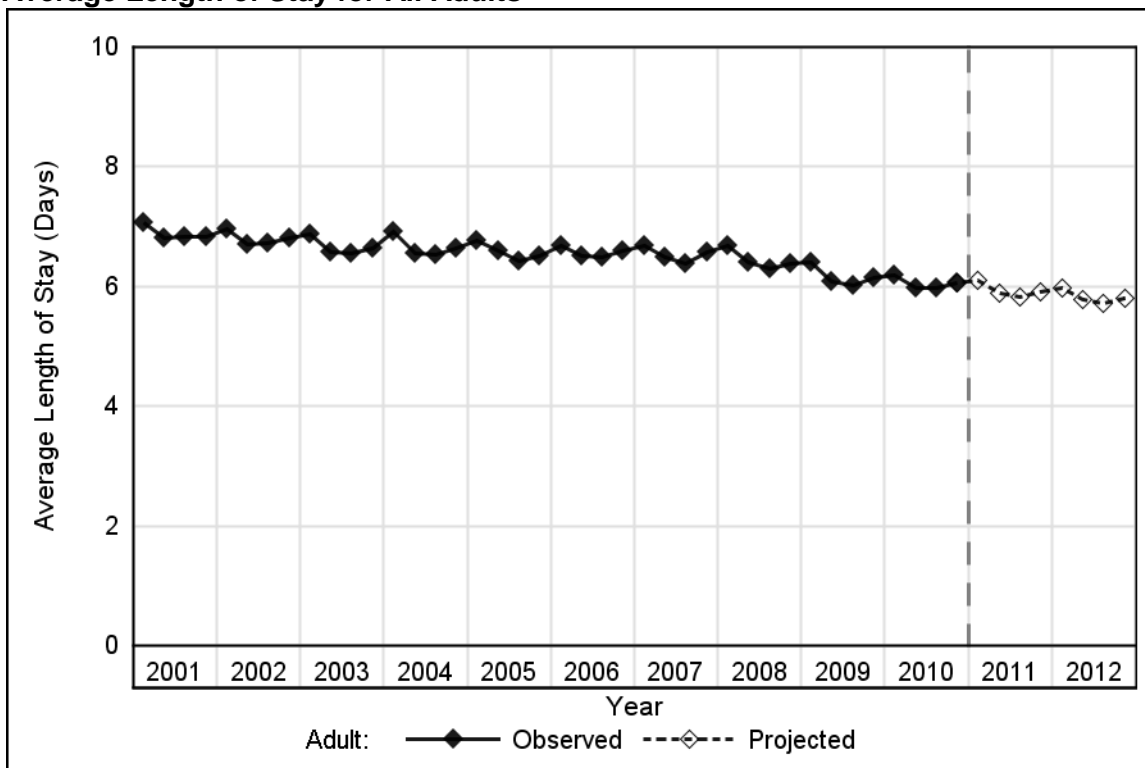
Stroke and Acute Cerebrovascular Disease

Average Length of Stay

Key Findings:

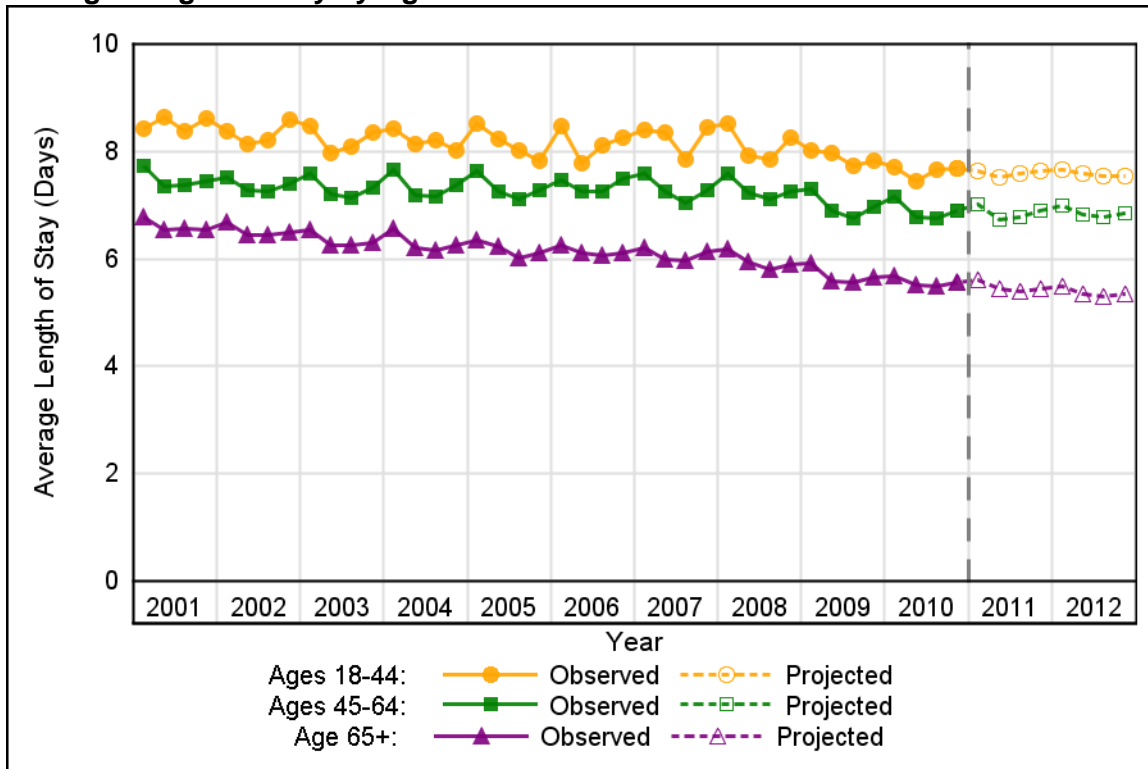
- The length of stay for discharges with stroke and acute cerebrovascular disease decreased over time, from 6.9 days in 2001 to 6.1 days in 2010. Length of stay is projected to continue to decrease to 5.8 days in 2012.
- Adults ages 18 to 44 had the longest length of stay, at 8.5 days in 2001 and decreasing to 7.6 days in 2010. Adults ages 45 to 64 had the next longest length of stay, remaining relatively stable at 7.3 days between 2001 and 2010. Adults age 65 and older had the shortest length of stay, at 6.6 days in 2001 and decreasing to 5.6 days in 2010.
- Length of stay was similar for males and females, decreasing from 6.9 days in 2001 to 6.1 days in 2010.

Average Length of Stay for All Adults

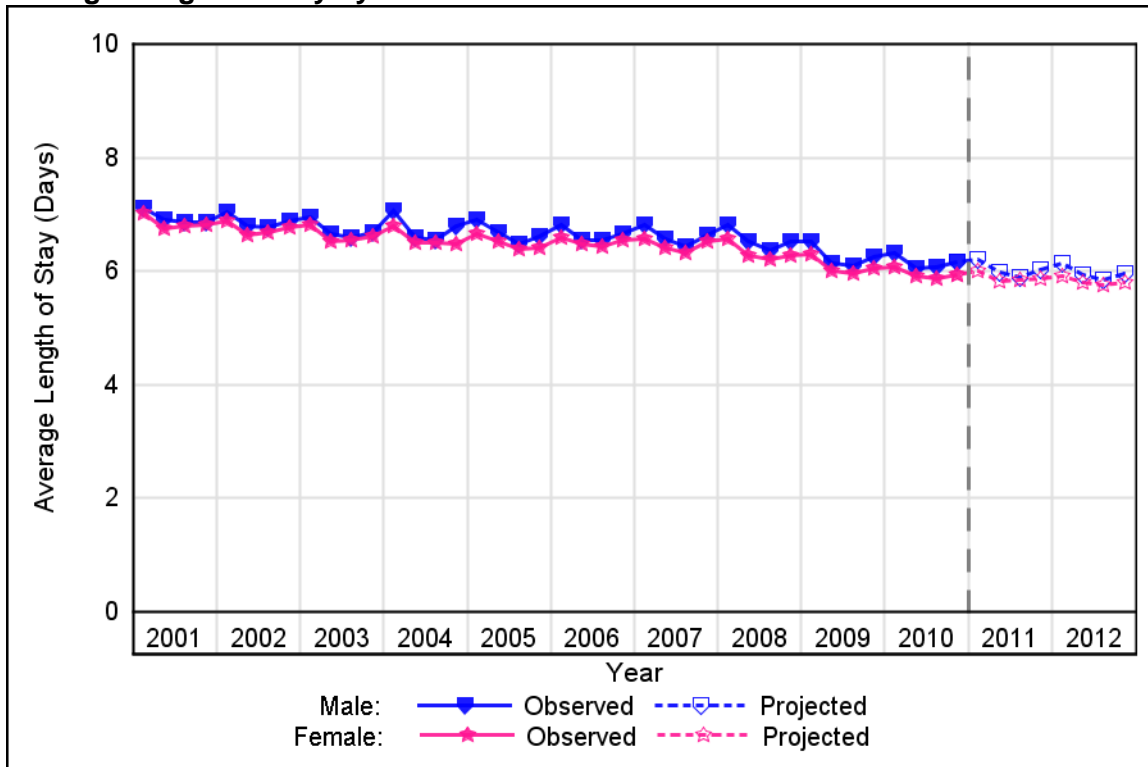


Source: Agency for Healthcare Research and Quality, Center for Delivery, Organization, and Markets, Healthcare Cost and Utilization Project, State Inpatient Databases.

Average Length of Stay by Age



Average Length of Stay by Gender



Source: Agency for Healthcare Research and Quality, Center for Delivery, Organization, and Markets, Healthcare Cost and Utilization Project, State Inpatient Databases.

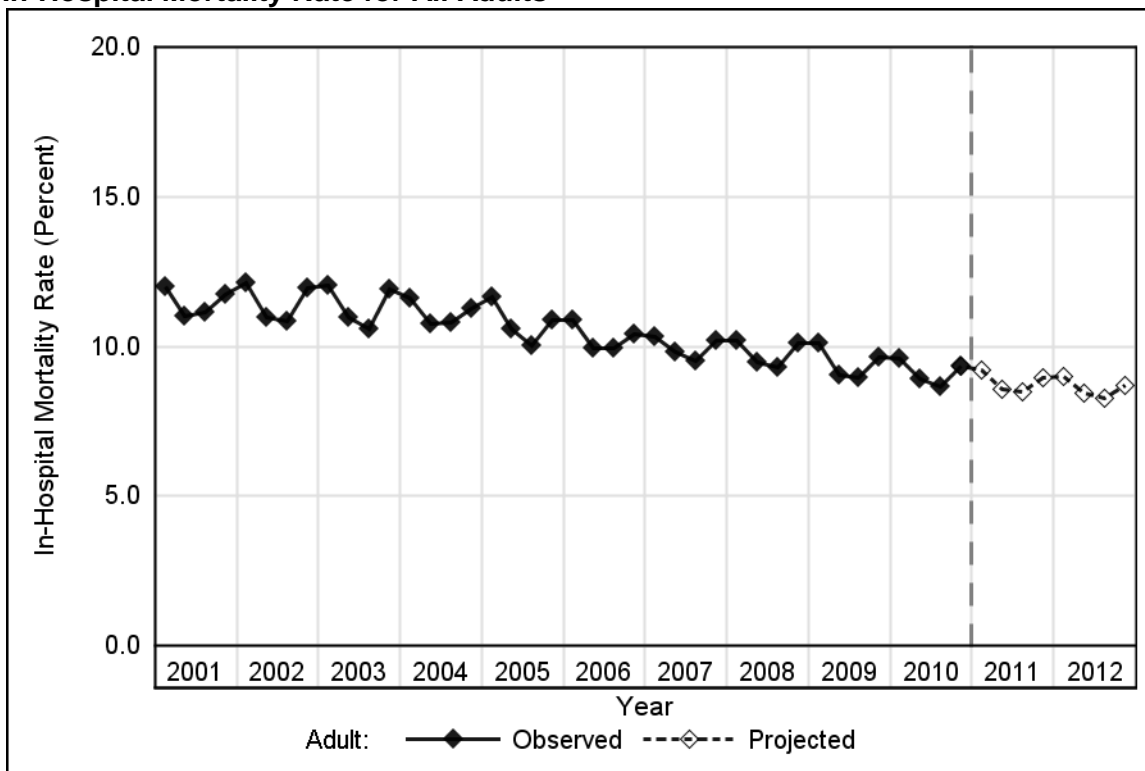
Stroke and Acute Cerebrovascular Disease

In-Hospital Mortality Rate

Key Findings:

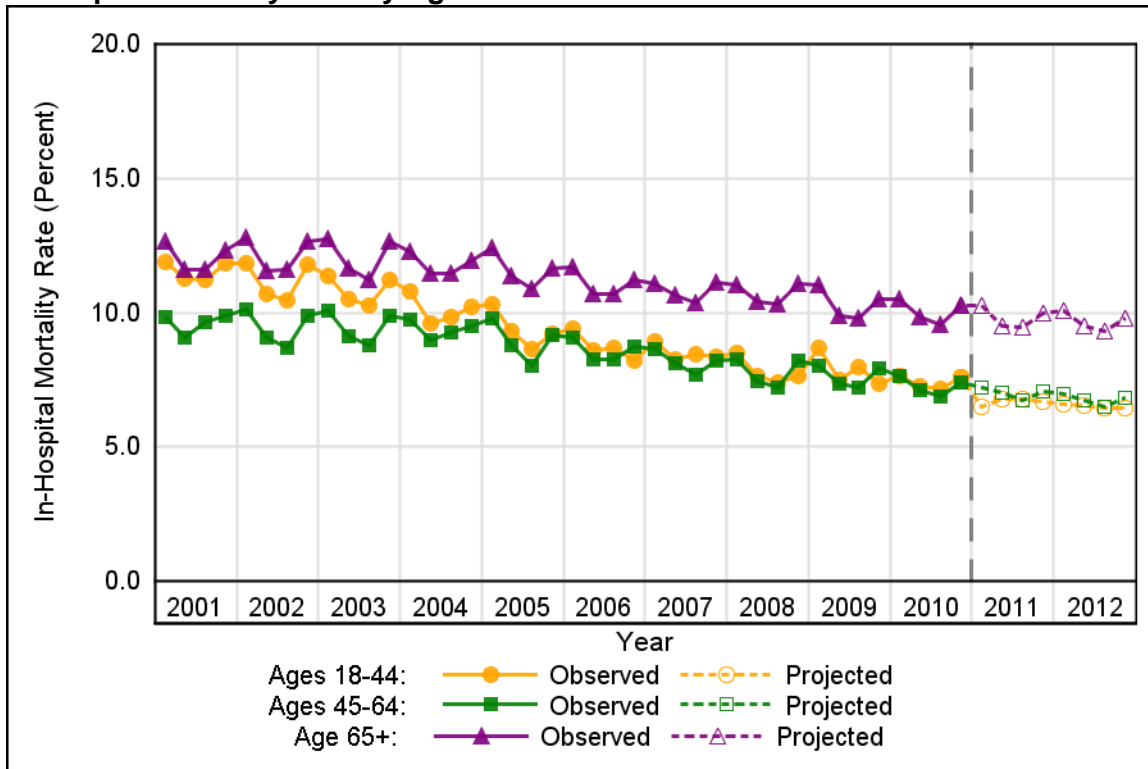
- The mortality rate for discharges with stroke and acute cerebrovascular disease decreased over time, from 11.5 percent in 2001 to 9.2 percent in 2010. The mortality rate is projected to continue to decrease to 8.6 percent in 2012.
- Adults age 65 and older had the highest mortality rate, at 12.0 percent in 2001 and decreasing to 10.0 percent in 2010. The mortality rate was 2.0 percentage points higher for adults ages 18 to 44 in 2001 (11.6 percent) than for adults ages 45 to 64 (9.6 percent). However, this initial difference disappeared over time, with both of the younger age groups having a mortality rate around 7.3 percent in 2010.
- The mortality rate was similar for males and females, decreasing from 11.5 percent in 2001 to 9.1 percent in 2010.

In-Hospital Mortality Rate for All Adults

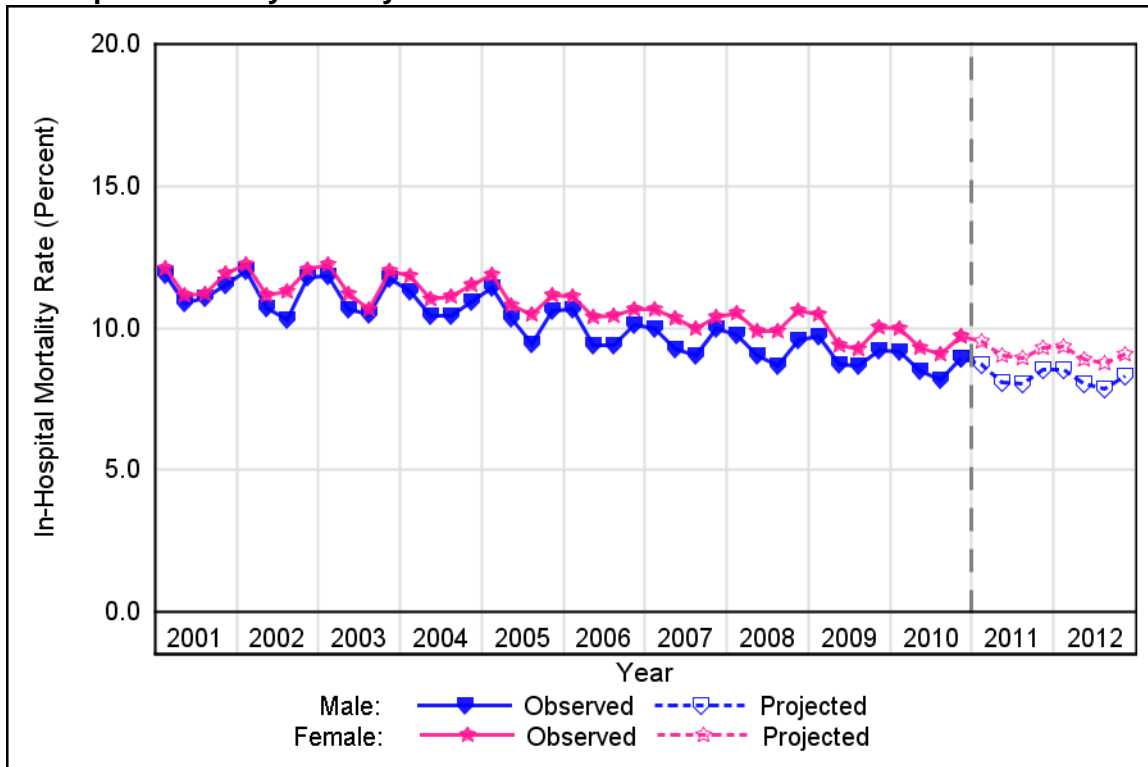


Source: Agency for Healthcare Research and Quality, Center for Delivery, Organization, and Markets, Healthcare Cost and Utilization Project, State Inpatient Databases.

In-Hospital Mortality Rate by Age



In-Hospital Mortality Rate by Gender



Source: Agency for Healthcare Research and Quality, Center for Delivery, Organization, and Markets, Healthcare Cost and Utilization Project, State Inpatient Databases.

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Atrial Fibrillation

In atrial fibrillation, instead of the heart contracting and relaxing to a regular rhythm, the upper chambers of the heart beat irregularly and cause blood to move ineffectively into the ventricles. Using the HCUP SID from 2001 to 2010 and early 2011 data from 10 States, different outcomes for inpatient discharges with a principal diagnosis of atrial fibrillation are projected for 2011 to 2012.

Projections include the following:

- Total inpatient discharges for all adults, adults by age group, and adults by gender. Discharge counts exclude inpatient stays that were transferred out to another acute care hospital. This ensures that these events are not double counted.
- Average total hospital cost for all adults, adults by age group, and adults by gender. Average total hospital cost reflects actual expenses incurred in the production of hospital services; physician costs are not included. For comparison, a line is included that depicts the change in the average inpatient hospital cost per admission in the first quarter of 2001 (Q1 2001) due solely to economy-wide inflation. The difference between the actual/projected cost line and the inflation-adjusted Q1 2001 cost line represents cost increases due to other non-inflation factors, such as new technology, patient case mix, etc.
- Average length of stay for all adults, adults by age group, and adults by gender. In HCUP, the length of stay counts nights spent in the hospital. If a patient is admitted and discharged on the same day, the length of stay is zero.
- In-hospital mortality rate for all adults, adults by age group, and adults by gender.

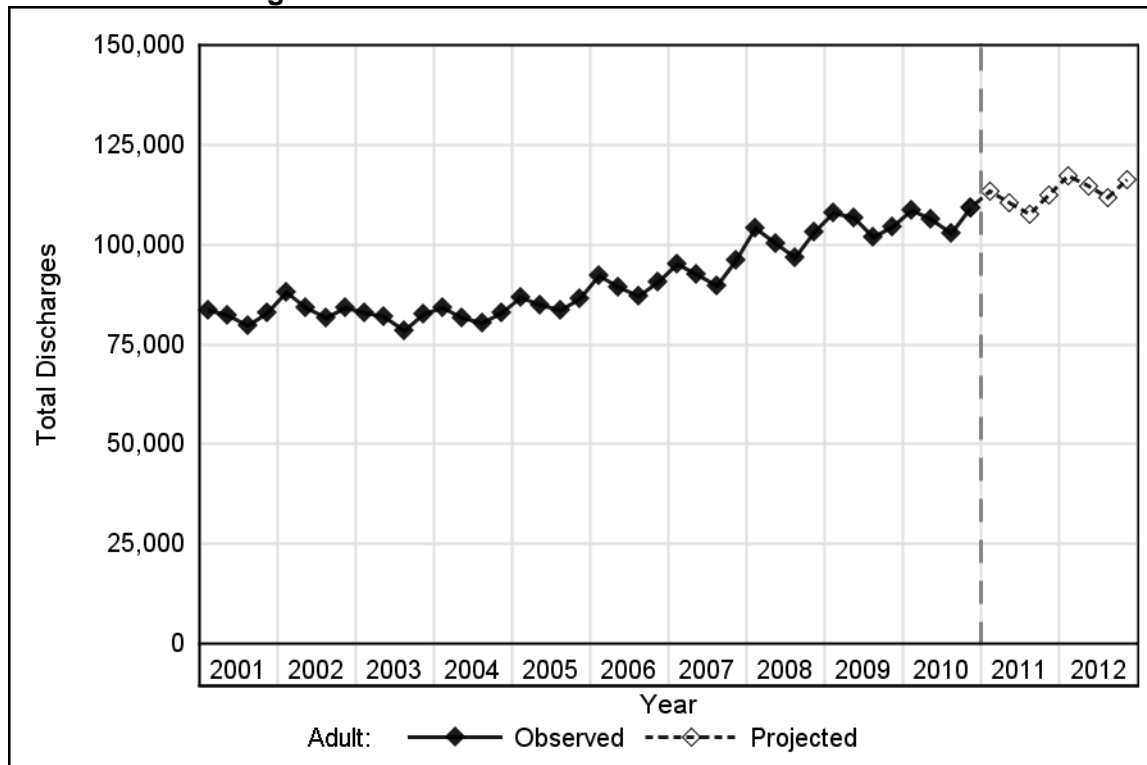
Atrial Fibrillation

Number of Discharges

Key Findings:

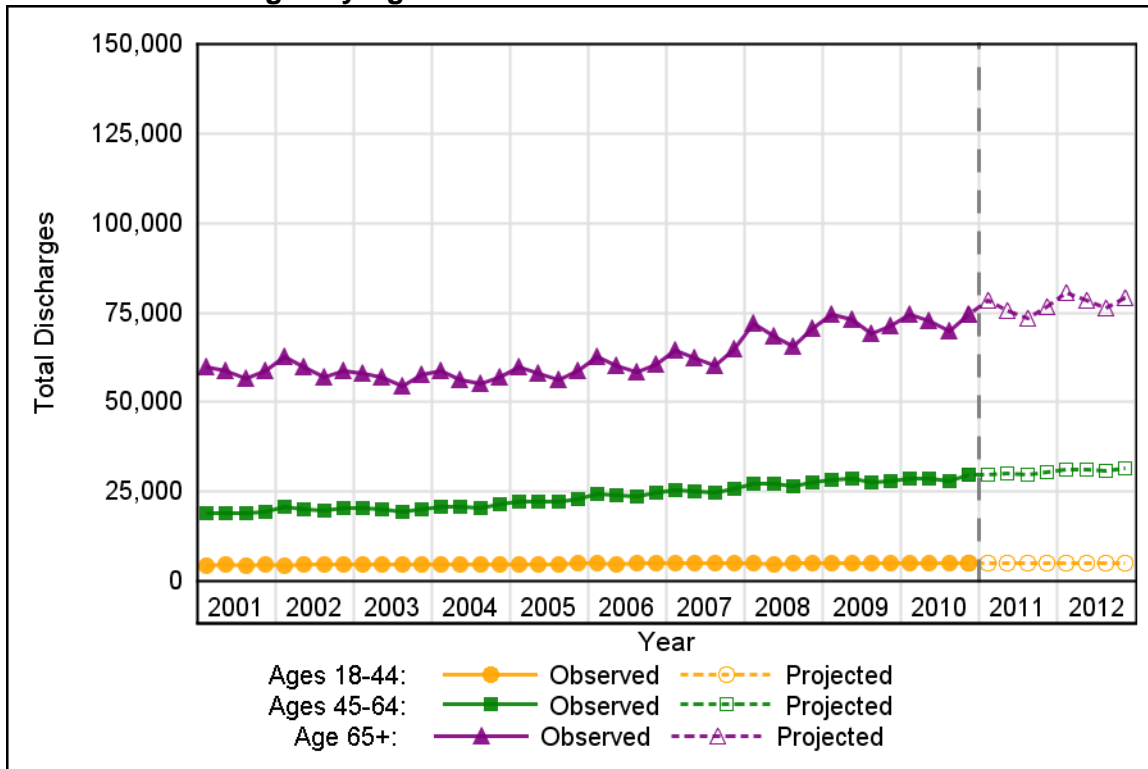
- The number of atrial fibrillation discharges increased over time, from about 82,000 discharges per quarter in 2001 to 106,500 discharges per quarter in 2010. This increasing trend is projected to continue in 2011 and 2012, with quarterly discharges projected to be about 116,500 at the end of 2012.
- Adults age 65 and older had the highest discharges, at about 58,500 discharges per quarter in 2001 and increasing to 73,000 discharges per quarter in 2010. Adults ages 45 to 64 had the next highest discharges, at about 19,000 discharges per quarter in 2001 and increasing to 29,000 discharges per quarter in 2010. Adults ages 18 to 44 had the lowest discharges, remaining relatively stable at about 5,000 discharges per quarter between 2001 and 2010.
- Females had about 5,000 more discharges per quarter than did males. Females had about 44,000 discharges per quarter in 2001, increasing to 56,000 discharges per quarter in 2010. Males had about 38,000 discharges per quarter in 2001, increasing to 51,000 discharges per quarter in 2010.

Number of Discharges for All Adults

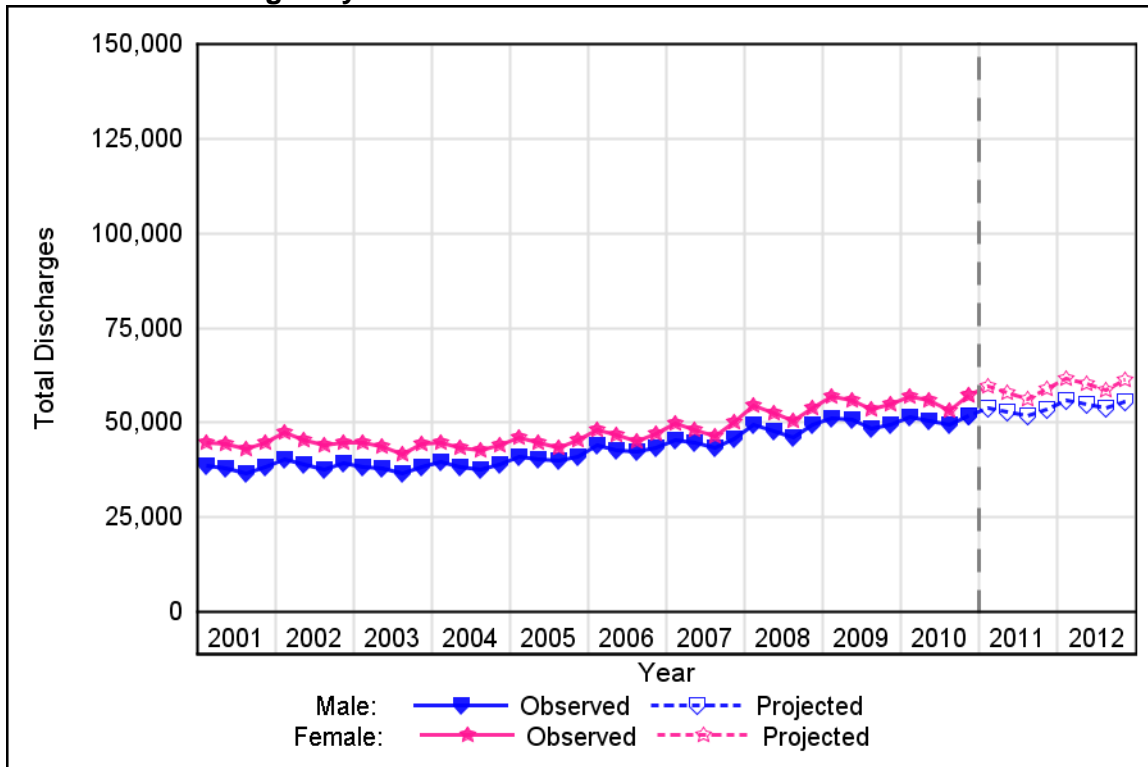


Source: Agency for Healthcare Research and Quality, Center for Delivery, Organization, and Markets, Healthcare Cost and Utilization Project, State Inpatient Databases.

Number of Discharges by Age



Number of Discharges by Gender



Source: Agency for Healthcare Research and Quality, Center for Delivery, Organization, and Markets, Healthcare Cost and Utilization Project, State Inpatient Databases.

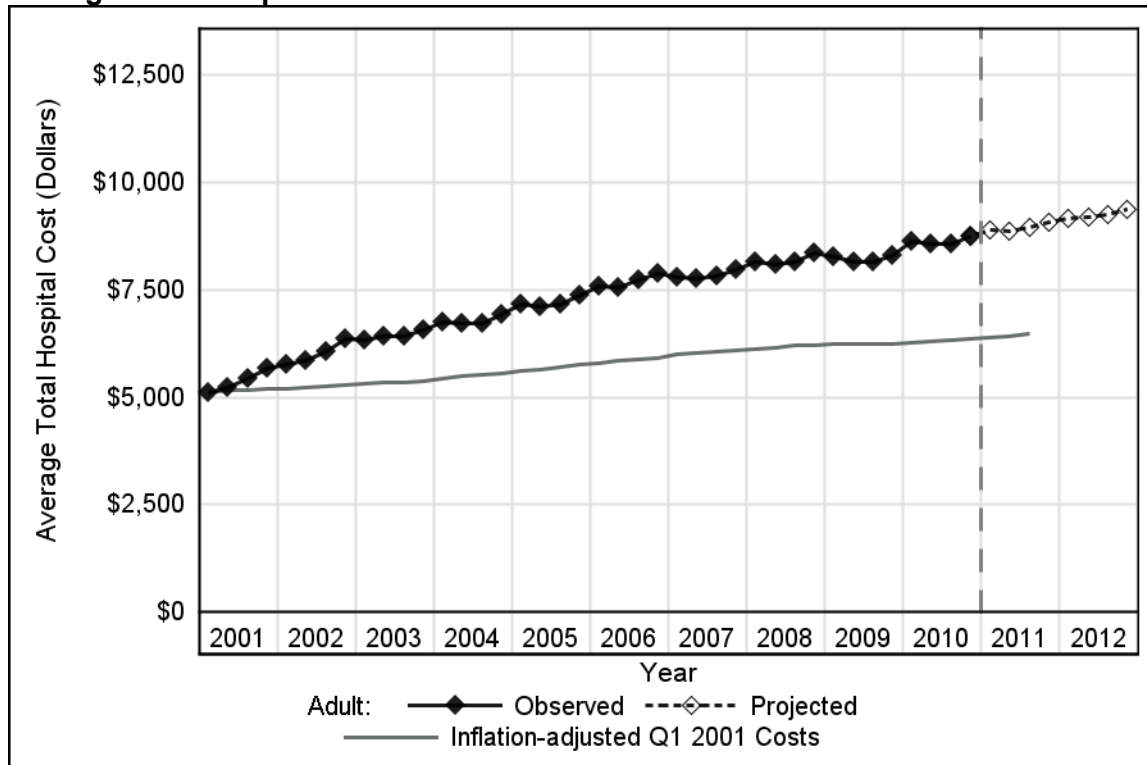
Atrial Fibrillation

Average Total Hospital Cost

Key Findings:

- The average hospital cost for discharges with atrial fibrillation increased over time, from about \$5,500 in 2001 to \$8,500 in 2010. This increasing trend is projected to continue in 2011 and 2012, with the average hospital cost projected to be about \$9,500 at the end of 2012.
- The average hospital cost was similar for the two older age groups, increasing from about \$5,500 in 2001 to \$9,000 in 2010. The average hospital cost for adults ages 18 to 44 was lower than for the two older age groups but also exhibited an increasing trend, from about \$4,000 in 2001 to \$7,000 in 2010.
- The average hospital cost was similar for males and females, increasing from about \$5,500 in 2001 to \$8,500 in 2010.
- Using the Gross Domestic Product (GDP) price index, a cost of \$5,500 in 2001 would be equivalent to a cost of \$7,000 in 2010. By 2010, the average hospital cost exceeded the cost expected by inflation alone.

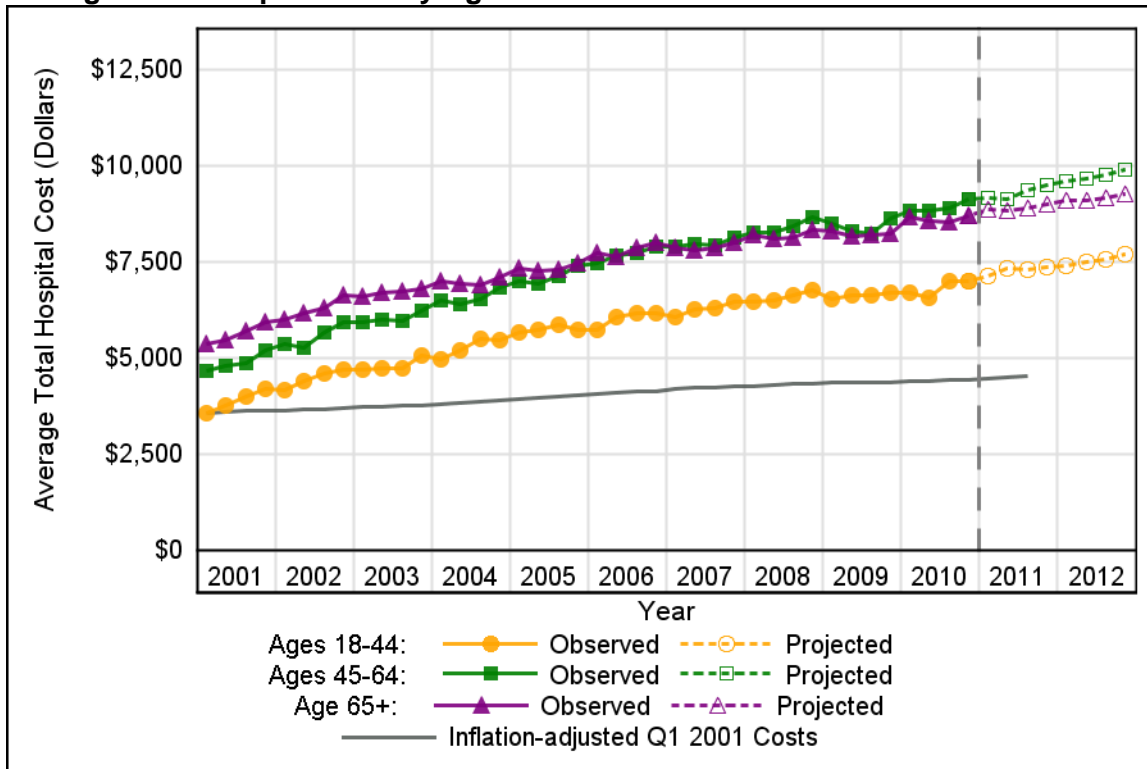
Average Total Hospital Cost for All Adults



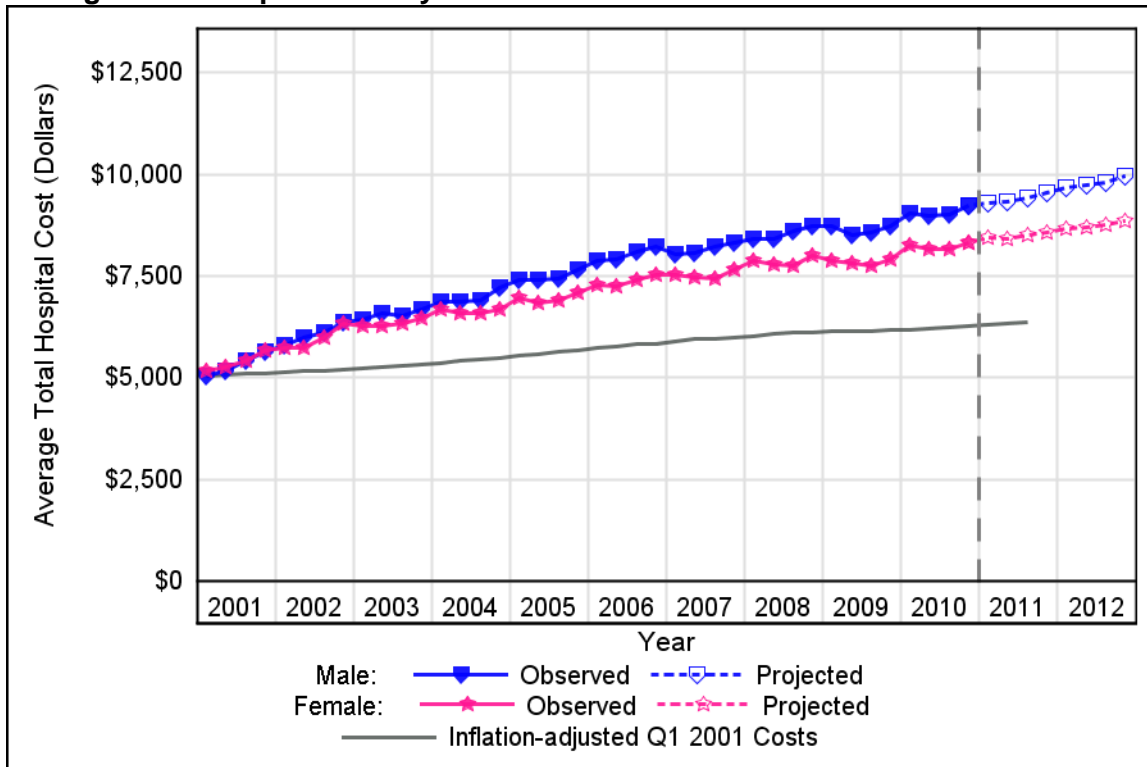
Inflation-adjusted Q1 2001 Costs: Cost per admission in the first quarter of 2001, adjusted for economy-wide inflation.

Source: Agency for Healthcare Research and Quality, Center for Delivery, Organization, and Markets, Healthcare Cost and Utilization Project, State Inpatient Databases.

Average Total Hospital Cost by Age



Average Total Hospital Cost by Gender



Inflation-adjusted Q1 2001 Costs: Cost per admission in the first quarter of 2001, adjusted for economy-wide inflation. Source: Agency for Healthcare Research and Quality, Center for Delivery, Organization, and Markets, Healthcare Cost and Utilization Project, State Inpatient Databases.

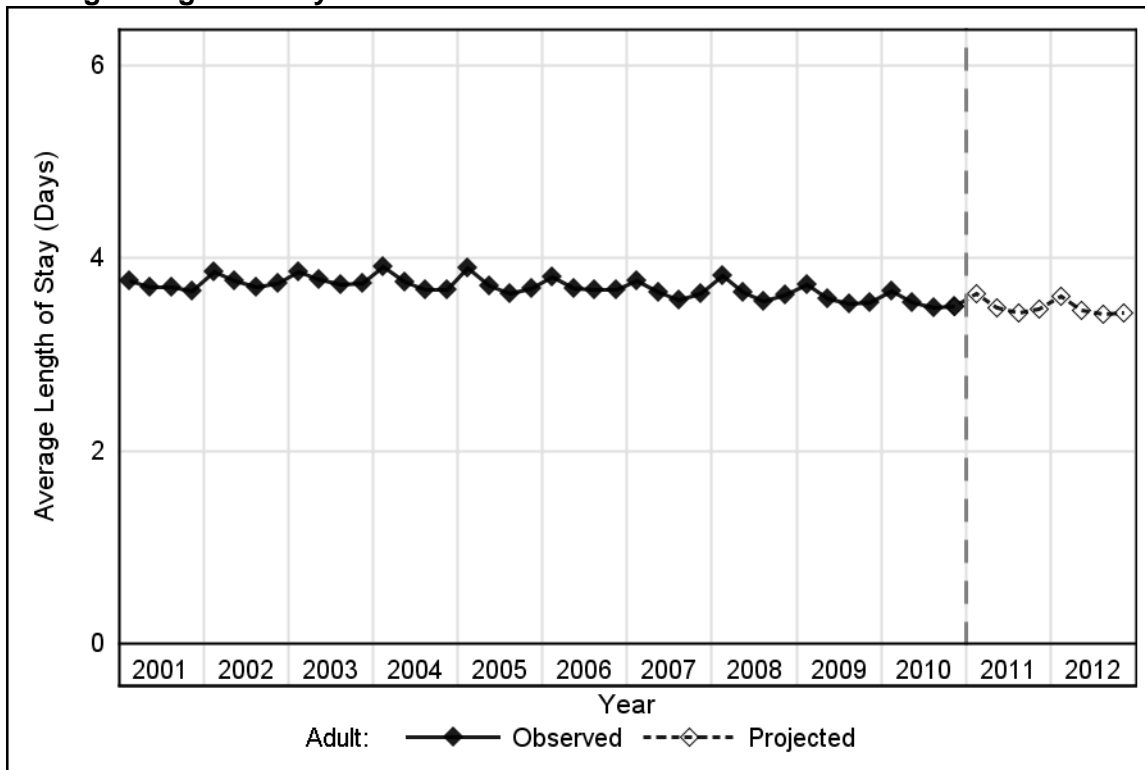
Atrial Fibrillation

Average Length of Stay

Key Findings:

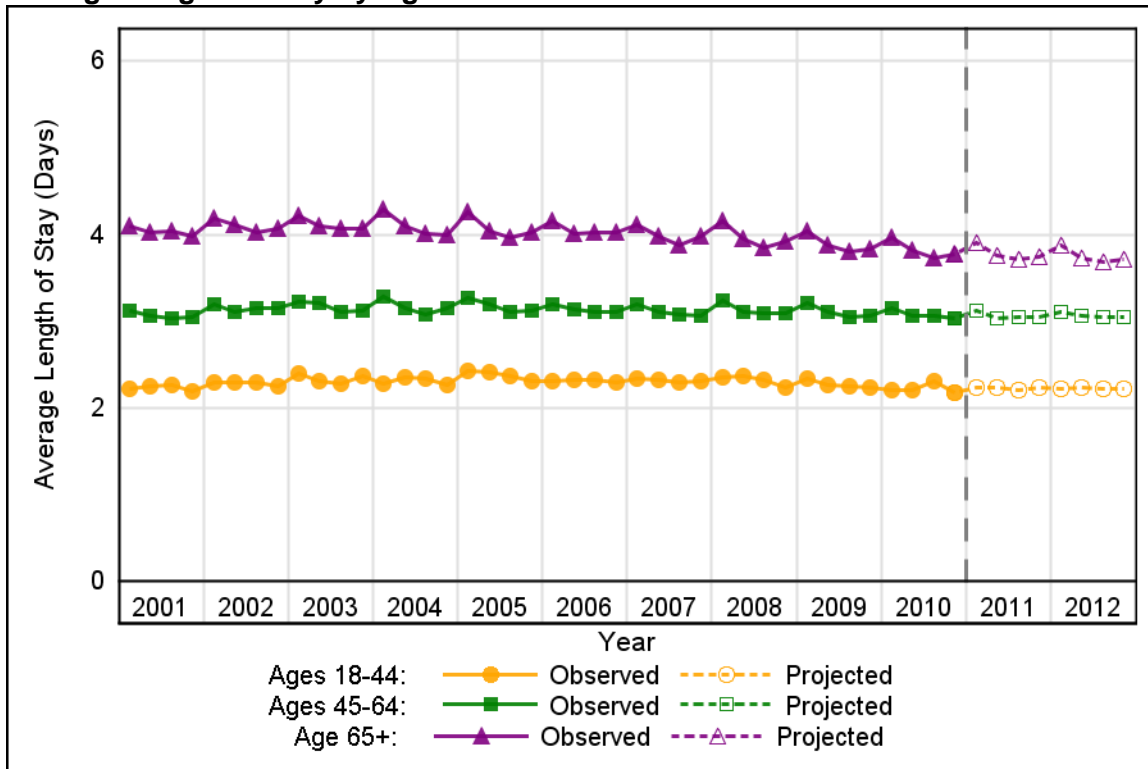
- The length of stay for discharges with atrial fibrillation vacillated around 3.7 days between 2001 and 2010. Length of stay is projected to vacillate around 3.5 days in 2011 and 2012.
- Length of stay was relatively stable over time for all three age groups. Adults age 65 and older had the longest length of stay at 4.0 days. Adults ages 45 to 64 had the next longest length of stay at 3.1 days. Adults ages 18 to 44 had the shortest length of stay at 2.3 days.
- Length of stay was 0.5 days longer for females than for males, and length of stay remained relatively stable over time for both genders. Females had a length of stay of 3.9 days. Males had a length of stay of 3.4 days.

Average Length of Stay for All Adults

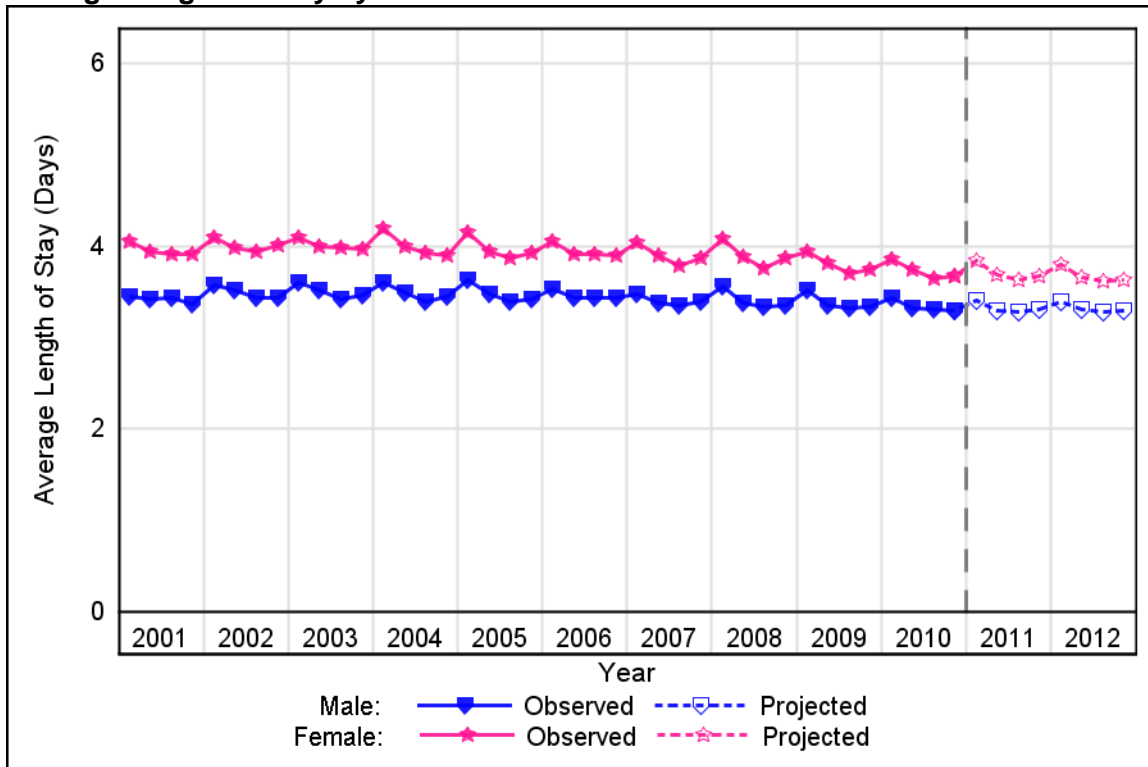


Source: Agency for Healthcare Research and Quality, Center for Delivery, Organization, and Markets, Healthcare Cost and Utilization Project, State Inpatient Databases.

Average Length of Stay by Age



Average Length of Stay by Gender



Source: Agency for Healthcare Research and Quality, Center for Delivery, Organization, and Markets, Healthcare Cost and Utilization Project, State Inpatient Databases.

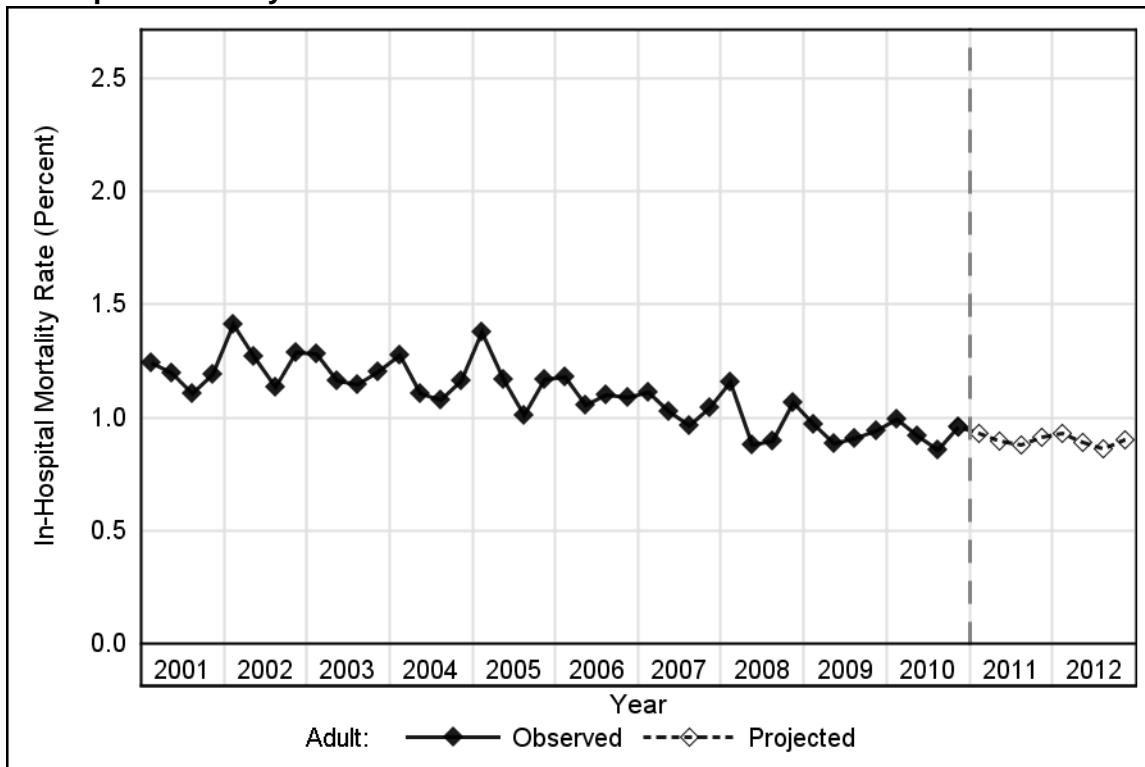
Atrial Fibrillation

In-Hospital Mortality Rate

Key Findings:

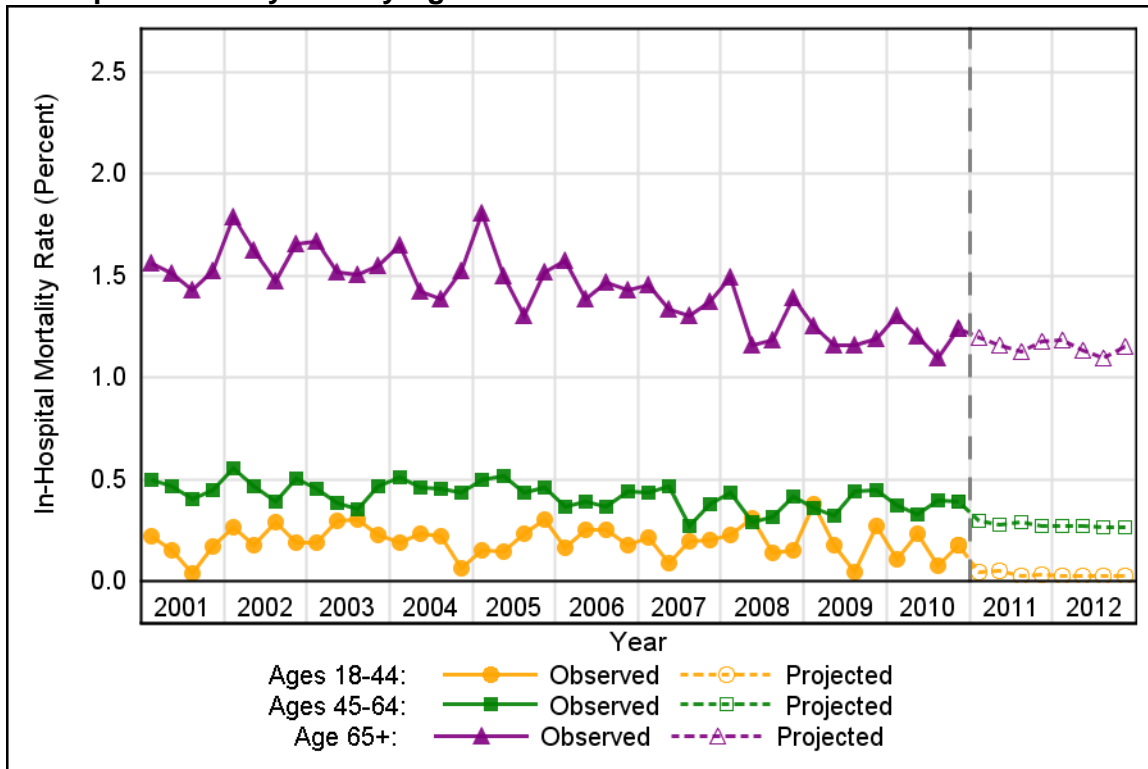
- The mortality rate for discharges with atrial fibrillation decreased over time, from 1.2 percent in 2001 to 0.9 percent in 2010. The mortality rate is projected to remain relatively stable at 0.9 percent in 2011 and 2012.
- Adults age 65 and older had the highest mortality rate, at 1.5 percent in 2001 and decreasing to 1.2 percent in 2010. Adults ages 45 to 64 had the next highest mortality rate, at 0.5 percent in 2001 and decreasing to 0.4 percent in 2010. The mortality rate for adults ages 18 to 44 vacillated around 0.2 percent between 2001 and 2010.
- The mortality rate was 0.2 percentage points higher for females than for males. Females had a mortality rate that decreased from 1.3 percent in 2001 to 1.0 percent in 2010. Males had a mortality rate that decreased from 1.1 percent in 2001 to 0.8 percent in 2010.

In-Hospital Mortality Rate for All Adults

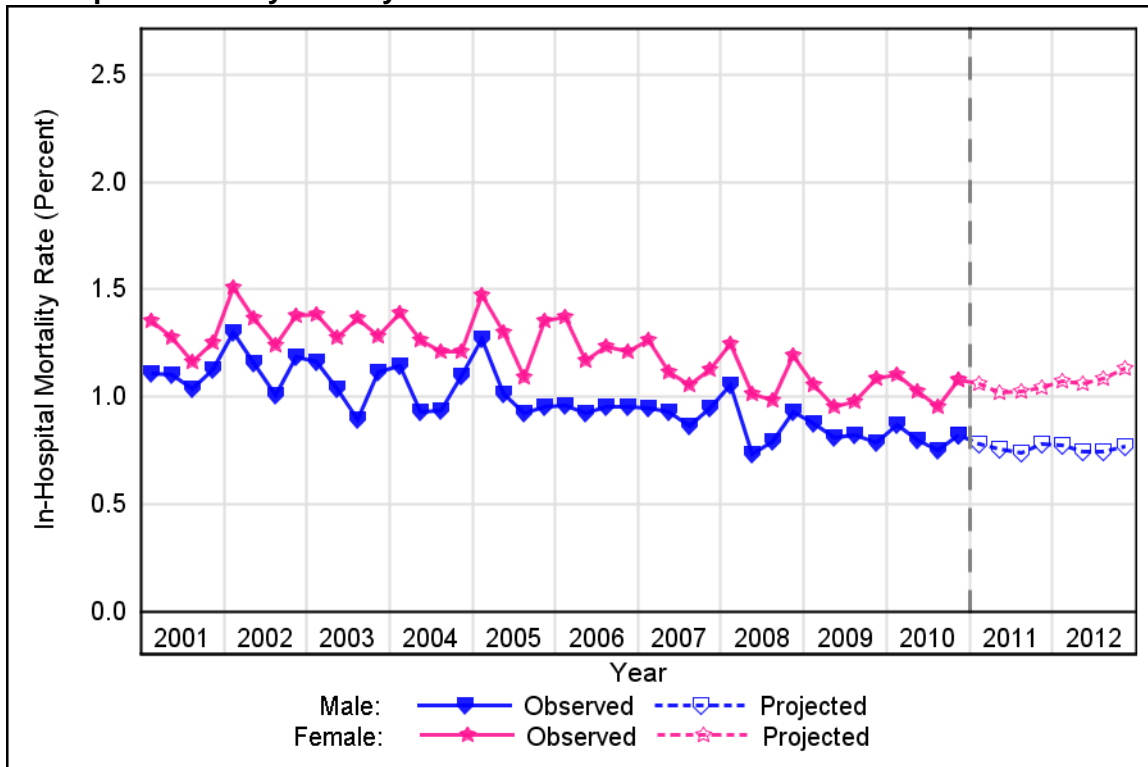


Source: Agency for Healthcare Research and Quality, Center for Delivery, Organization, and Markets, Healthcare Cost and Utilization Project, State Inpatient Databases.

In-Hospital Mortality Rate by Age



In-Hospital Mortality Rate by Gender



Source: Agency for Healthcare Research and Quality, Center for Delivery, Organization, and Markets, Healthcare Cost and Utilization Project, State Inpatient Databases.

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Cardiovascular/Cerebrovascular Procedures

Cardiovascular/cerebrovascular procedures consist of a range of surgeries including, but not limited to, coronary artery bypass graft, percutaneous transluminal coronary angioplasty, aortic resection, and carotid endarterectomy. Using the HCUP SID from 2001 to 2010 and early 2011 data from 10 States, different outcomes for inpatient discharges that had a cardiovascular/cerebrovascular procedure are projected for 2011 to 2012.

Projections include the following:

- Total inpatient discharges for all adults, adults by age group, and adults by gender. Discharge counts exclude inpatient stays that were transferred out to another acute care hospital. This ensures that these events are not double counted.
- Average total hospital cost for all adults, adults by age group, and adults by gender. Average total hospital cost reflects actual expenses incurred in the production of hospital services; physician costs are not included. For comparison, a line is included that depicts the change in the average inpatient hospital cost per admission in the first quarter of 2001 (Q1 2001) due solely to economy-wide inflation. The difference between the actual/projected cost line and the inflation-adjusted Q1 2001 cost line represents cost increases due to other non-inflation factors, such as new technology, patient case mix, etc.
- Average length of stay for all adults, adults by age group, and adults by gender. In HCUP, the length of stay counts nights spent in the hospital. If a patient is admitted and discharged on the same day, the length of stay is zero.
- In-hospital mortality rate for all adults, adults by age group, and adults by gender.

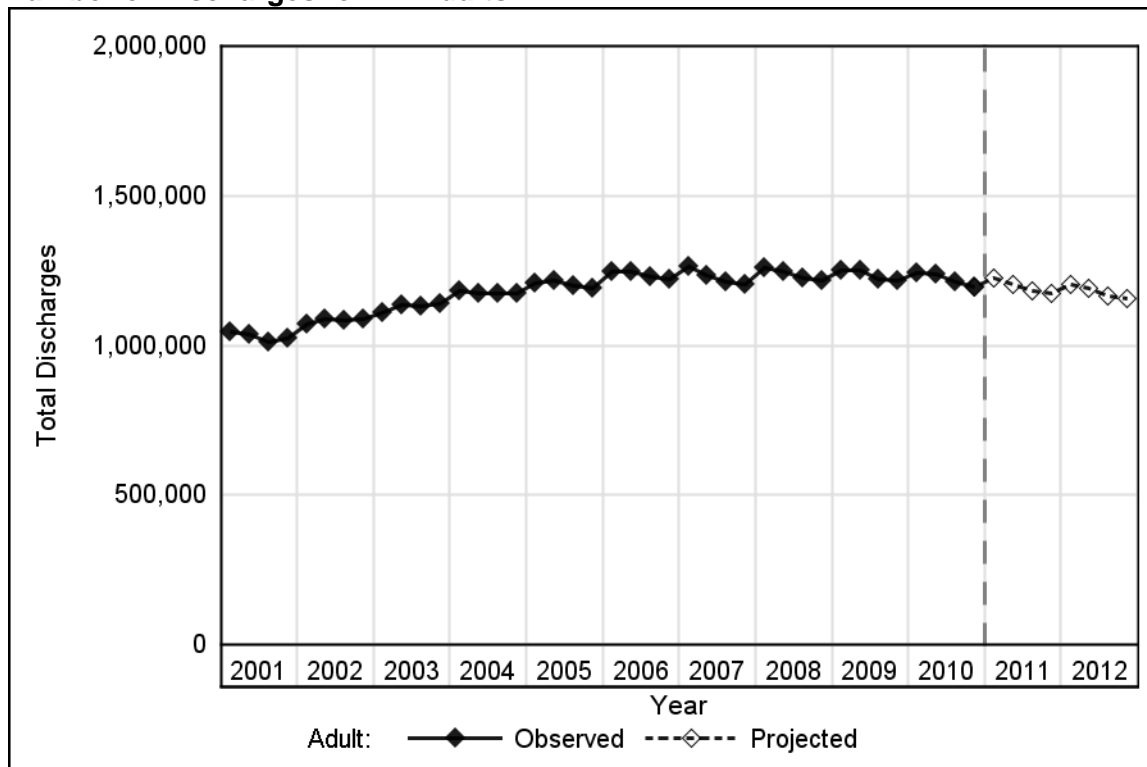
Cardiovascular/Cerebrovascular Procedures

Number of Discharges

Key Findings:

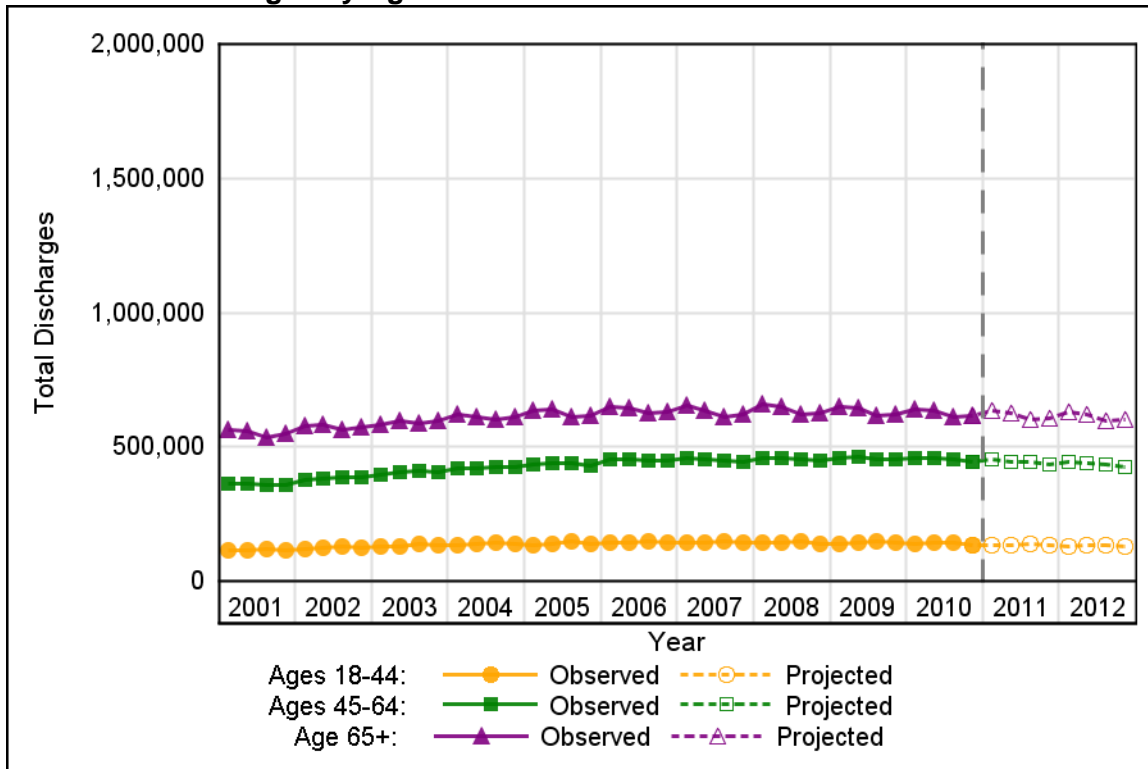
- The number of discharges for cardiovascular and cerebrovascular procedures increased from 1.0 million discharges per quarter in 2001 to 1.2 million discharges per quarter in 2006, and then remained relatively stable through 2010. Discharges are projected to remain relatively stable at about this same level in 2011 and 2012.
- Adults age 65 and older had the highest discharges, at about 551,500 discharges per quarter in 2001, increasing to 638,000 discharges per quarter in 2006, and then remaining relatively stable through 2010. Adults ages 45 to 64 had the next highest discharges, at about 360,500 discharges per quarter in 2001, increasing to 451,500 discharges per quarter in 2006, and then remaining relatively stable through 2010. Adults ages 18 to 44 had the lowest discharges, at about 116,500 discharges per quarter in 2001, increasing to 144,500 discharges per quarter in 2006, and then remaining relatively stable through 2010.
- Males had about 96,500 more discharges per quarter than did females. Males had about 562,000 discharges per quarter in 2001, increasing to 670,500 discharges per quarter in 2006, and then remaining relatively stable through 2010. Females had about 466,500 discharges per quarter in 2001, increasing to 564,000 discharges per quarter in 2006, and remaining relatively stable through 2010.

Number of Discharges for All Adults

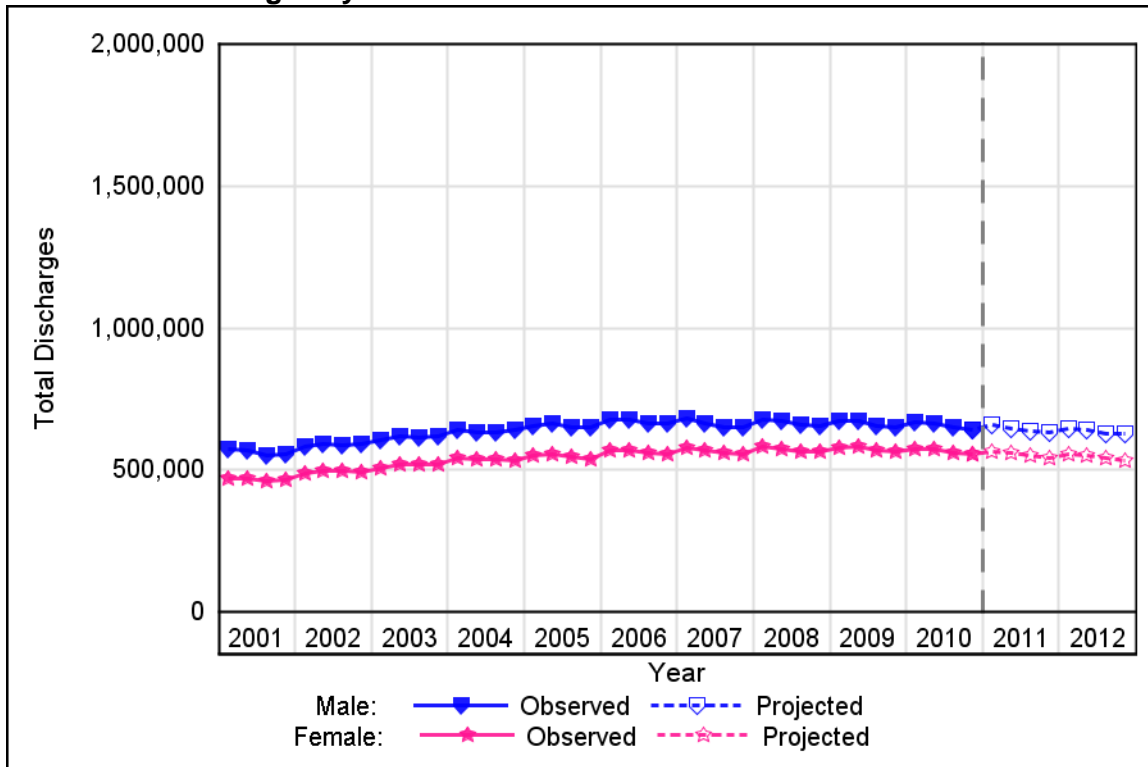


Source: Agency for Healthcare Research and Quality, Center for Delivery, Organization, and Markets, Healthcare Cost and Utilization Project, State Inpatient Databases.

Number of Discharges by Age



Number of Discharges by Gender



Source: Agency for Healthcare Research and Quality, Center for Delivery, Organization, and Markets, Healthcare Cost and Utilization Project, State Inpatient Databases.

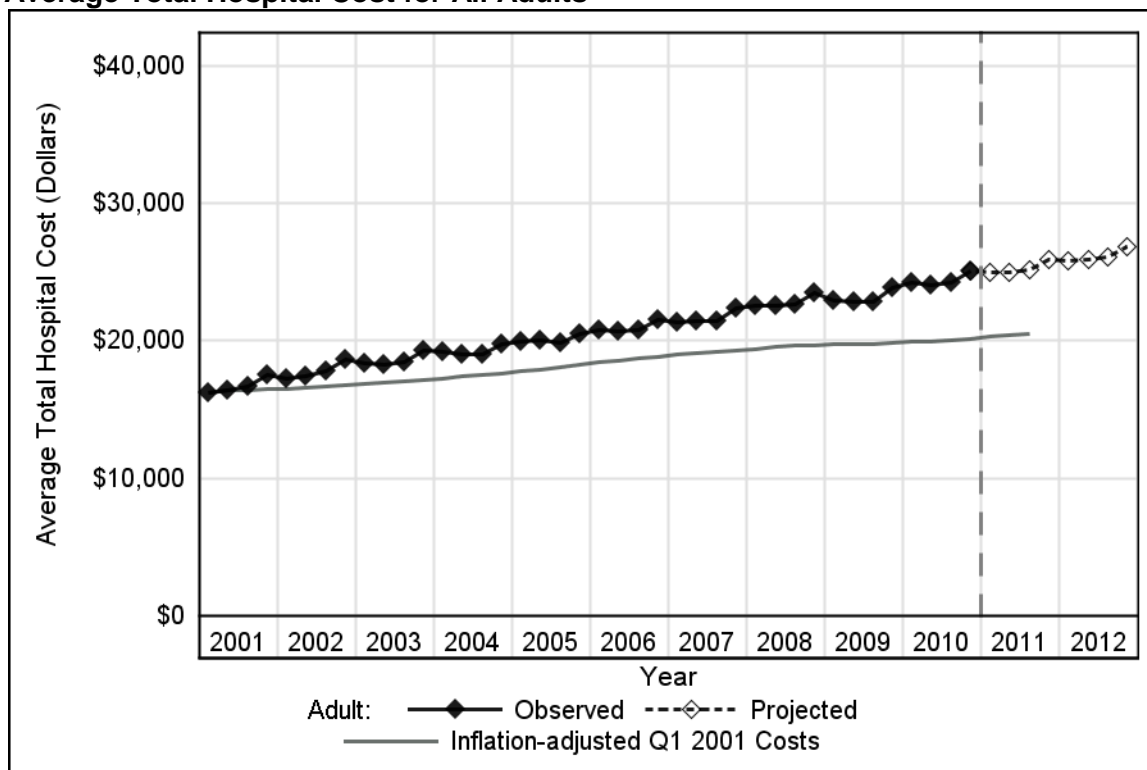
Cardiovascular/Cerebrovascular Procedures

Average Total Hospital Cost

Key Findings:

- The average hospital cost for cardiovascular and cerebrovascular procedures increased over time, from about \$16,500 in 2001 to \$24,500 in 2010. This increasing trend is projected to continue in 2011 and 2012, with the average hospital cost projected to be about \$27,000 at the end of 2012.
- The average hospital cost was similar for all three age groups, increasing from about \$17,000 in 2001 to \$24,500 in 2010.
- The average hospital cost was similar for males and females, increasing from about \$16,500 in 2001 to \$24,500 in 2010.
- Using the Gross Domestic Product (GDP) price index, a cost of \$16,500 in 2001 would be equivalent to a cost of \$20,500 in 2010. By 2010, the average hospital cost exceeded the cost expected by inflation alone.

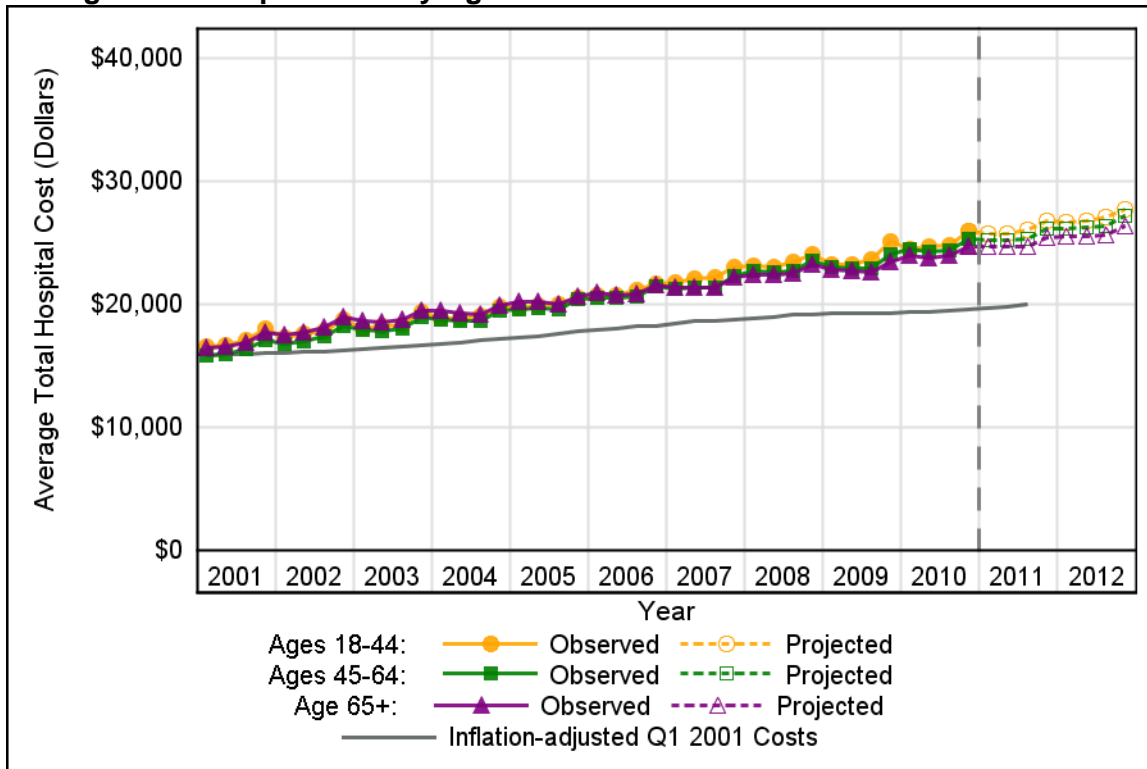
Average Total Hospital Cost for All Adults



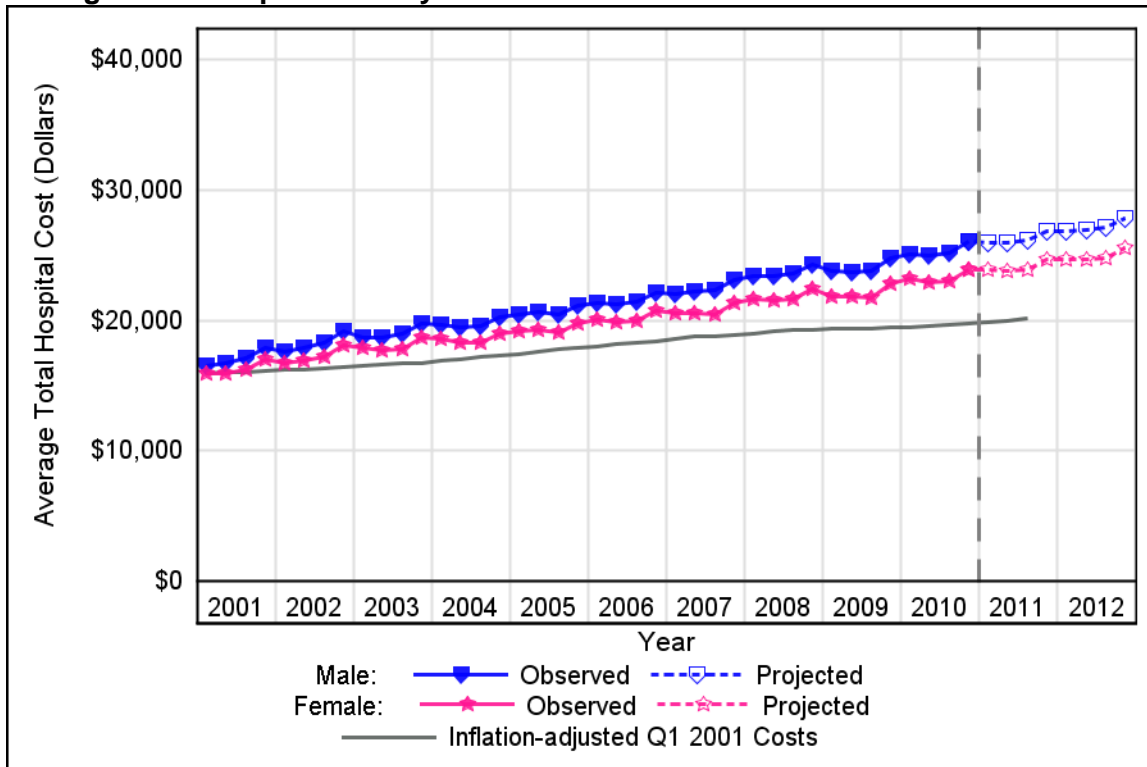
Inflation-adjusted Q1 2001 Costs: Cost per admission in the first quarter of 2001, adjusted for economy-wide inflation.

Source: Agency for Healthcare Research and Quality, Center for Delivery, Organization, and Markets, Healthcare Cost and Utilization Project, State Inpatient Databases.

Average Total Hospital Cost by Age



Average Total Hospital Cost by Gender



Inflation-adjusted Q1 2001 Costs: Cost per admission in the first quarter of 2001, adjusted for economy-wide inflation. Source: Agency for Healthcare Research and Quality, Center for Delivery, Organization, and Markets, Healthcare Cost and Utilization Project, State Inpatient Databases.

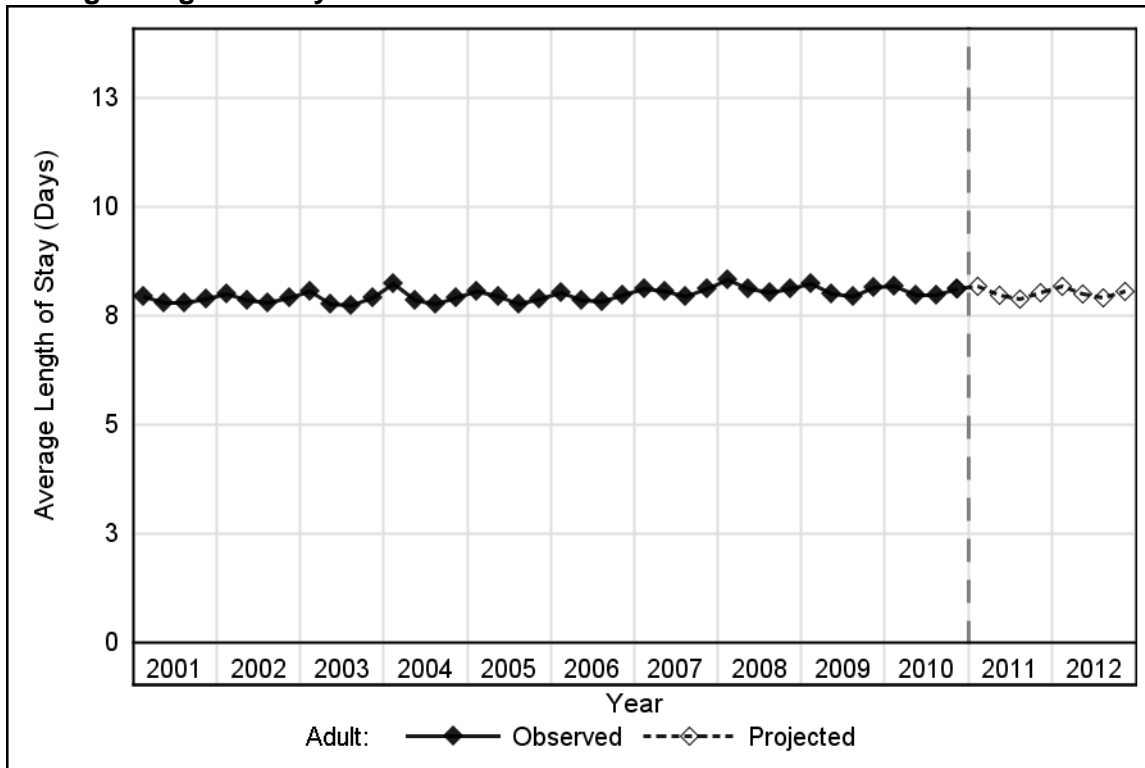
Cardiovascular/Cerebrovascular Procedures

Average Length of Stay

Key Findings:

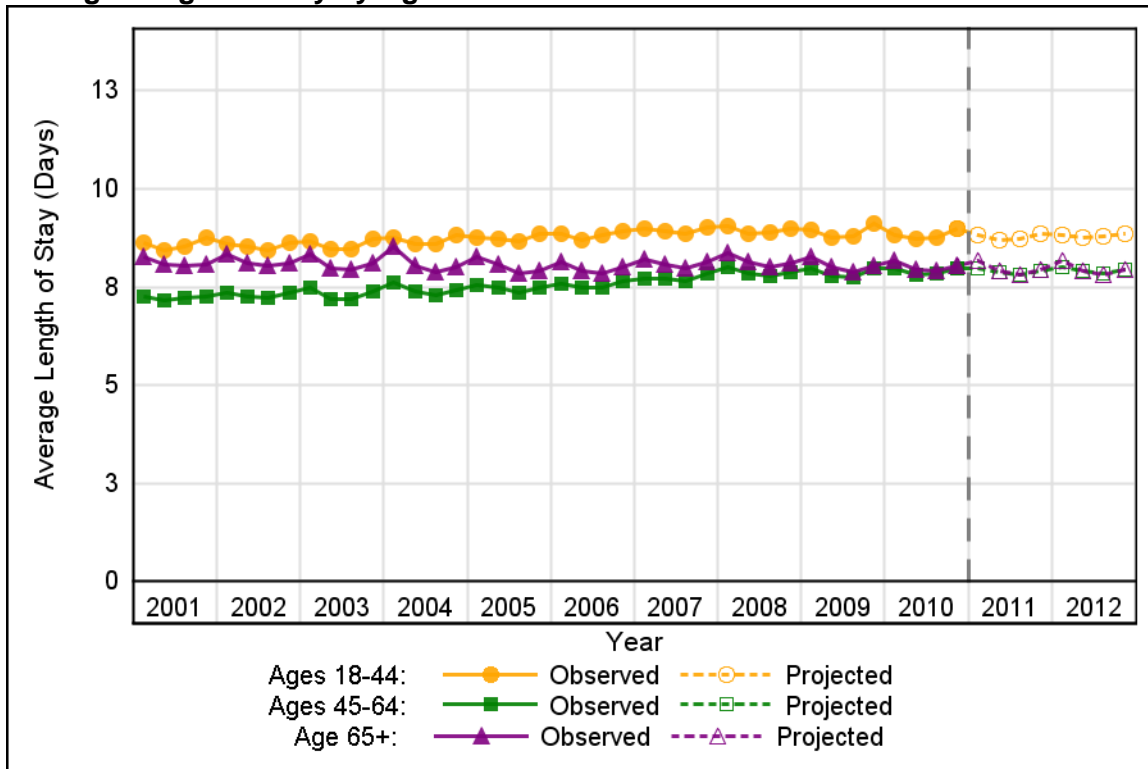
- The length of stay for discharges with cardiovascular and cerebrovascular procedures was relatively stable between 2001 and 2010 at 8.0 days. Length of stay is projected to remain at about this same level in 2011 and 2012.
- Length of stay was relatively stable over time for all three age groups. Adults ages 18 to 44 had the longest length of stay at 8.8 days. Length of stay was 0.9 days longer for adults age 65 and older in 2001 (8.1 days) than for adults ages 45 to 64 (7.2 days). However, this initial difference diminished over time, with both older age groups have a similar length of stay in 2010 at around 8.0 days.
- Length of stay was 0.8 days longer for females than for males, and remained relatively stable for both genders over time. Females had a length of stay of 8.4 days. Males had a length of stay of 7.6 days.

Average Length of Stay for All Adults

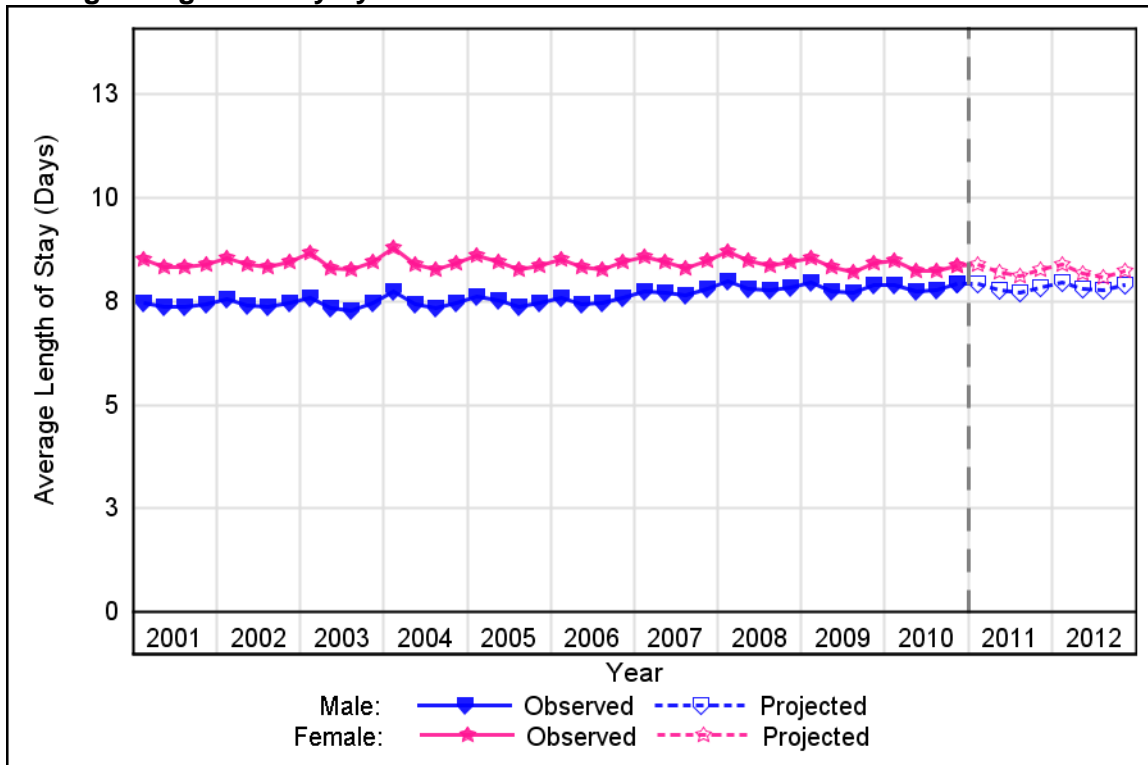


Source: Agency for Healthcare Research and Quality, Center for Delivery, Organization, and Markets, Healthcare Cost and Utilization Project, State Inpatient Databases.

Average Length of Stay by Age



Average Length of Stay by Gender



Source: Agency for Healthcare Research and Quality, Center for Delivery, Organization, and Markets, Healthcare Cost and Utilization Project, State Inpatient Databases.

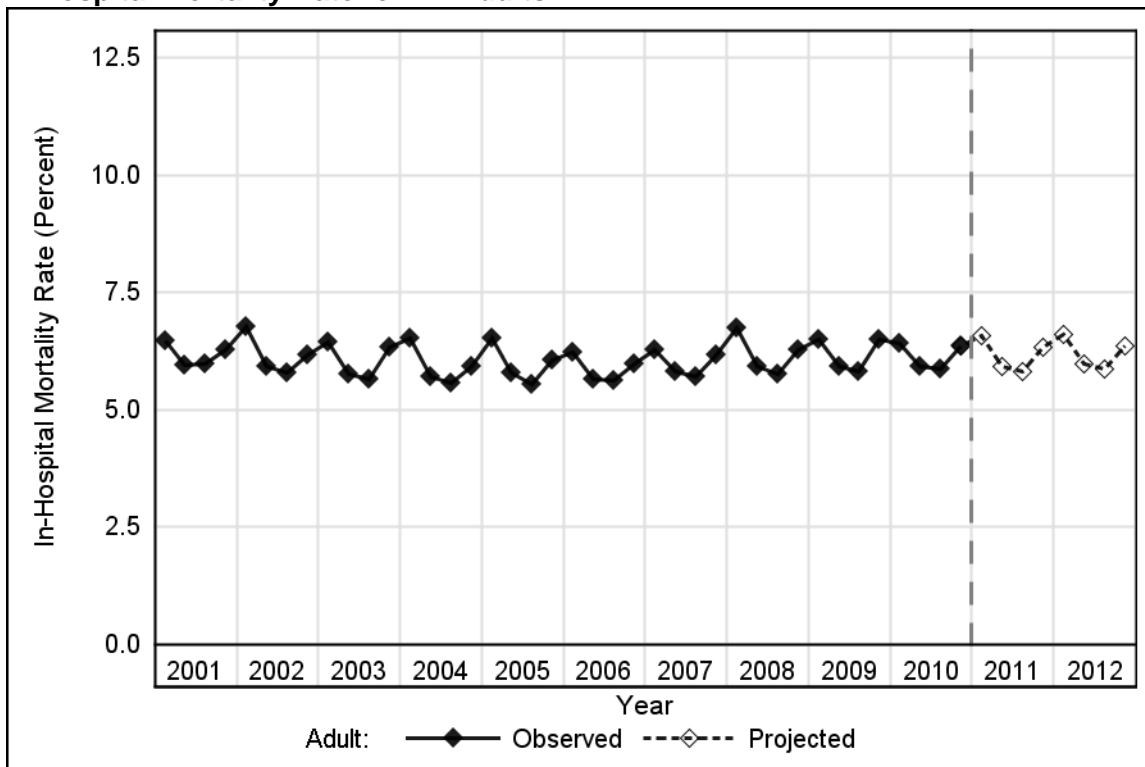
Cardiovascular/Cerebrovascular Procedures

In-Hospital Mortality Rate

Key Findings:

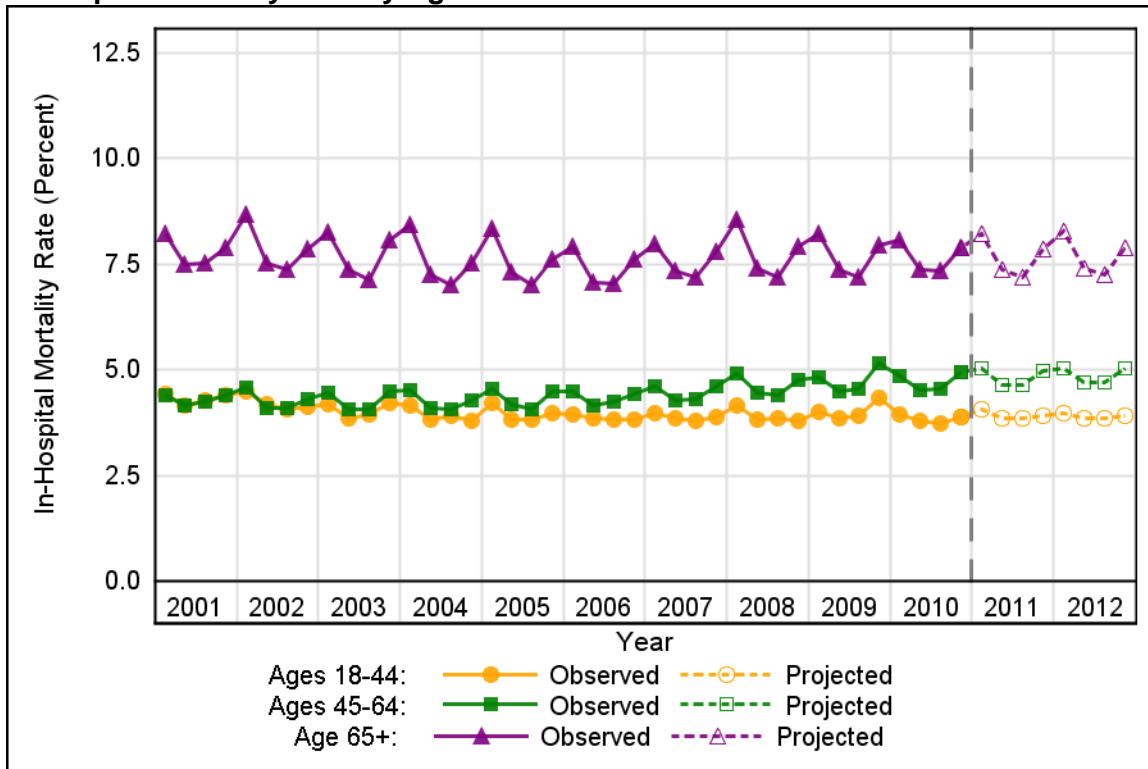
- The mortality rate for discharges with cardiovascular and cerebrovascular procedures vacillated around 6.1 percent between 2001 and 2010. The mortality rate is projected to remain at this same level in 2011 and 2012.
- Adults age 65 and older had the highest mortality rate, vacillating around 7.7 percent between 2001 and 2010. Adults ages 45 to 64 had the next highest mortality rate, at 4.3 percent in 2001 and increasing to 4.7 percent in 2010. Adults ages 18 to 44 had the lowest mortality rate, at 4.3 percent in 2001 and decreasing to 3.9 percent in 2010.
- The mortality rate was 1.0 percentage point higher for females in 2001 than for males. Females had a mortality rate that vacillated around 6.7 percent in 2001. Males had a mortality rate that vacillated around 5.7 percent in 2001. However, this initial difference disappeared over time, with both genders having a mortality rate that vacillated around 6.2 percent in 2010.

In-Hospital Mortality Rate for All Adults

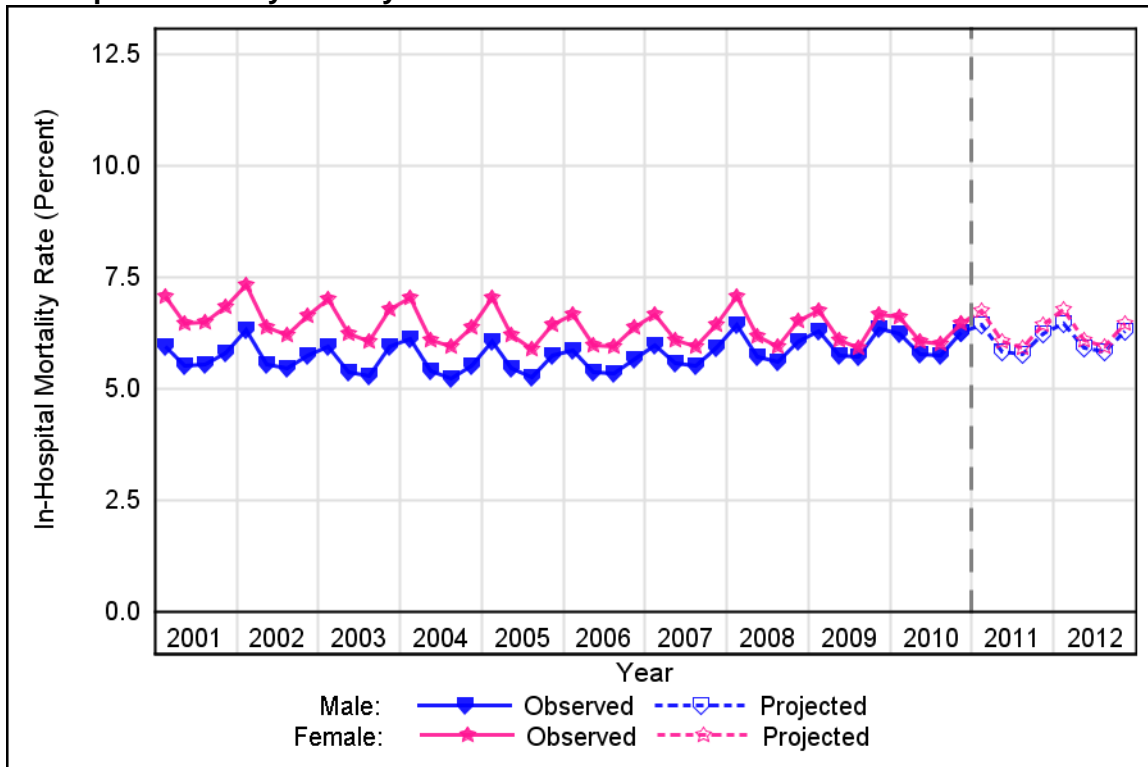


Source: Agency for Healthcare Research and Quality, Center for Delivery, Organization, and Markets, Healthcare Cost and Utilization Project, State Inpatient Databases.

In-Hospital Mortality Rate by Age



In-Hospital Mortality Rate by Gender



Source: Agency for Healthcare Research and Quality, Center for Delivery, Organization, and Markets, Healthcare Cost and Utilization Project, State Inpatient Databases.

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Coronary Artery Bypass Graft

Coronary artery bypass graft (CABG) is used to treat blocked heart arteries by grafting arteries or veins from other areas of the body to create new passages for blood to flow to the heart muscle. Using the HCUP SID from 2001 to 2010 and early 2011 data from 10 States, different outcomes for inpatient discharges with a CABG are projected for 2011 to 2012.

Projections include the following:

- Total inpatient discharges for all adults, adults by age group, and adults by gender. Discharge counts exclude inpatient stays that were transferred out to another acute care hospital. This ensures that these events are not double counted.
- Average total hospital cost for all adults, adults by age group, and adults by gender. Average total hospital cost reflects actual expenses incurred in the production of hospital services; physician costs are not included. For comparison, a line is included that depicts the change in the average inpatient hospital cost per admission in the first quarter of 2001 (Q1 2001) due solely to economy-wide inflation. The difference between the actual/projected cost line and the inflation-adjusted Q1 2001 cost line represents cost increases due to other non-inflation factors, such as new technology, patient case mix, etc.
- Average length of stay for all adults, adults by age group, and adults by gender. In HCUP, the length of stay counts nights spent in the hospital. If a patient is admitted and discharged on the same day, the length of stay is zero.
- In-hospital mortality rate for all adults, adults by age group, and adults by gender.

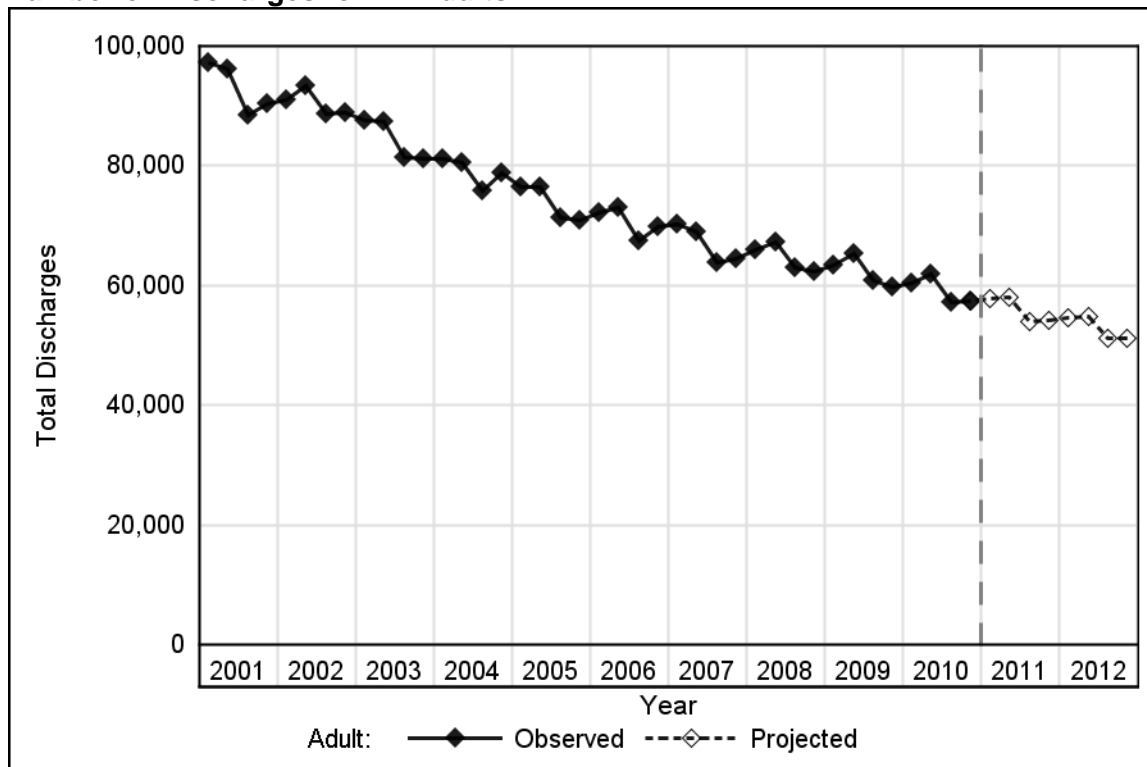
Coronary Artery Bypass Graft

Number of Discharges

Key Findings:

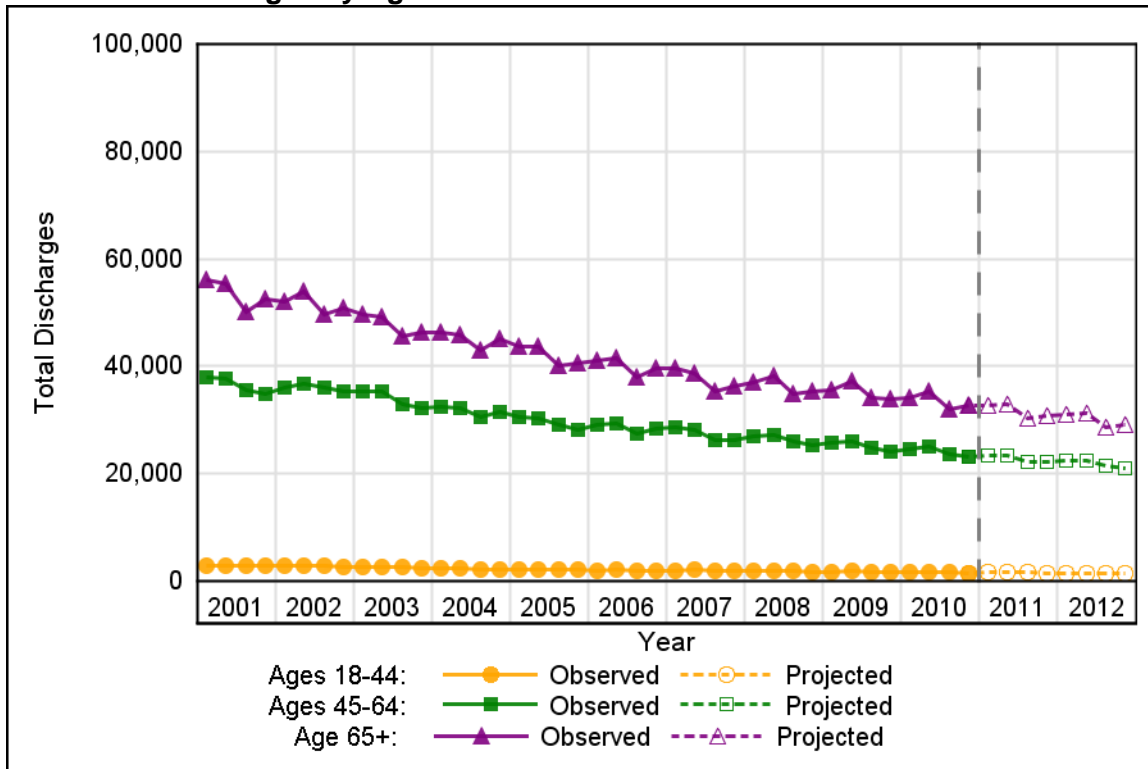
- The number of discharges for CABG decreased over time, from about 93,000 discharges per quarter in 2001 to 59,000 discharges per quarter in 2010. This decreasing trend is projected to continue in 2011 and 2012, with quarterly discharges projected to be about 51,000 at the end of 2012.
- Adults age 65 and older had the highest discharges, at about 53,500 discharges per quarter in 2001 and decreasing to 33,500 discharges per quarter in 2010. Adults ages 45 to 64 had the next highest discharges, at about 36,500 discharges per quarter in 2001 and decreasing to 24,000 discharges per quarter in 2010. Adults ages 18 to 44 had the lowest discharges, at about 3,000 discharges per quarter in 2001 and decreasing to 1,500 discharges per quarter in 2010.
- Males had about 31,000 more discharges per quarter than did females. Males had about 65,000 discharges per quarter in 2001, decreasing to 43,000 discharges per quarter in 2010. Females had about 28,000 discharges per quarter in 2001, decreasing to 16,500 discharges per quarter in 2010.

Number of Discharges for All Adults

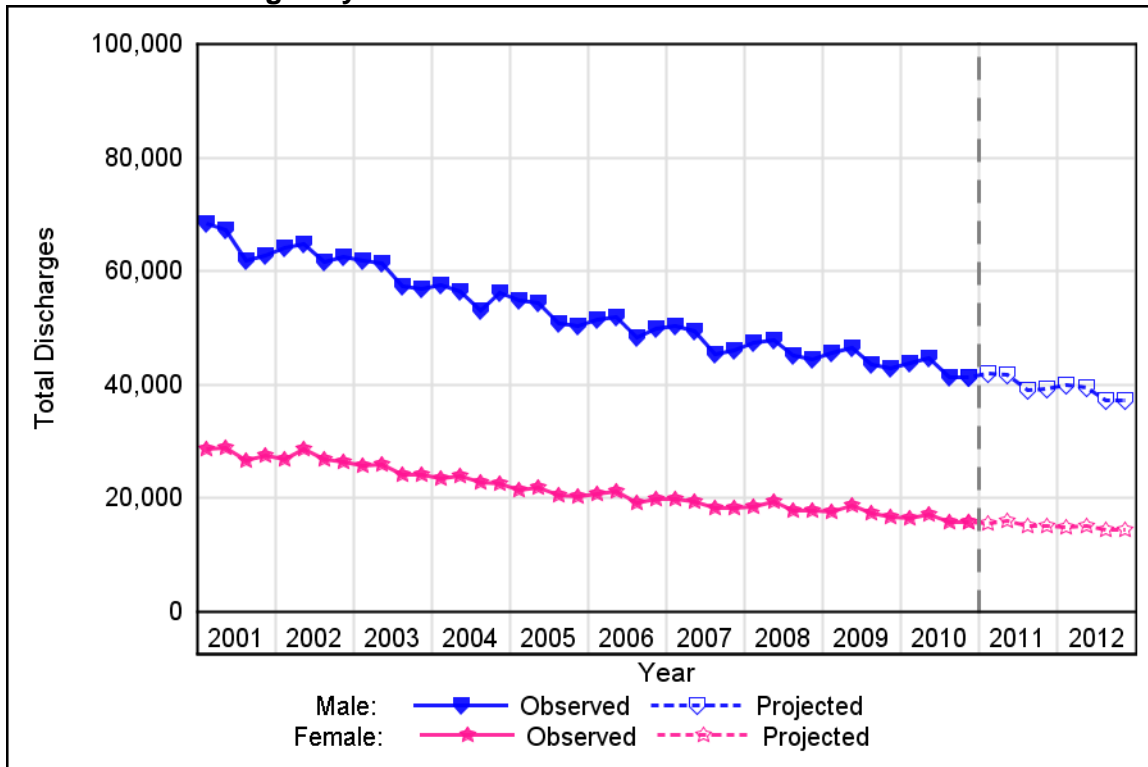


Source: Agency for Healthcare Research and Quality, Center for Delivery, Organization, and Markets, Healthcare Cost and Utilization Project, State Inpatient Databases.

Number of Discharges by Age



Number of Discharges by Gender



Source: Agency for Healthcare Research and Quality, Center for Delivery, Organization, and Markets, Healthcare Cost and Utilization Project, State Inpatient Databases.

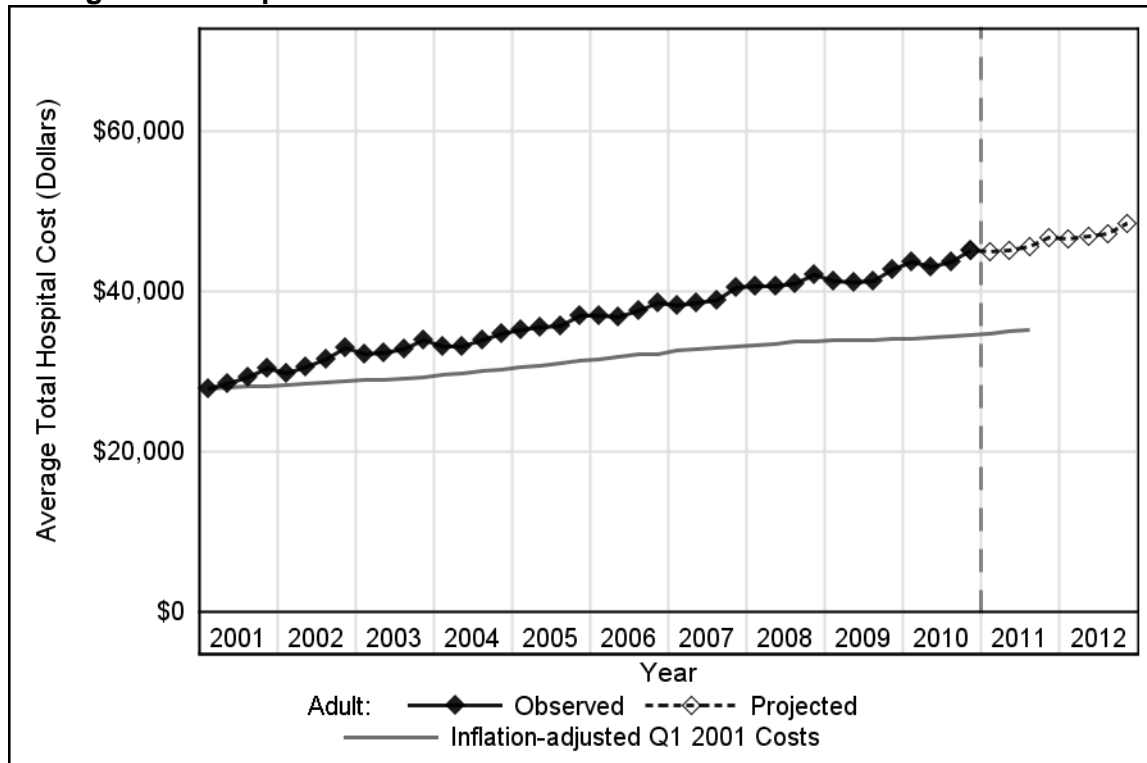
Coronary Artery Bypass Graft

Average Total Hospital Cost

Key Findings:

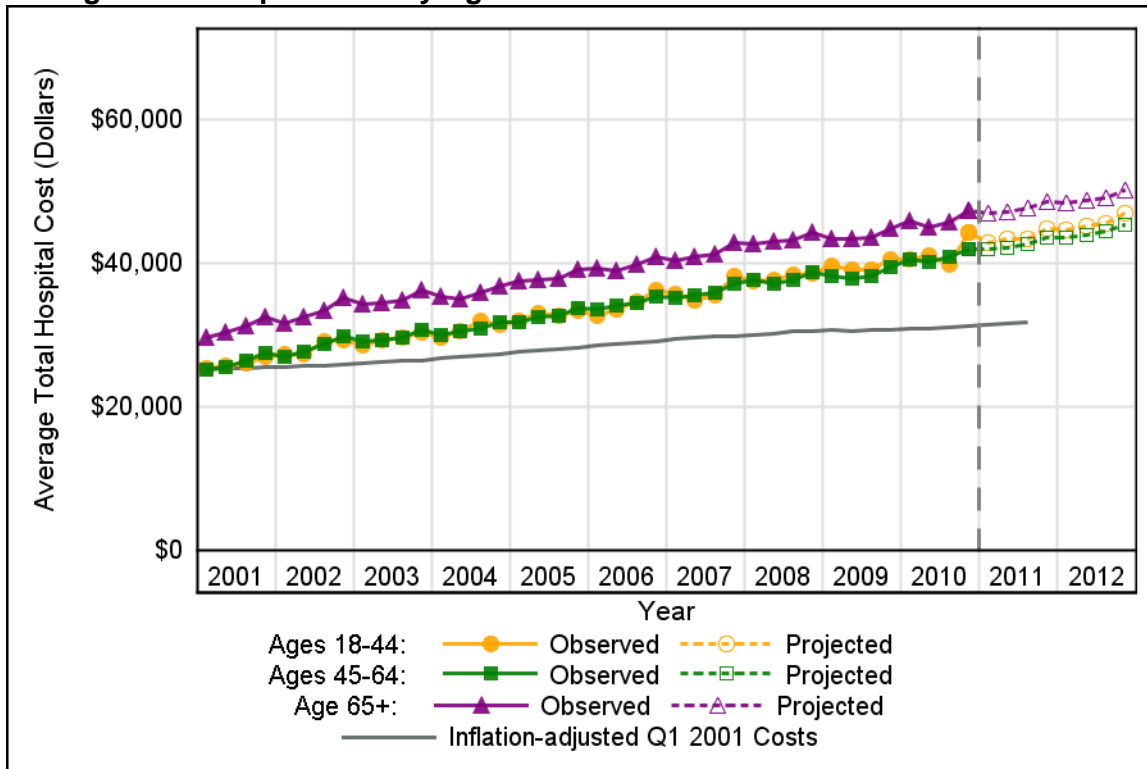
- The average hospital cost for discharges with CABG increased over time, from about \$29,000 in 2001 to \$44,000 in 2010. This increasing trend is projected to continue in 2011 and 2012, with the average hospital cost projected to be about \$48,500 at the end of 2012.
- The average hospital cost was highest for adults age 65 and older, increasing from about \$31,000 in 2001 to \$46,000 in 2010. The average hospital cost was similar for the two younger age groups, increasing from about \$26,000 in 2001 to \$41,000 in 2010.
- The average hospital cost was about \$4,000 higher for females than for males. Females had an average hospital cost that increased from about \$31,500 in 2001 to \$47,000 in 2010. Males had an average hospital cost that increased from about \$28,000 in 2001 to \$42,500 in 2010.
- Using the Gross Domestic Product (GDP) price index, a cost of \$29,000 in 2001 would be equivalent to a cost of \$36,000 in 2010. By 2010, the average hospital cost exceeded the cost expected by inflation alone.

Average Total Hospital Cost for All Adults

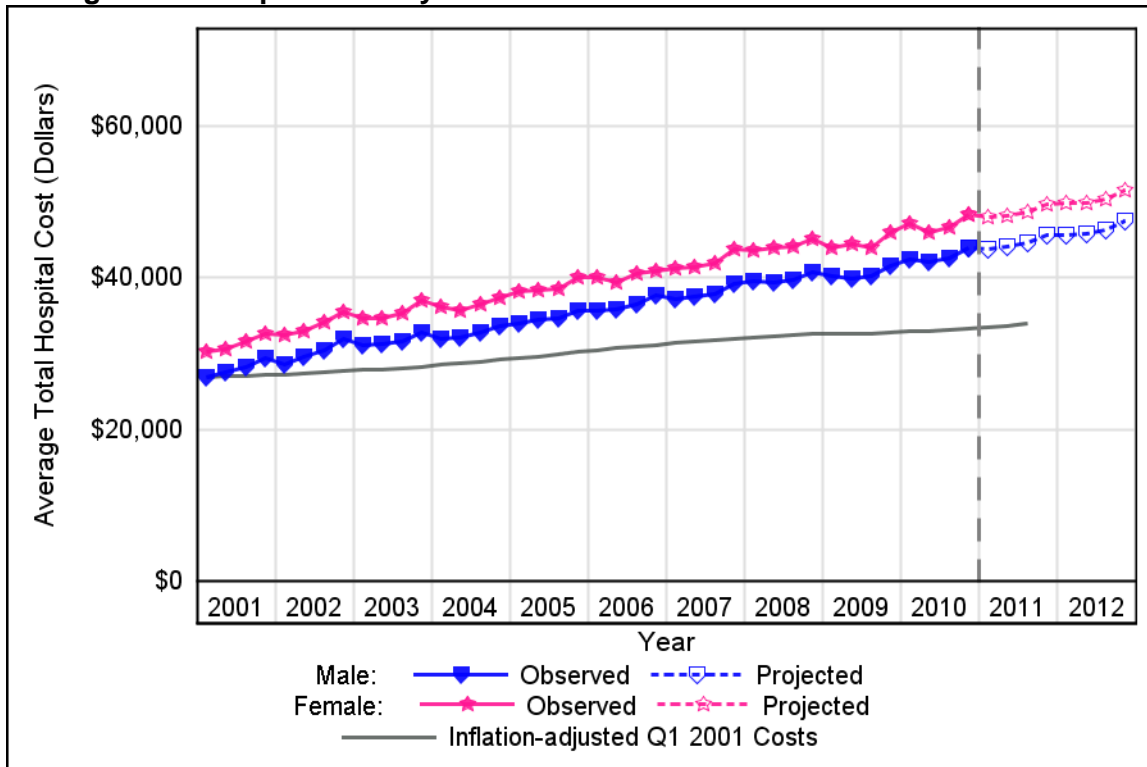


Inflation-adjusted Q1 2001 Costs: Cost per admission in the first quarter of 2001, adjusted for economy-wide inflation.
Source: Agency for Healthcare Research and Quality, Center for Delivery, Organization, and Markets, Healthcare Cost and Utilization Project, State Inpatient Databases.

Average Total Hospital Cost by Age



Average Total Hospital Cost by Gender



Inflation-adjusted Q1 2001 Costs: Cost per admission in the first quarter of 2001, adjusted for economy-wide inflation. Source: Agency for Healthcare Research and Quality, Center for Delivery, Organization, and Markets, Healthcare Cost and Utilization Project, State Inpatient Databases.

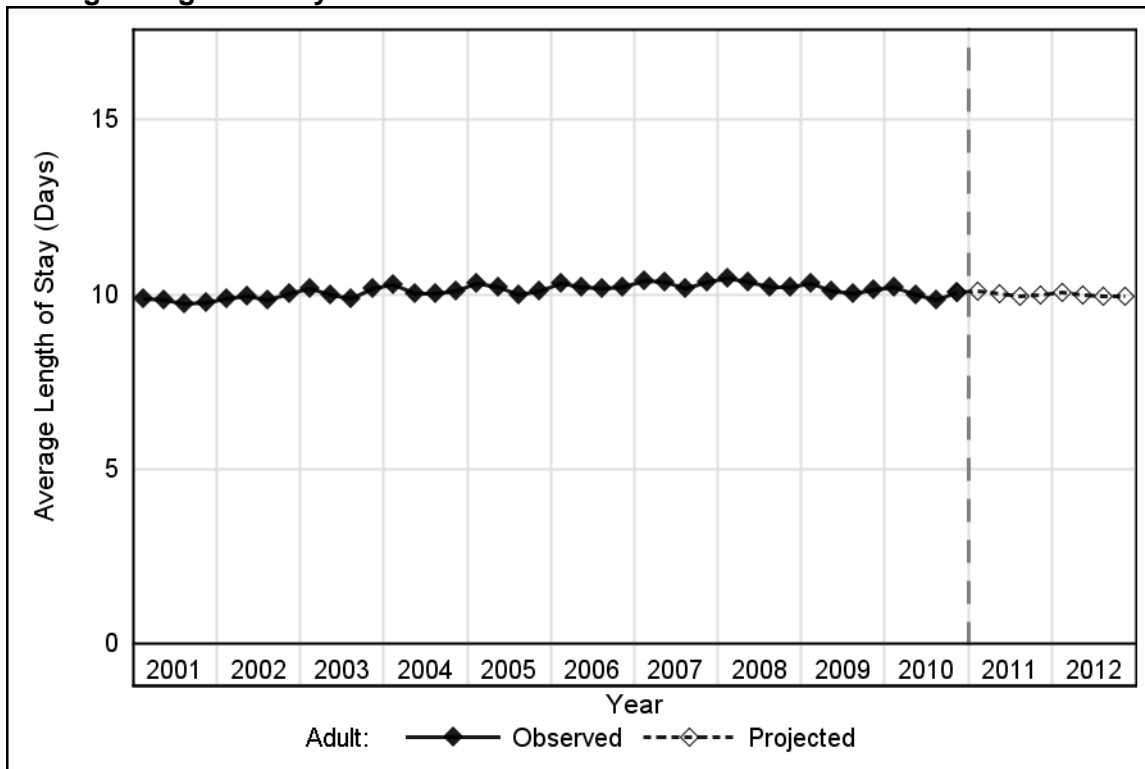
Coronary Artery Bypass Graft

Average Length of Stay

Key Findings:

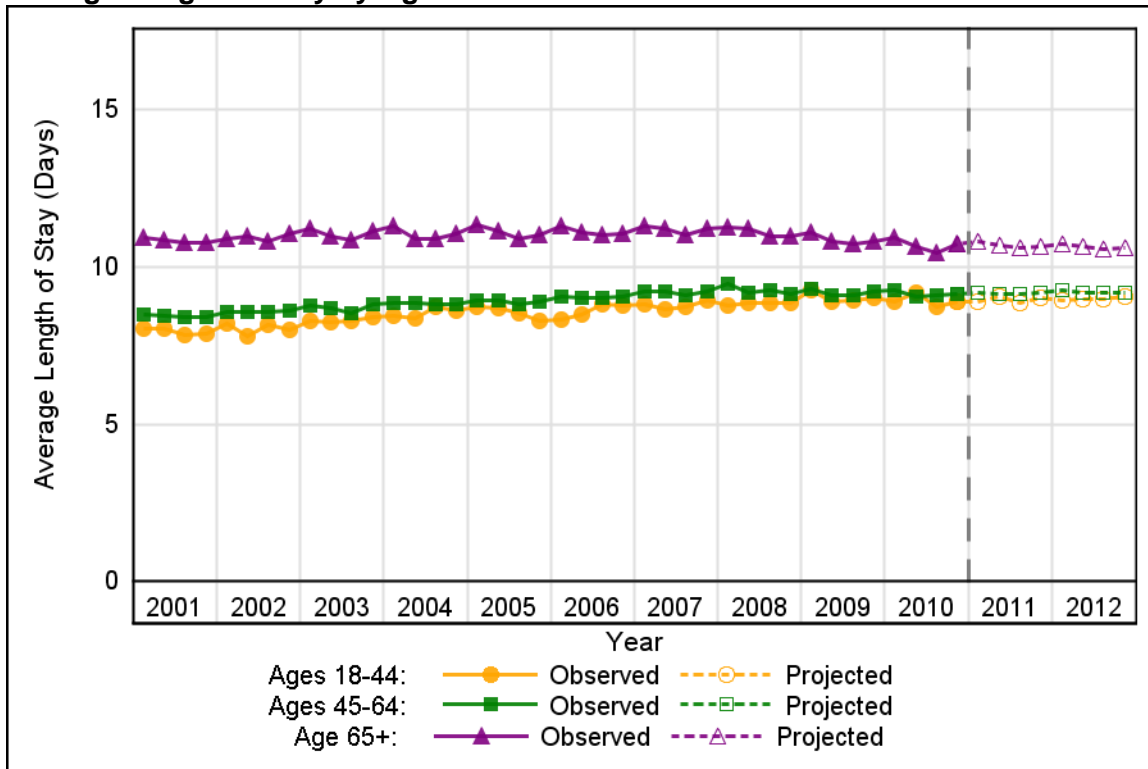
- The length of stay for discharges with CABG was relatively stable between 2001 and 2010 at 10.1 days. Length of stay is projected to remain at about this same level in 2011 and 2012.
- Length of stay was relatively stable over time for all three age groups. Adults age 65 and older had the longest length of stay at 11.0 days. The two younger age groups had similar lengths of stay at around 8.7 days.
- Length of stay was 1.8 days longer for females than for males, and remained relatively stable for both genders over time. Females had a length of stay of 11.4 days. Males had a length of stay of 9.6 days.

Average Length of Stay for All Adults

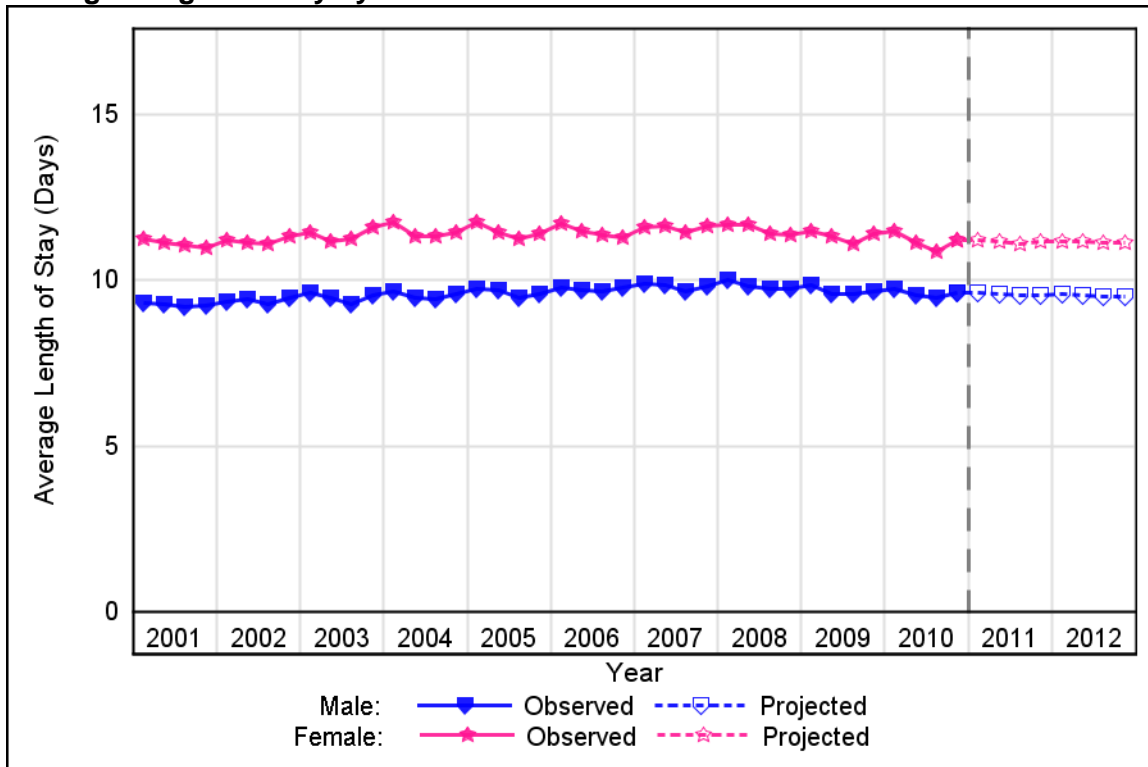


Source: Agency for Healthcare Research and Quality, Center for Delivery, Organization, and Markets, Healthcare Cost and Utilization Project, State Inpatient Databases.

Average Length of Stay by Age



Average Length of Stay by Gender



Source: Agency for Healthcare Research and Quality, Center for Delivery, Organization, and Markets, Healthcare Cost and Utilization Project, State Inpatient Databases.

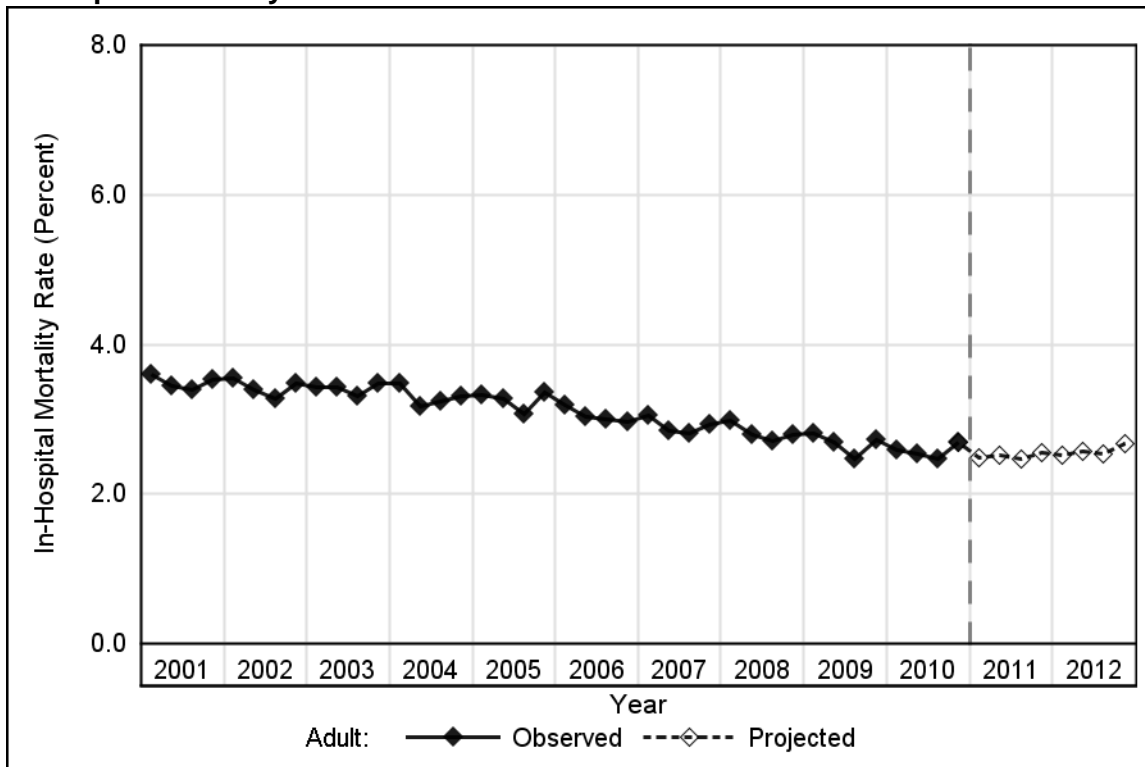
Coronary Artery Bypass Graft

In-Hospital Mortality Rate

Key Findings:

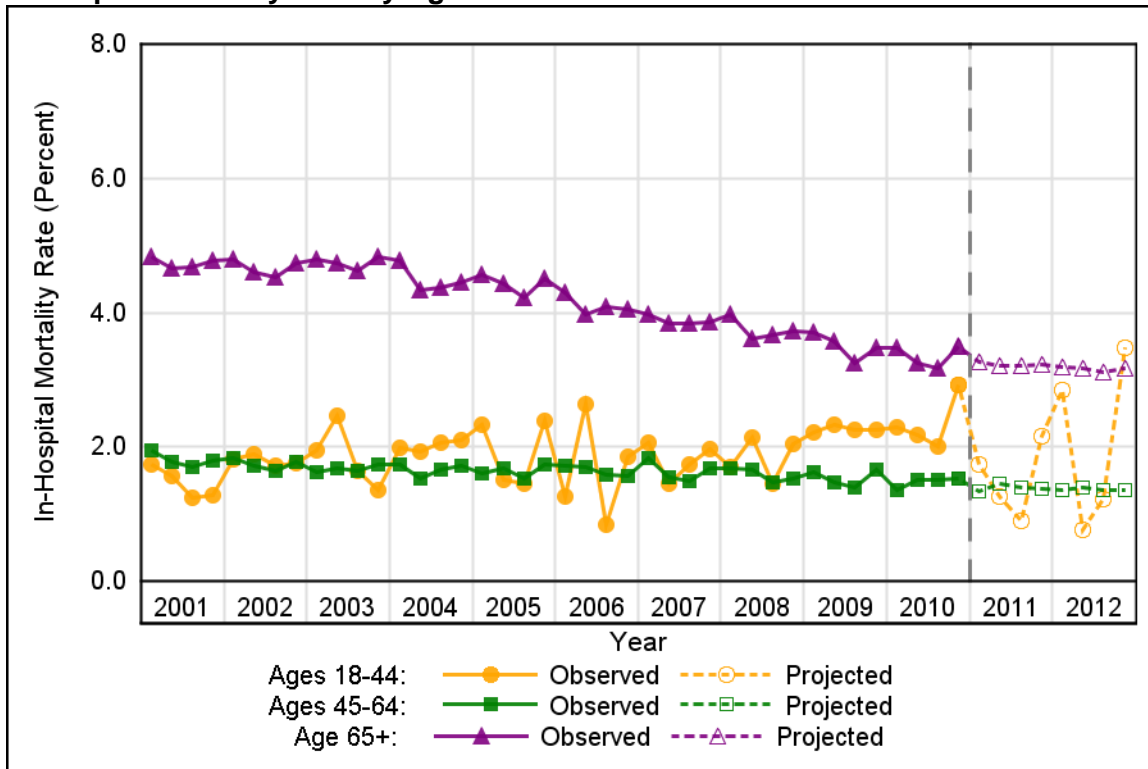
- The mortality rate for discharges with CABG decreased over time, from 3.5 percent in 2001 to 2.6 percent in 2010. The mortality rate is projected to remain relatively stable at about this same level in 2011 and 2012.
- Adults age 65 and older had the highest mortality rate, at 4.8 percent in 2001 and decreasing to 3.4 percent in 2010. Adults ages 45 to 64 had next highest mortality rate, at 1.8 percent in 2001 and decreasing to 1.5 percent in 2010. The mortality rate for adults ages 18 to 44 was erratic due to the small number of discharges among this age group (about 2,000 per quarter).
- The mortality rate was 2.0 percentage points higher for females than for males. Females had a mortality rate that decreased from 5.0 percent in 2001 to 3.8 percent in 2010. Males had a mortality rate that decreased from 2.9 percent in 2001 to 2.1 percent in 2010.

In-Hospital Mortality Rate for All Adults

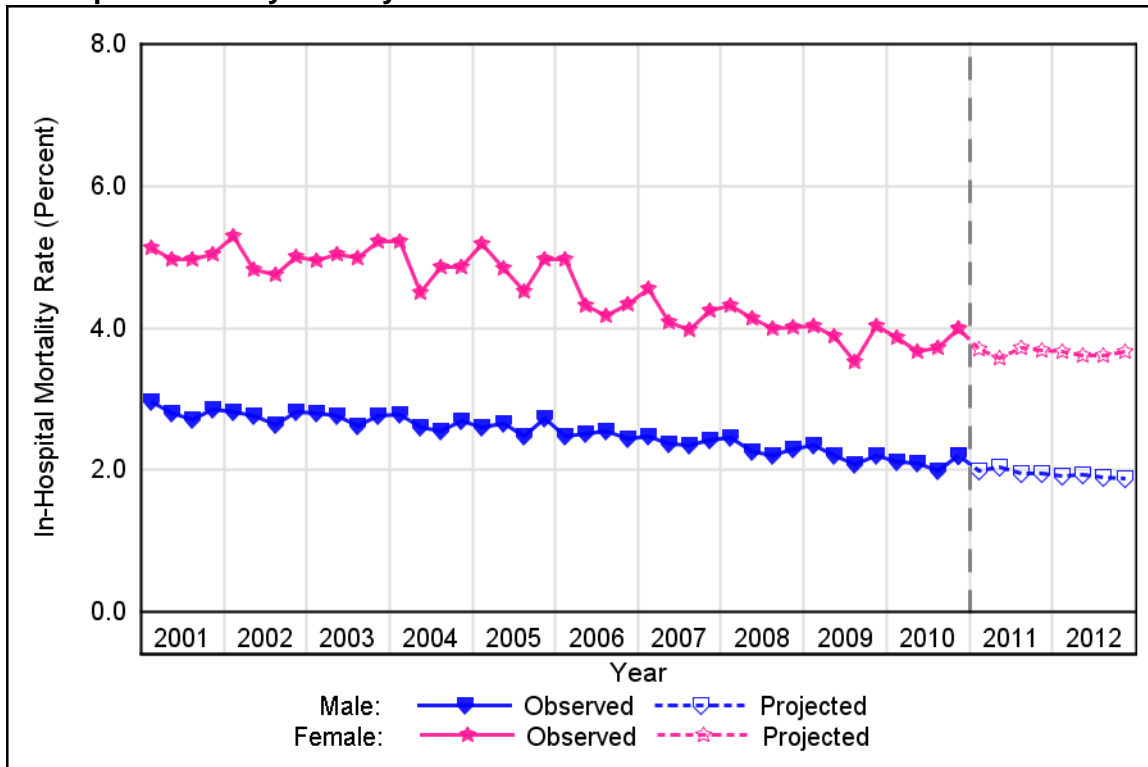


Source: Agency for Healthcare Research and Quality, Center for Delivery, Organization, and Markets, Healthcare Cost and Utilization Project, State Inpatient Databases.

In-Hospital Mortality Rate by Age



In-Hospital Mortality Rate by Gender



Source: Agency for Healthcare Research and Quality, Center for Delivery, Organization, and Markets, Healthcare Cost and Utilization Project, State Inpatient Databases.

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Percutaneous Transluminal Coronary Angioplasty without Stents

Percutaneous transluminal coronary angioplasty (PTCA) is used to treat narrowed coronary arteries. This procedure threads special tubing with an attached deflated balloon into the coronary arteries and then inflates the balloon to help clear the blocked areas. Using the HCUP SID from 2001 to 2010 and early 2011 data from 10 States, different outcomes for inpatient discharges with PTCA without a stent are projected for 2011 to 2012.

Projections include the following:

- Total inpatient discharges for all adults, adults by age group, and adults by gender. Discharge counts exclude inpatient stays that were transferred out to another acute care hospital. This ensures that these events are not double counted.
- Average total hospital cost for all adults, adults by age group, and adults by gender. Average total hospital cost reflects actual expenses incurred in the production of hospital services; physician costs are not included. For comparison, a line is included that depicts the change in the average inpatient hospital cost per admission in the first quarter of 2001 (Q1 2001) due solely to economy-wide inflation. The difference between the actual/projected cost line and the inflation-adjusted Q1 2001 cost line represents cost increases due to other non-inflation factors, such as new technology, patient case mix, etc.
- Average length of stay for all adults, adults by age group, and adults by gender. In HCUP, the length of stay counts nights spent in the hospital. If a patient is admitted and discharged on the same day, the length of stay is zero.
- In-hospital mortality rate for all adults, adults by age group, and adults by gender.

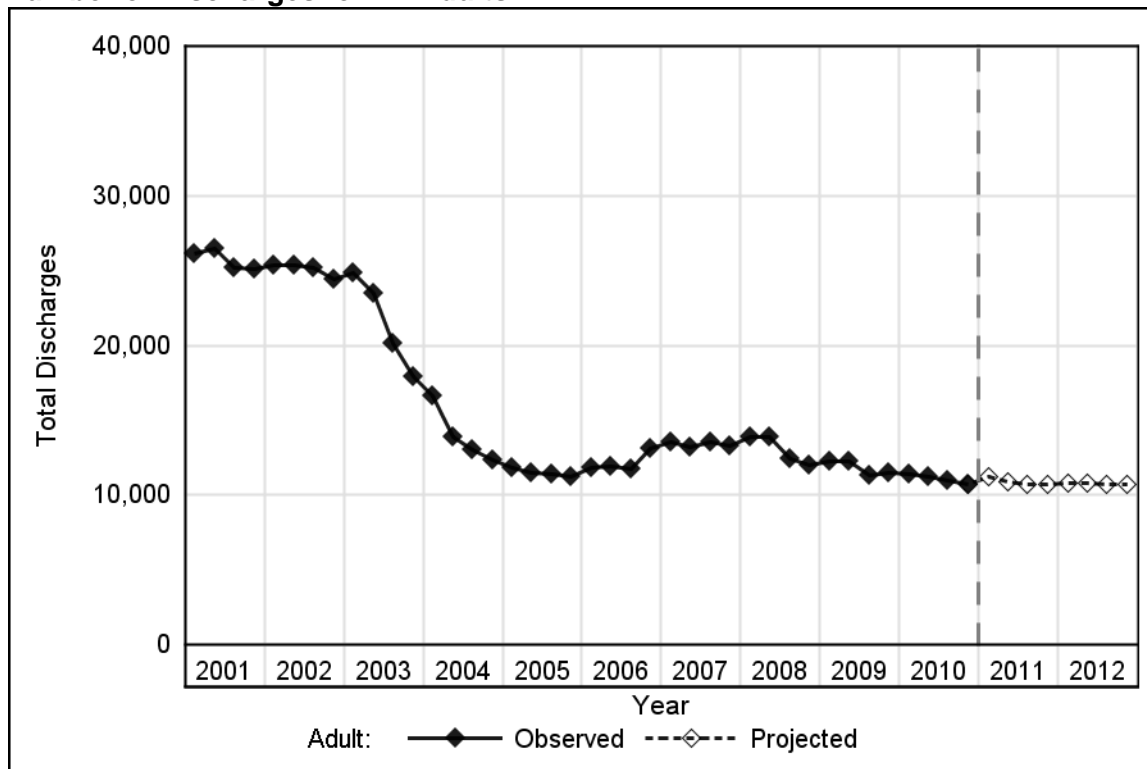
Percutaneous Transluminal Coronary Angioplasty without Stents

Number of Discharges

Key Findings:

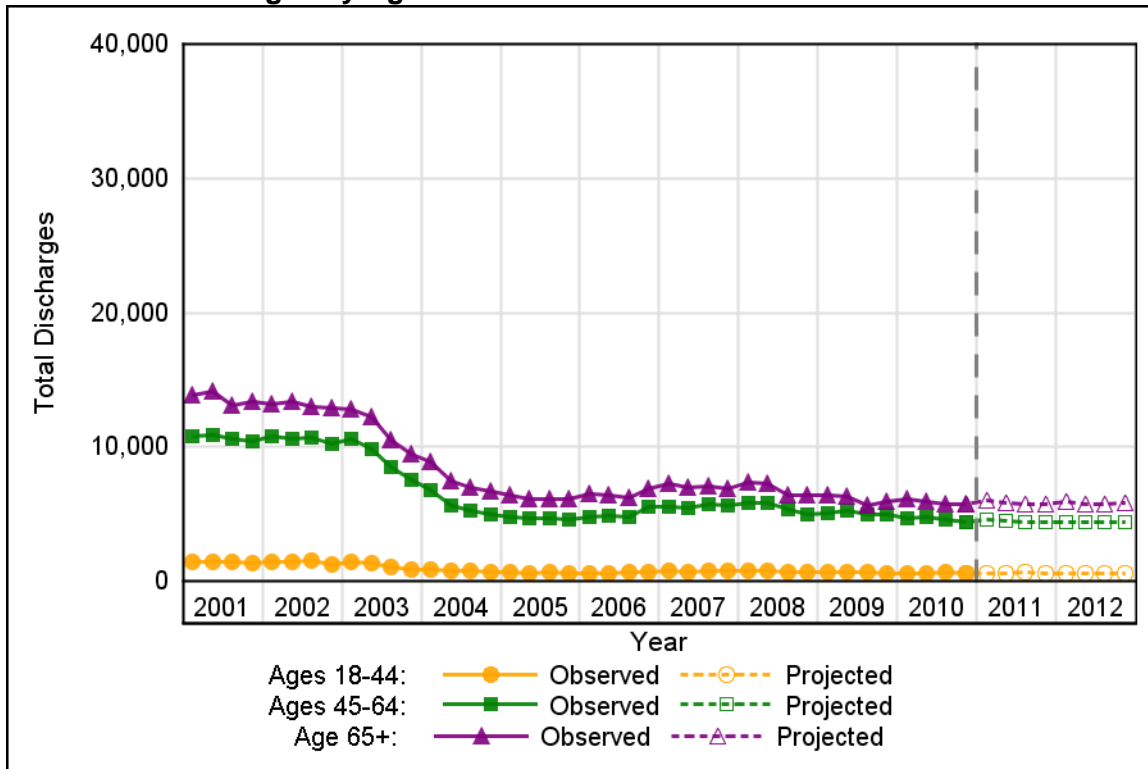
- The number of discharges for PTCA without stents decreased from about 25,500 discharges per quarter in 2001 to 14,000 discharges per quarter in 2004, and then remained relatively stable at about 12,500 discharges per quarter through 2010. Discharges are projected at about 11,000 discharges per quarter in 2011 and 2012.
- Discharges for all three age groups decreased between 2001 and 2004, and then remained relatively stable through 2010. For adults age 65 and older, quarterly discharges decreased from about 13,500 in 2001 to 7,500 in 2004 and remained relatively stable at 6,500 through 2010. For adults ages 45 to 64, quarterly discharges decreased from about 10,500 in 2001 to 5,500 in 2004 and remained relatively stable at 5,000 through 2010. For adults ages 18 to 44, quarterly discharges decreased from about 1,500 in 2001 to 1,000 in 2004 and remained relatively stable at 500 through 2010.
- Discharges for both genders decreased between 2001 and 2004, and then remained relatively stable through 2010. For males, quarterly discharges decreased from about 16,500 in 2001 to 9,000 in 2004 and remained relatively stable at 8,000 through 2010. For females, quarterly discharges decreased from about 9,500 in 2001 to 5,000 in 2004 and remained relatively stable at 4,500 through 2010.

Number of Discharges for All Adults

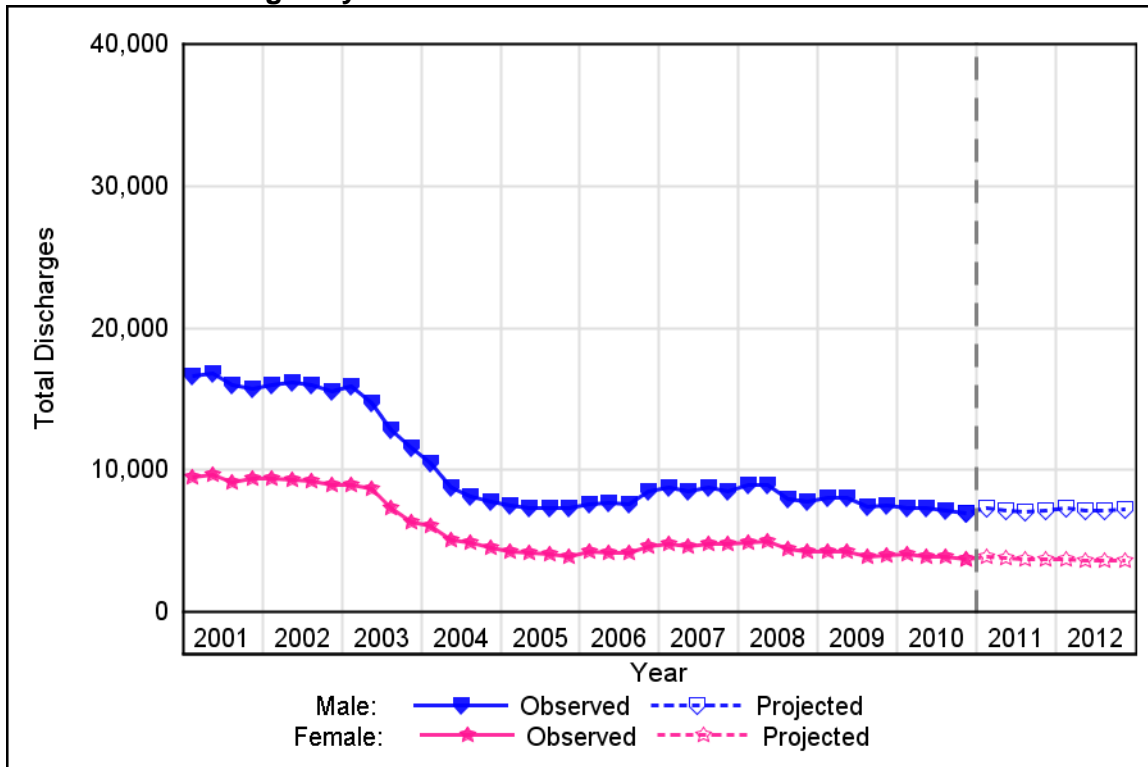


Source: Agency for Healthcare Research and Quality, Center for Delivery, Organization, and Markets, Healthcare Cost and Utilization Project, State Inpatient Databases.

Number of Discharges by Age



Number of Discharges by Gender



Source: Agency for Healthcare Research and Quality, Center for Delivery, Organization, and Markets, Healthcare Cost and Utilization Project, State Inpatient Databases.

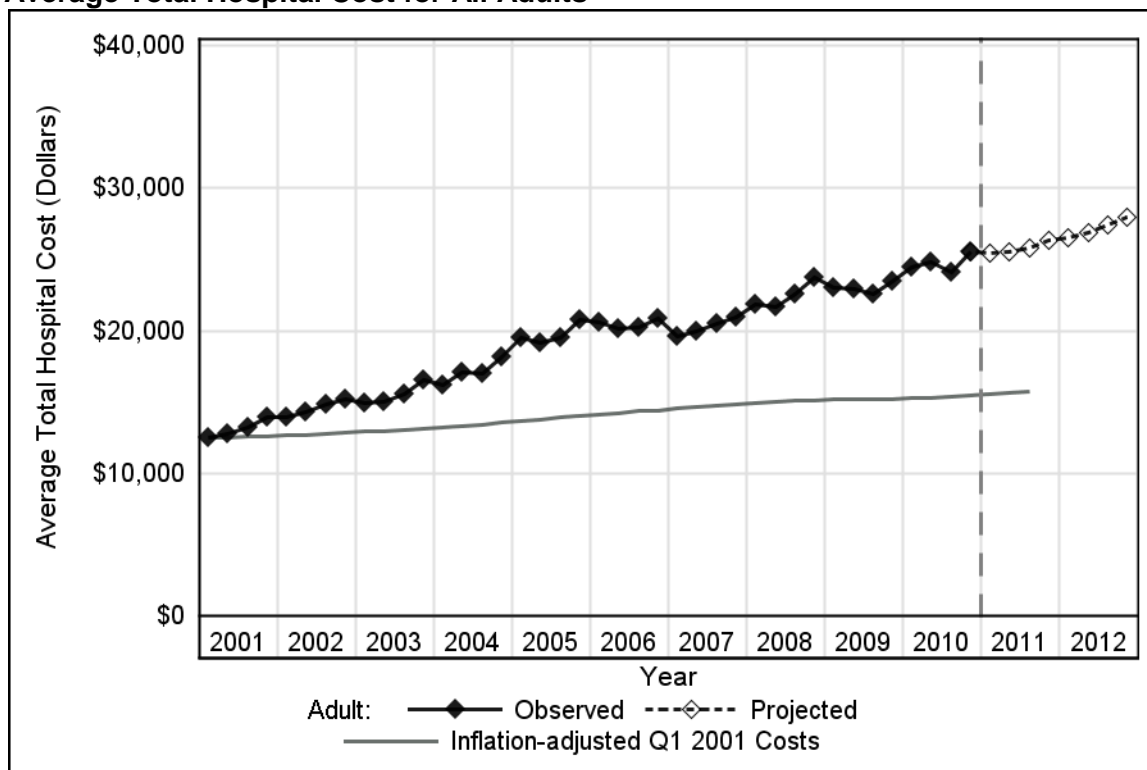
Percutaneous Transluminal Coronary Angioplasty without Stents

Average Total Hospital Cost

Key Findings:

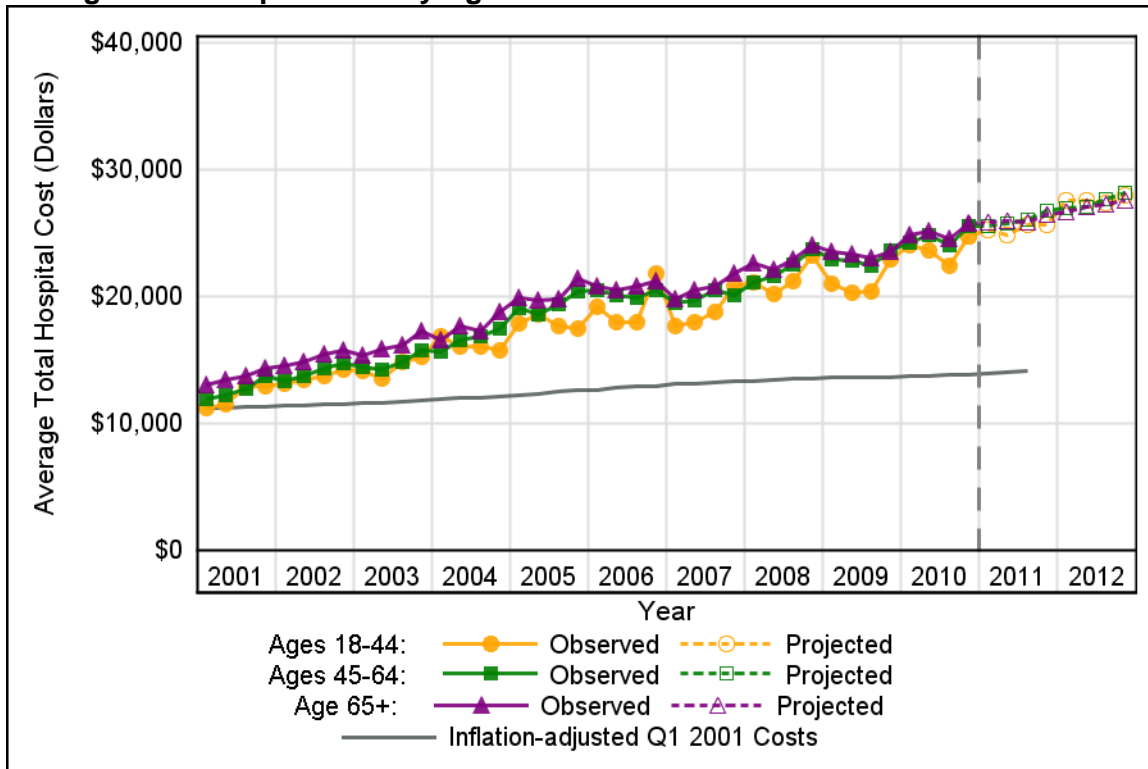
- The average hospital cost for discharges with PTCA without stents increased over time, from about \$13,000 in 2001 to \$25,000 in 2010. This increasing trend is projected to continue in 2011 and 2012, with the average hospital cost projected to be about \$28,000 at the end of 2012.
- The average hospital cost was similar for all three age groups, increasing from about \$13,000 in 2001 to \$24,500 in 2010.
- The average hospital cost was similar for males and females, increasing from about \$13,000 in 2001 to \$24,500 in 2010.
- Using the Gross Domestic Product (GDP) price index, a cost of \$13,000 in 2001 would be equivalent to a cost of \$16,000 in 2010. By 2010, the average hospital cost exceeded the cost expected by inflation alone.

Average Total Hospital Cost for All Adults

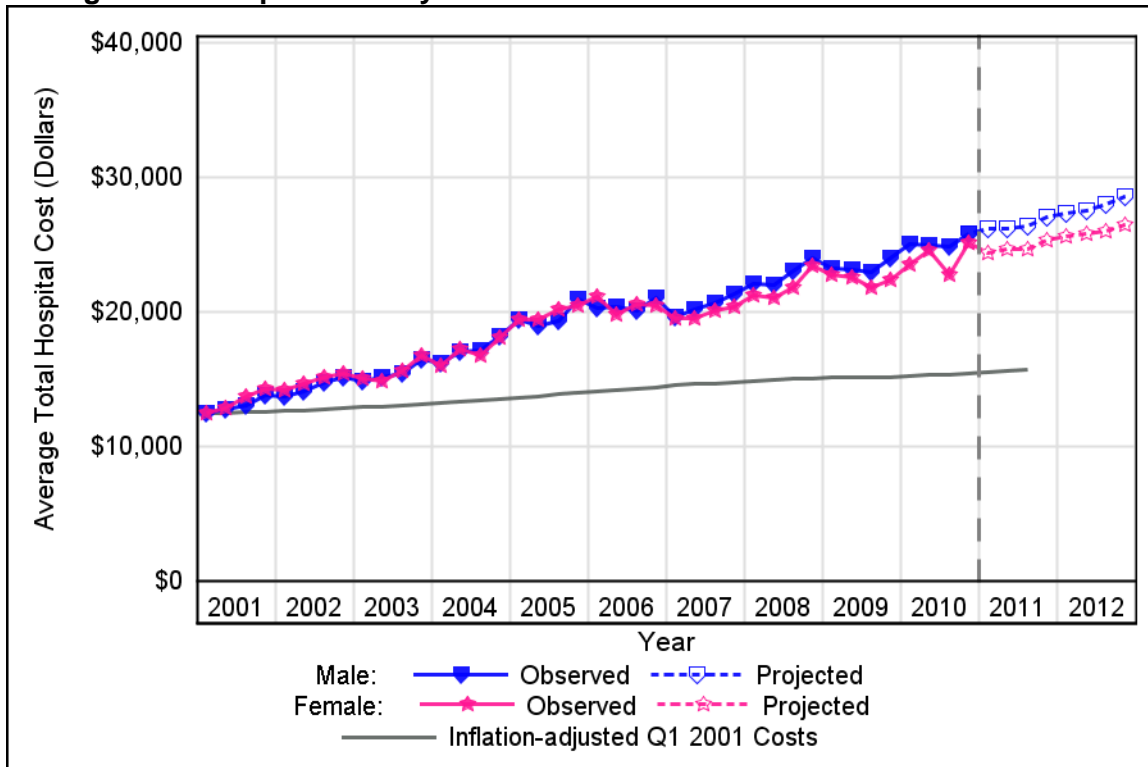


Inflation-adjusted Q1 2001 Costs: Cost per admission in the first quarter of 2001, adjusted for economy-wide inflation.
Source: Agency for Healthcare Research and Quality, Center for Delivery, Organization, and Markets, Healthcare Cost and Utilization Project, State Inpatient Databases.

Average Total Hospital Cost by Age



Average Total Hospital Cost by Gender



Inflation-adjusted Q1 2001 Costs: Cost per admission in the first quarter of 2001, adjusted for economy-wide inflation. Source: Agency for Healthcare Research and Quality, Center for Delivery, Organization, and Markets, Healthcare Cost and Utilization Project, State Inpatient Databases.

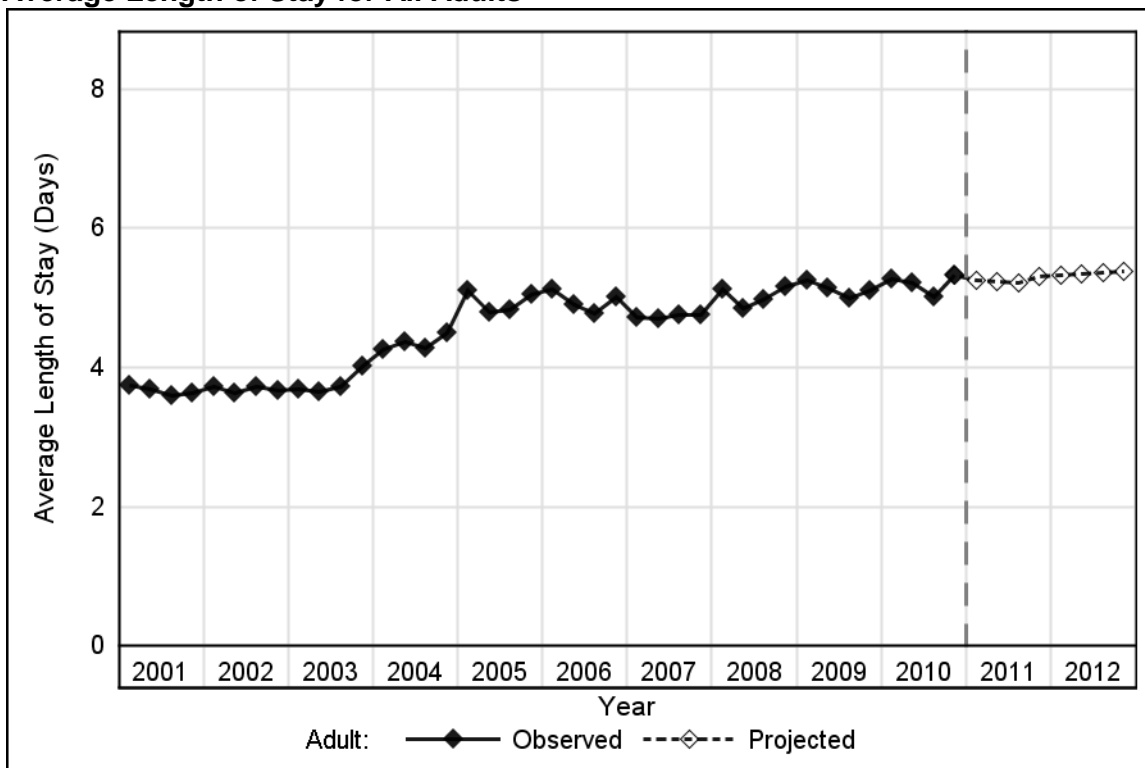
Percutaneous Transluminal Coronary Angioplasty without Stents

Average Length of Stay

Key Findings:

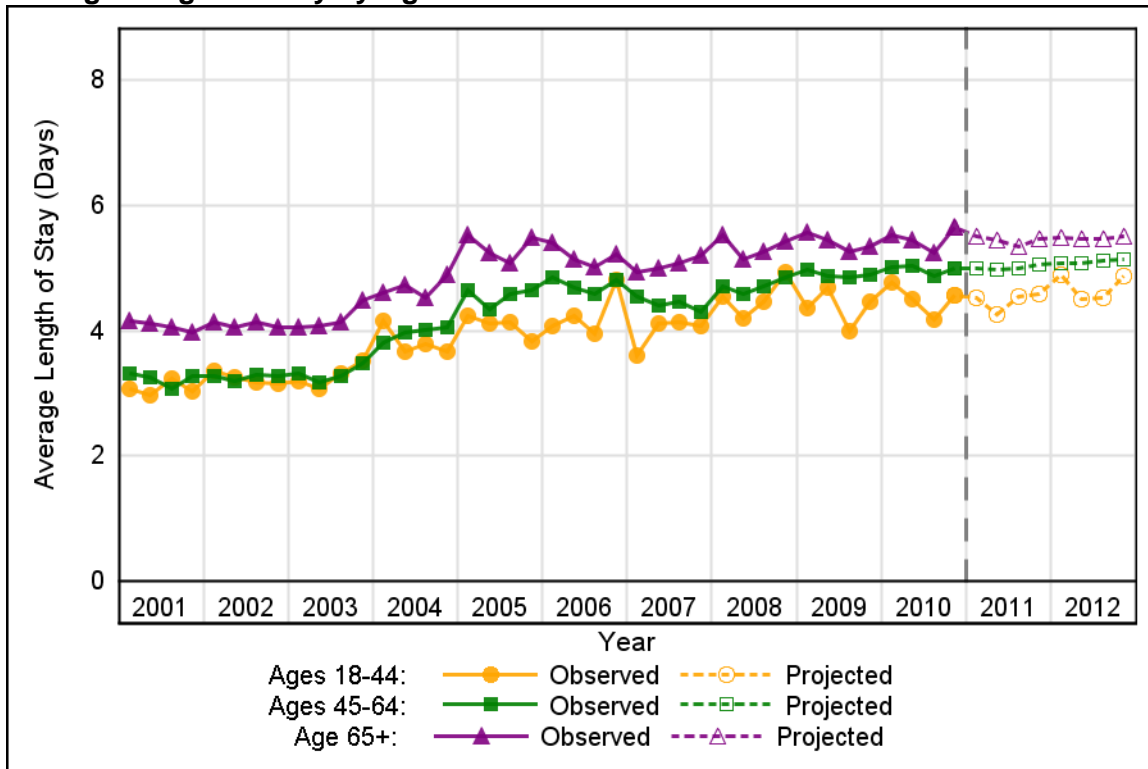
- The length of stay for discharges with PTCA without stents increased over time, from 3.7 days in 2001 to 5.2 days in 2010. This increasing trend is projected to continue in 2011 and 2012, with length of stay projected to be 5.4 days in 2012.
- Adults age 65 and older had the longest length of stay, at 4.1 days in 2001 and increasing to 5.5 days in 2010. The two youngest age groups had similar lengths of stay, at around 3.2 days in 2001 and increasing to 4.8 days in 2010.
- Length of stay was 0.5 days longer for females than for males. Females had a length of stay that increased from 4.1 days in 2001 to 5.4 days in 2010. Males had a length of stay that increased from 3.4 days in 2001 to 5.1 days in 2010.

Average Length of Stay for All Adults

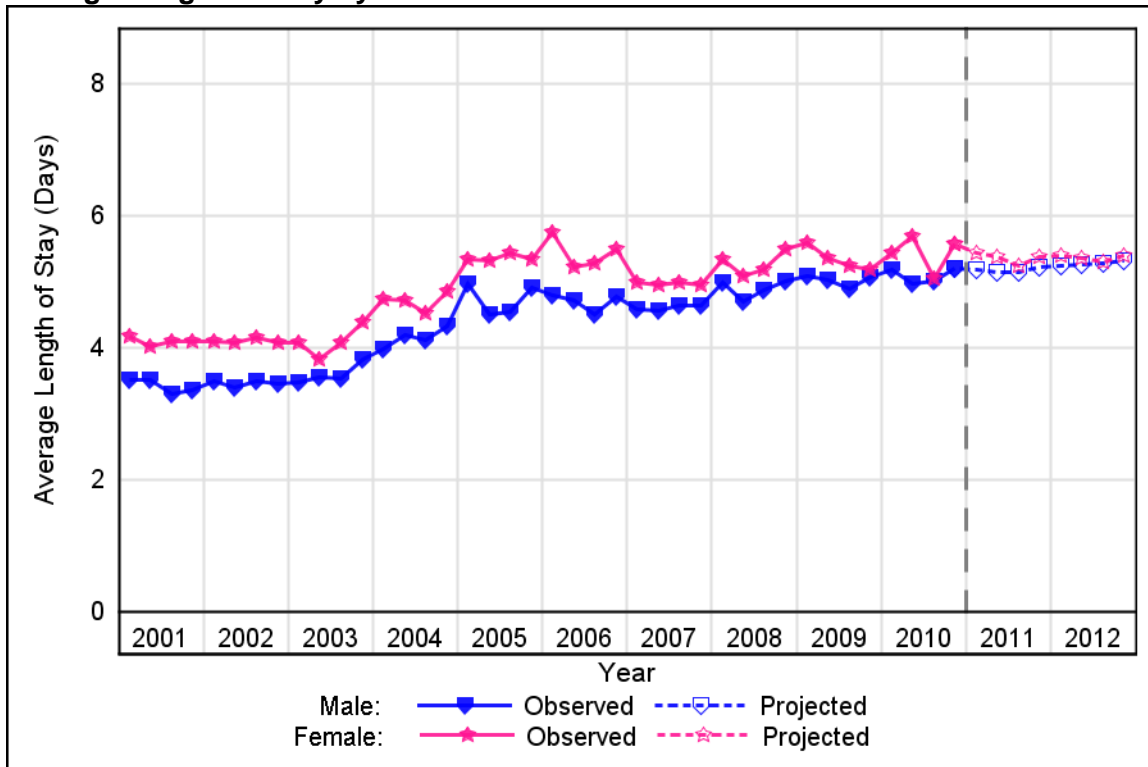


Source: Agency for Healthcare Research and Quality, Center for Delivery, Organization, and Markets, Healthcare Cost and Utilization Project, State Inpatient Databases.

Average Length of Stay by Age



Average Length of Stay by Gender



Source: Agency for Healthcare Research and Quality, Center for Delivery, Organization, and Markets, Healthcare Cost and Utilization Project, State Inpatient Databases.

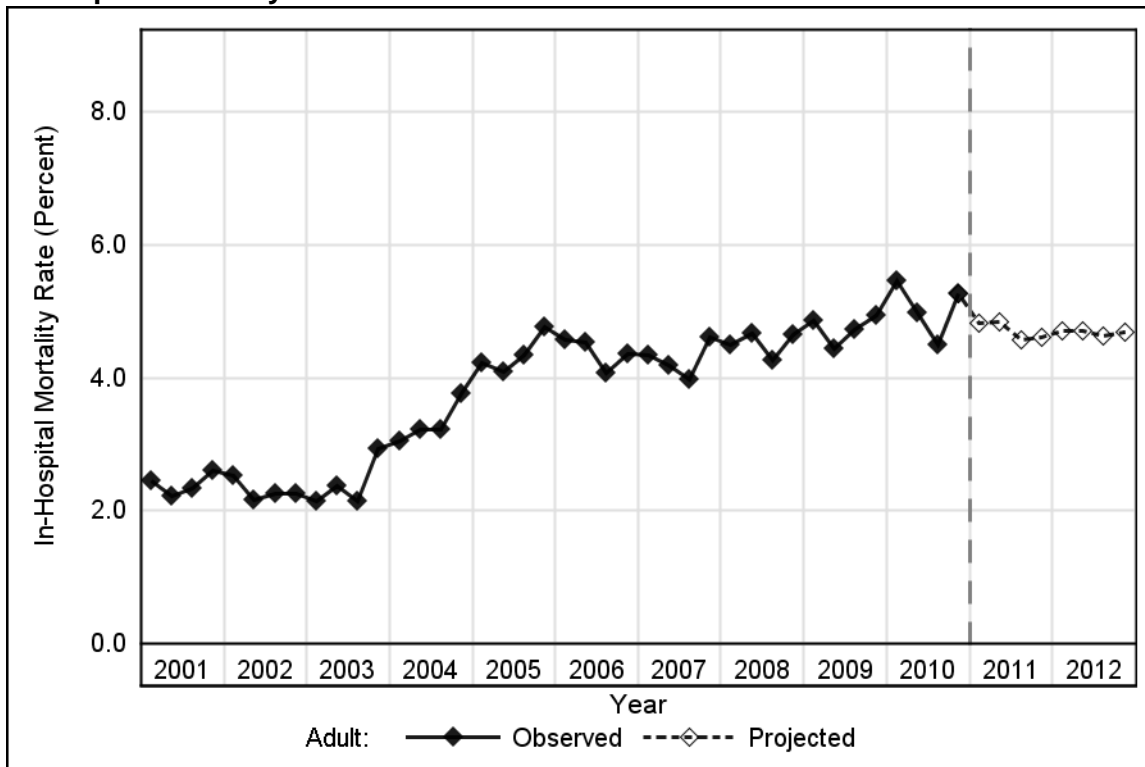
Percutaneous Transluminal Coronary Angioplasty without Stents

In-Hospital Mortality Rate

Key Findings:

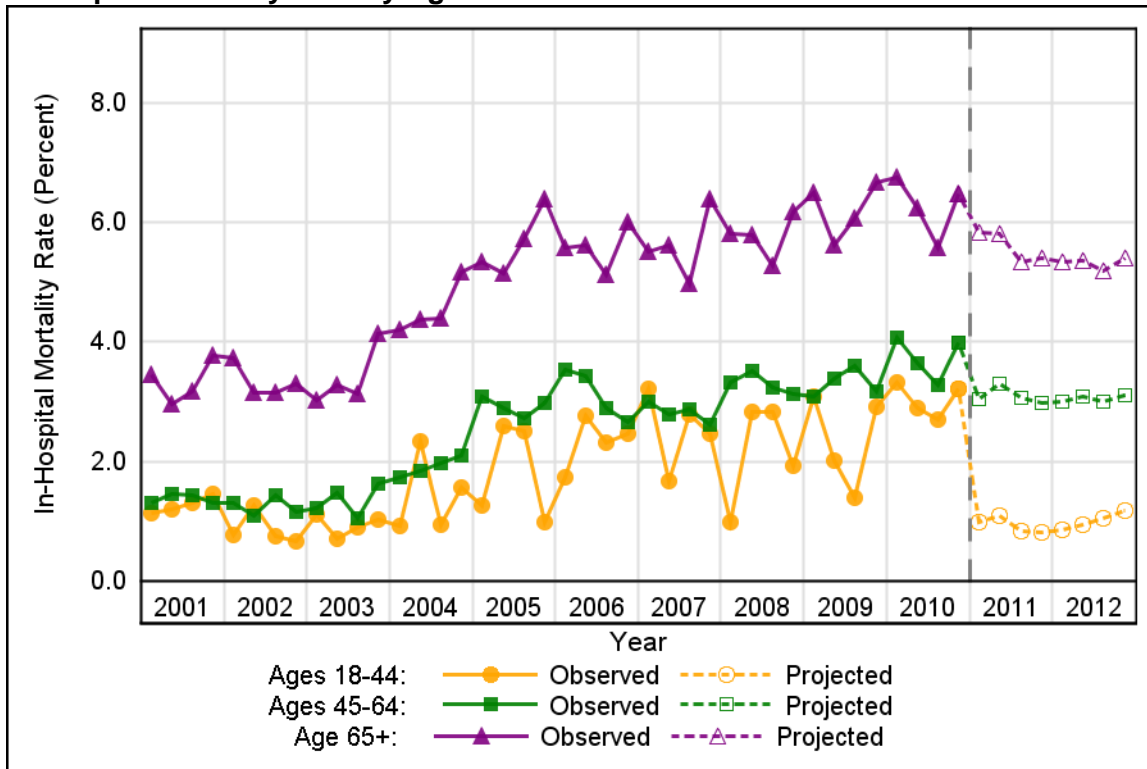
- The mortality rate for discharges with PTCA without stents increased over time, from 2.4 percent in 2001 to 5.1 percent in 2010. The mortality rate is projected to remain relatively stable in 2011 and 2012 at 4.7 percent.
- Adults age 65 and older had the highest mortality rate, at 3.4 percent in 2001 and increasing to 6.3 percent in 2010. Adults ages 45 to 64 had the next highest mortality rate, at 1.4 percent in 2001 and increasing to 3.8 percent in 2010. The mortality rate for adults ages 18 to 44 was erratic due to the small number of discharges among this age group (about 1,000 per quarter).
- The mortality rate was 1.1 percentage point higher for females than for males. Females had a mortality rate that increased from 3.0 percent in 2001 to 5.7 percent in 2010. Males had a mortality rate that increased from 2.1 percent in 2001 to 4.7 percent in 2010.

In-Hospital Mortality Rate for All Adults

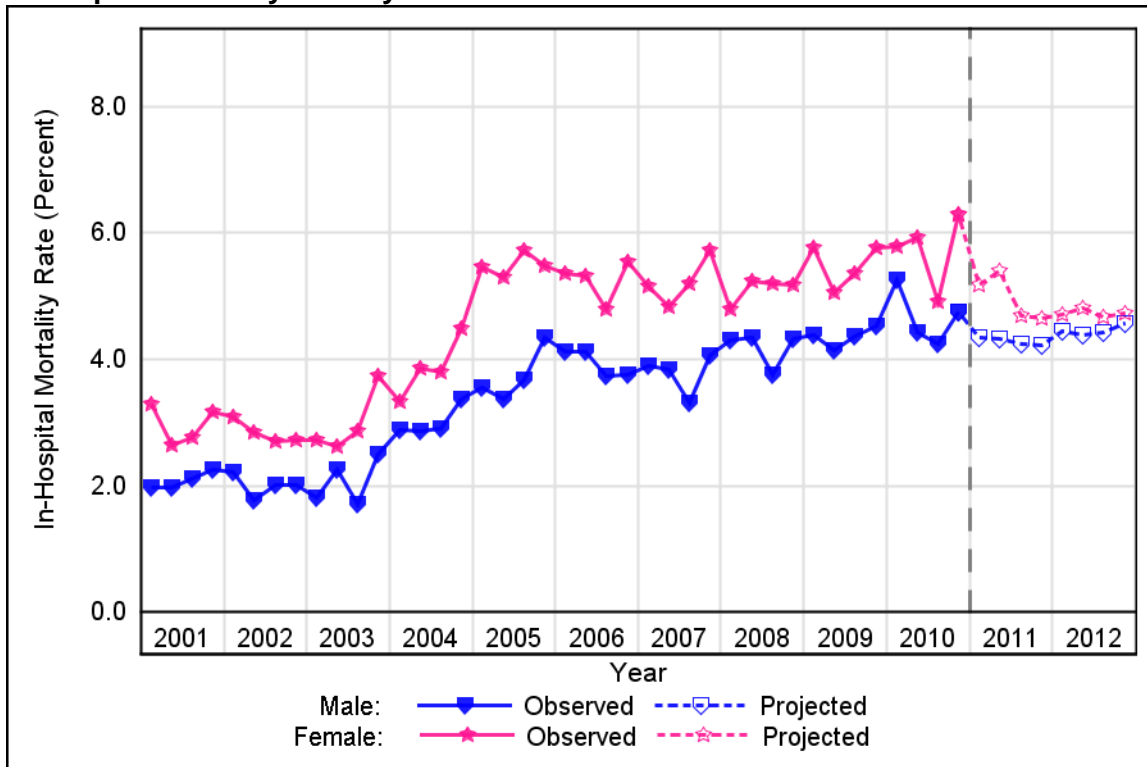


Source: Agency for Healthcare Research and Quality, Center for Delivery, Organization, and Markets, Healthcare Cost and Utilization Project, State Inpatient Databases.

In-Hospital Mortality Rate by Age



In-Hospital Mortality Rate by Gender



Source: Agency for Healthcare Research and Quality, Center for Delivery, Organization, and Markets, Healthcare Cost and Utilization Project, State Inpatient Databases.

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Percutaneous Transluminal Coronary Angioplasty with Stents

Percutaneous transluminal coronary angioplasty (PTCA) is used to treat narrowed coronary arteries. This procedure threads special tubing with an attached deflated balloon into the coronary arteries and then inflates the balloon to help clear the blocked areas. This procedure is combined with implantation of a stent (a wire mesh tube) to help keep the artery open and decrease the chance of another blockage. This procedure can include insertion of either a drug-eluting or a non-drug-eluting coronary artery stent. Using the HCUP SID from 2001 to 2010 and early 2011 data from 10 States, different outcomes for inpatient discharges with PTCA with stents are projected for 2011 to 2012.

Projections include the following:

- Total inpatient discharges for all adults, adults by age group, and adults by gender. Discharge counts exclude inpatient stays that were transferred out to another acute care hospital. This ensures that these events are not double counted.
- Average total hospital cost for all adults, adults by age group, and adults by gender. Average total hospital cost reflects actual expenses incurred in the production of hospital services; physician costs are not included. For comparison, a line is included that depicts the change in the average inpatient hospital cost per admission in the first quarter of 2001 (Q1 2001) due solely to economy-wide inflation. The difference between the actual/projected cost line and the inflation-adjusted Q1 2001 cost line represents cost increases due to other non-inflation factors, such as new technology, patient case mix, etc.
- Average length of stay for all adults, adults by age group, and adults by gender. In HCUP, the length of stay counts nights spent in the hospital. If a patient is admitted and discharged on the same day, the length of stay is zero.
- In-hospital mortality rate for all adults, adults by age group, and adults by gender.

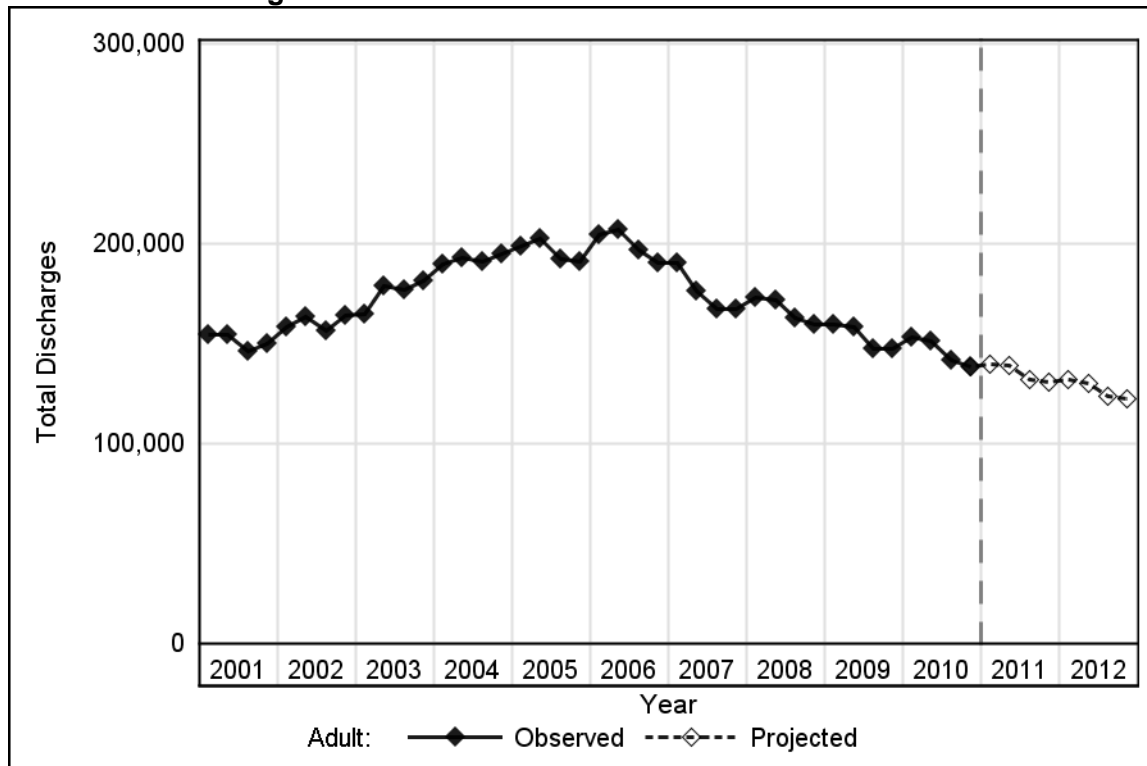
Percutaneous Transluminal Coronary Angioplasty with Stents

Number of Discharges

Key Findings:

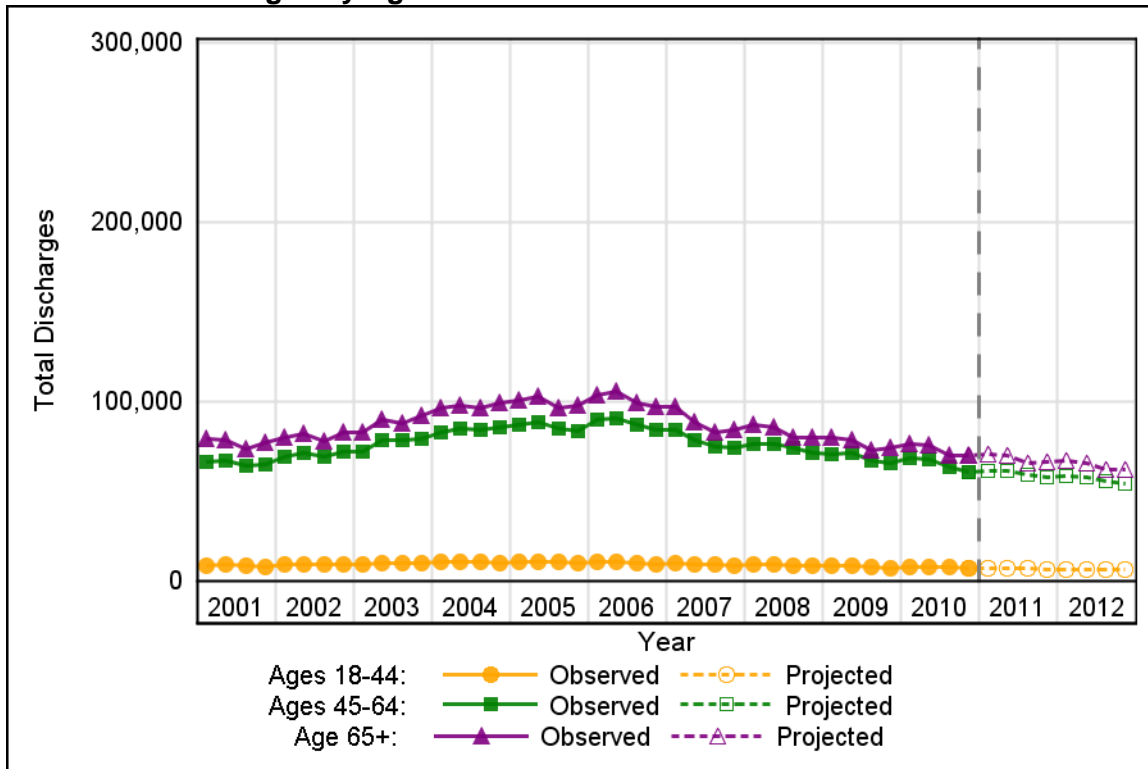
- The number of discharges for PTCA with stents increased from about 151,500 discharges per quarter in 2001 to 200,000 discharges per quarter in 2006, and then decreased to 146,000 discharges per quarter in 2010. This decreasing trend is projected to continue in 2011 and 2012, with quarterly discharges projected to be about 123,000 at the end of 2012.
- For adults age 65 and older, quarterly discharges increased from about 77,000 in 2001 to 101,500 in 2006 and then decreased to 73,000 in 2010. For adults ages 45 to 64, quarterly discharges increased from about 65,500 in 2001 to 88,000 in 2006 and then decreased to 65,500 in 2010. For adults ages 18 to 44, quarterly discharges increased from about 8,500 in 2001 to 10,500 in 2006 and then decreased to 7,500 in 2010.
- Males had about 55,500 more discharges per quarter than did females. For males, quarterly discharges increased from about 100,000 in 2001 to 132,000 in 2006 and then decreased to 97,000 in 2010. For females, quarterly discharges increased from about 51,500 in 2001 to 67,500 in 2006 and then decreased to 49,000 in 2010.

Number of Discharges for All Adults

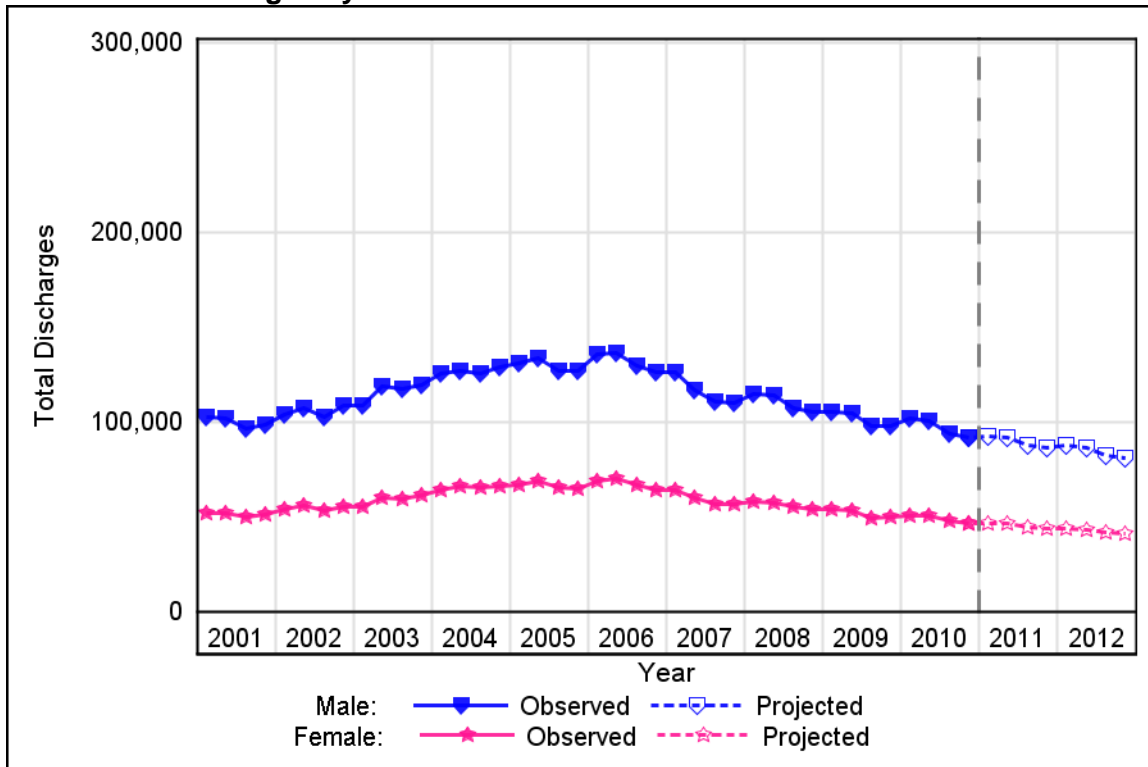


Source: Agency for Healthcare Research and Quality, Center for Delivery, Organization, and Markets, Healthcare Cost and Utilization Project, State Inpatient Databases.

Number of Discharges by Age



Number of Discharges by Gender



Source: Agency for Healthcare Research and Quality, Center for Delivery, Organization, and Markets, Healthcare Cost and Utilization Project, State Inpatient Databases.

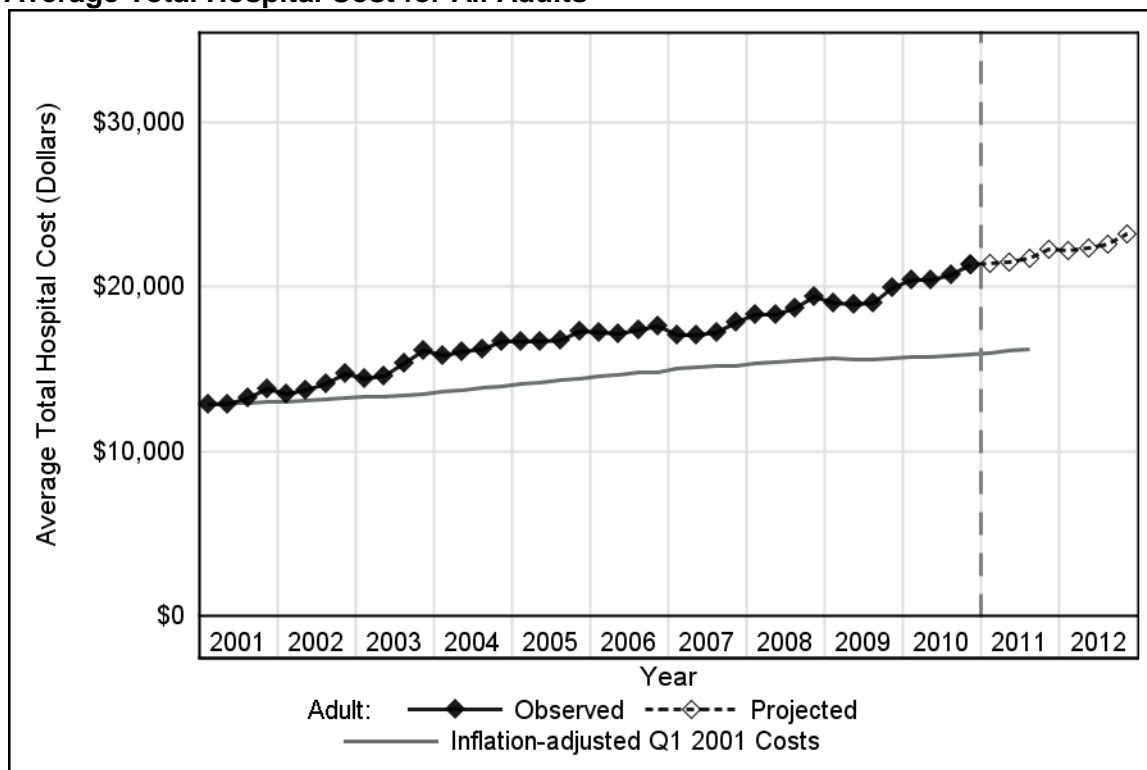
Percutaneous Transluminal Coronary Angioplasty with Stents

Average Total Hospital Cost

Key Findings:

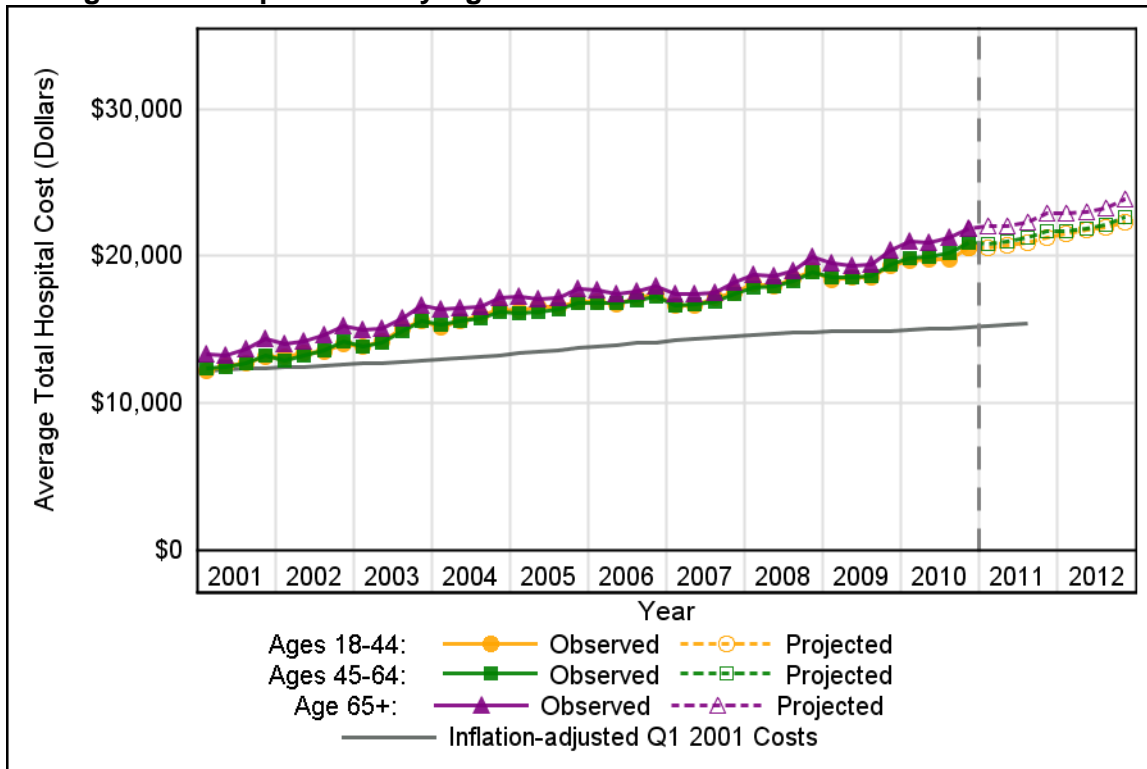
- The average hospital cost for discharges with PTCA with stents increased over time, from about \$13,000 in 2001 to \$20,500 in 2010. This increasing trend is projected to continue in 2011 and 2012, with the average hospital cost projected to be about \$23,000 at the end of 2012.
- The average hospital cost was similar for all three age groups, increasing from about \$13,000 in 2001 to \$20,500 in 2010.
- The average hospital cost was similar for males and females, increasing from about \$13,500 in 2001 to \$21,000 in 2010.
- Using the Gross Domestic Product (GDP) price index, a cost of \$13,000 in 2001 would be equivalent to a cost of \$16,000 in 2010. By 2010, the average hospital cost exceeded the cost expected by inflation alone.

Average Total Hospital Cost for All Adults

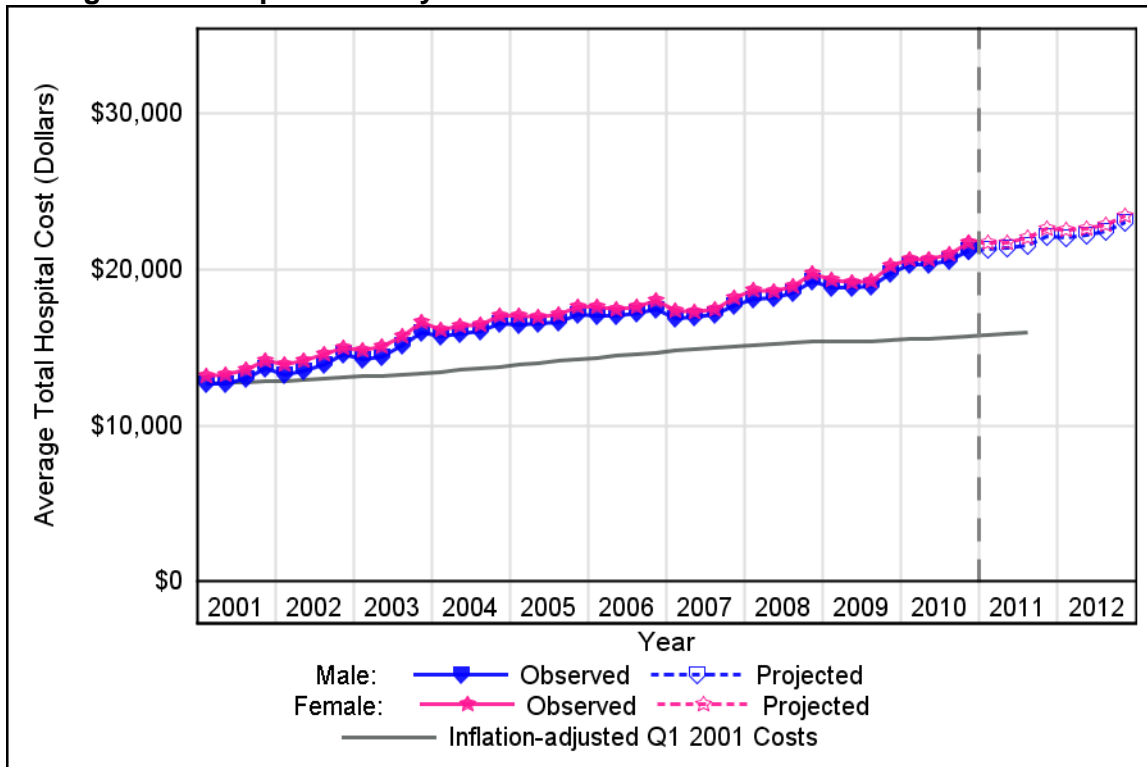


Inflation-adjusted Q1 2001 Costs: Cost per admission in the first quarter of 2001, adjusted for economy-wide inflation.
Source: Agency for Healthcare Research and Quality, Center for Delivery, Organization, and Markets, Healthcare Cost and Utilization Project, State Inpatient Databases.

Average Total Hospital Cost by Age



Average Total Hospital Cost by Gender



Inflation-adjusted Q1 2001 Costs: Cost per admission in the first quarter of 2001, adjusted for economy-wide inflation. Source: Agency for Healthcare Research and Quality, Center for Delivery, Organization, and Markets, Healthcare Cost and Utilization Project, State Inpatient Databases.

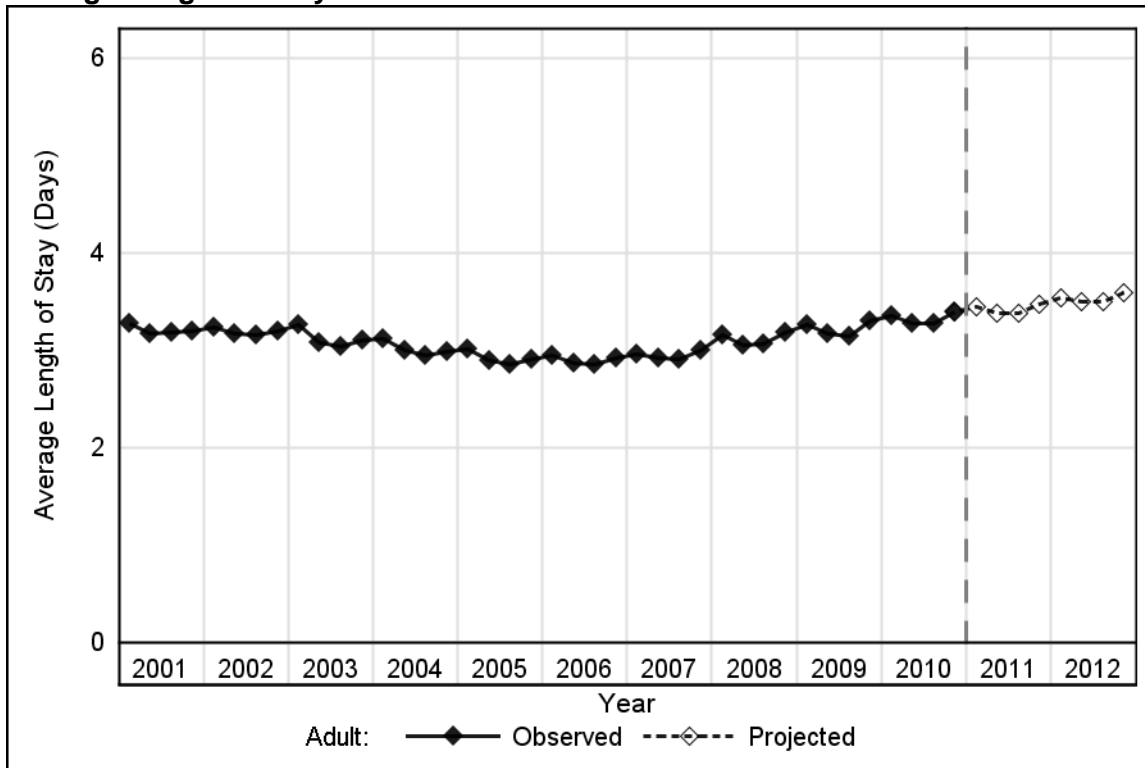
Percutaneous Transluminal Coronary Angioplasty with Stents

Average Length of Stay

Key Findings:

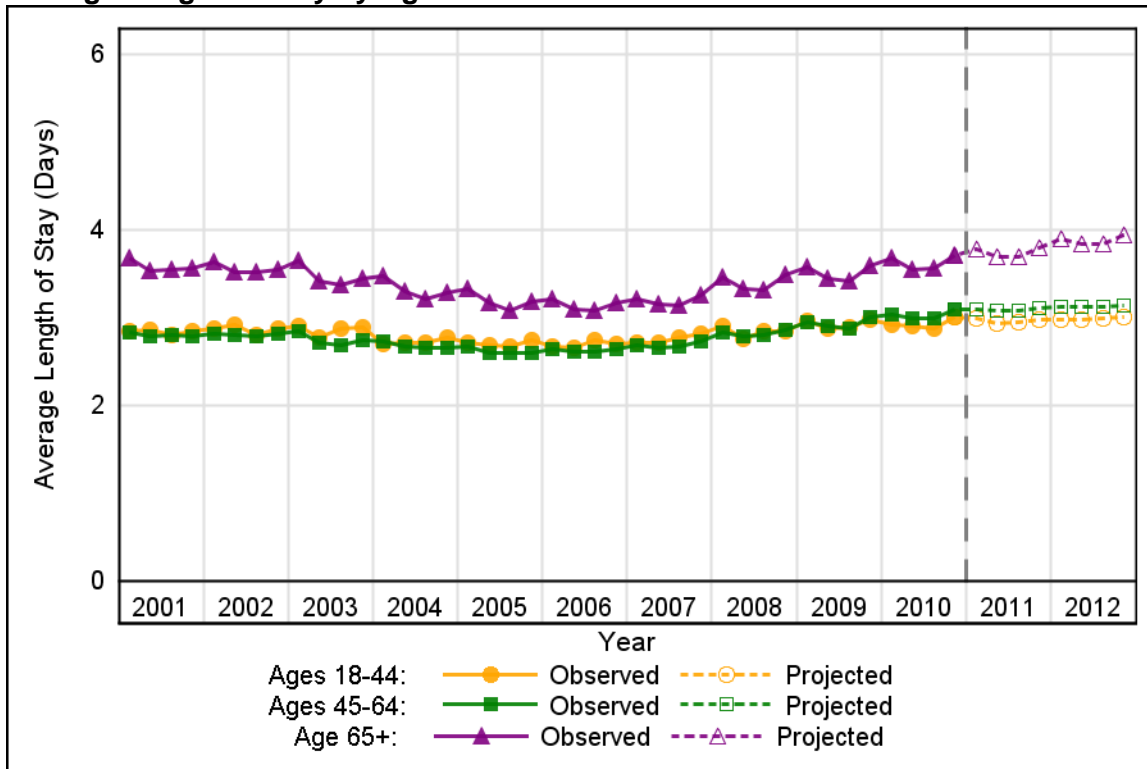
- The length of stay for discharges with PTCA with stents decreased from 3.2 days in 2001 to 2.9 days in 2006 and then increased to 3.4 days in 2010. Length of stay is projected to remain at about this same level in 2011 and 2012.
- For adults age 65 and older, length of stay decreased from 3.6 days in 2001 to 3.2 days in 2006 and then increased to 3.7 days in 2010. Length of stay was similar and relatively stable over time for the two younger age groups at about 2.8 days.
- Length of stay was 0.6 days longer for females than for males. Females had a length of stay of 3.7 days in 2001, decreasing to 3.3 days in 2006, and then increasing to 3.7 days in 2010. Males had a relatively stable length of stay over time at 2.9 days.

Average Length of Stay for All Adults

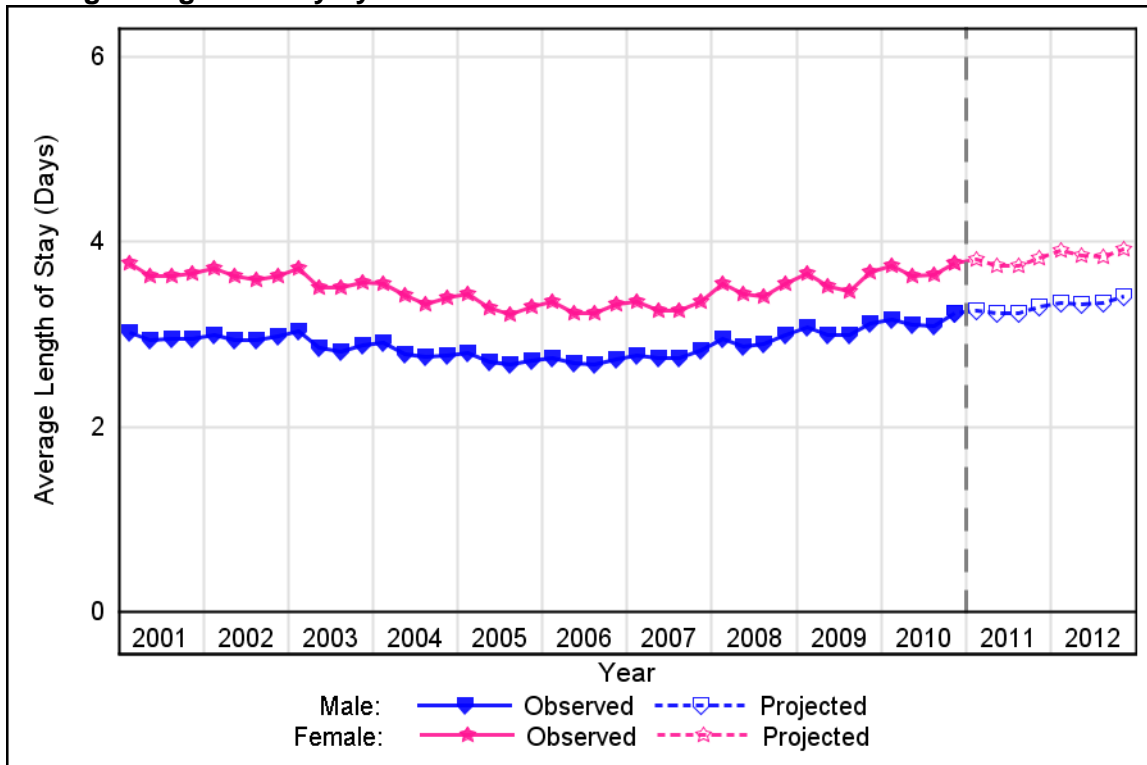


Source: Agency for Healthcare Research and Quality, Center for Delivery, Organization, and Markets, Healthcare Cost and Utilization Project, State Inpatient Databases.

Average Length of Stay by Age



Average Length of Stay by Gender



Source: Agency for Healthcare Research and Quality, Center for Delivery, Organization, and Markets, Healthcare Cost and Utilization Project, State Inpatient Databases.

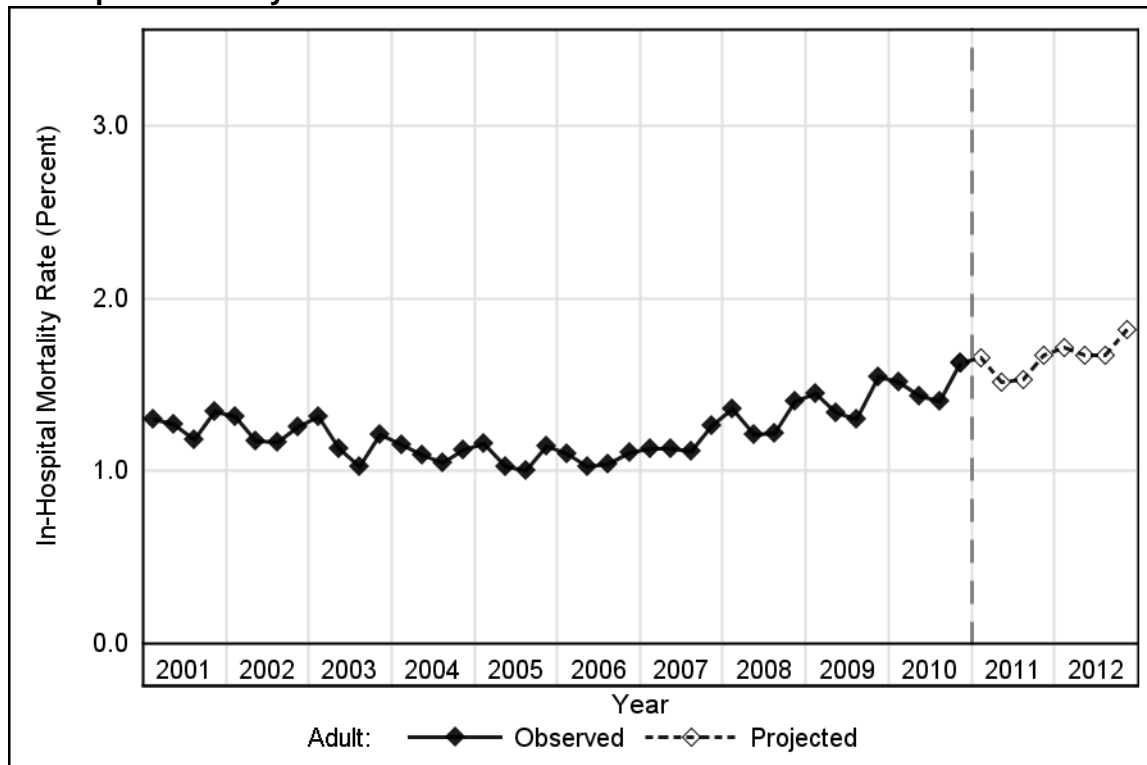
Percutaneous Transluminal Coronary Angioplasty with Stents

In-Hospital Mortality Rate

Key Findings:

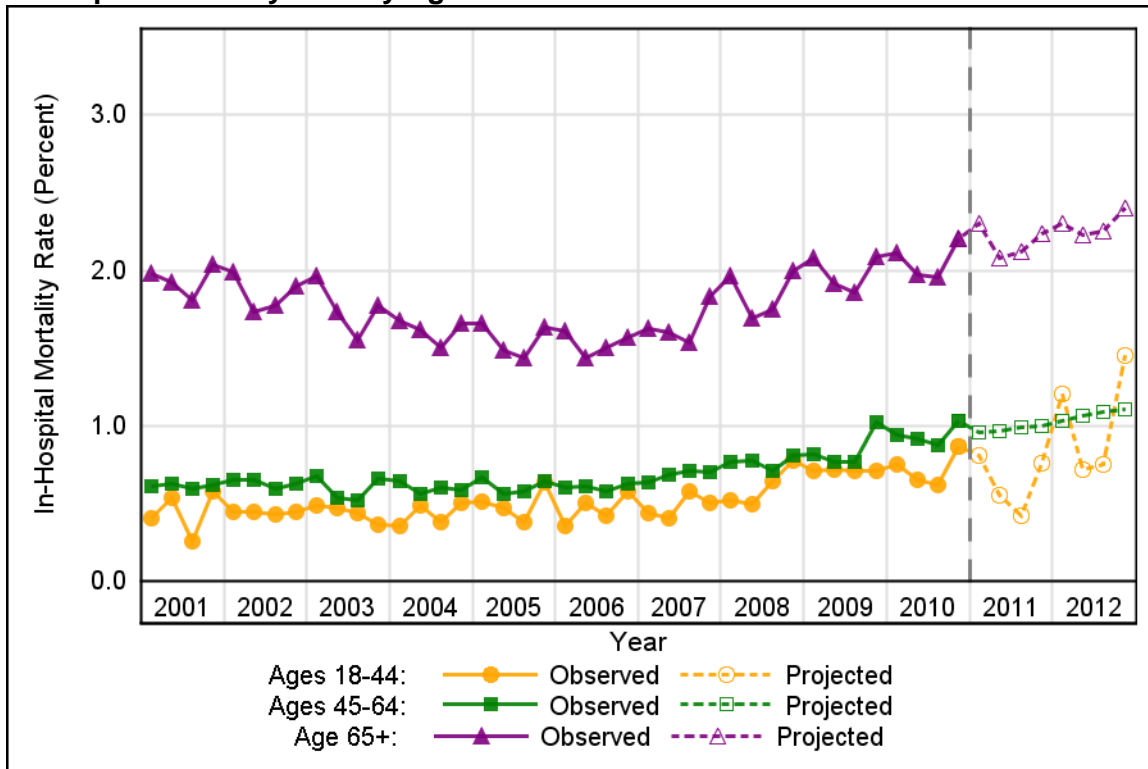
- The mortality rate for discharges with PTCA with stents decreased from 1.3 percent in 2001 to 1.1 percent in 2006, and then increased to 1.5 percent in 2010. This increasing trend is projected to continue in 2011 and 2012, with the mortality rate projected to be 1.7 percent in 2012.
- The mortality rate varied over time for the three age groups. For adults age 65 and older, the mortality rate decreased from 1.9 percent in 2001 to 1.5 percent in 2006 and then increased to 2.1 percent in 2010. For adults ages 45 to 64, the mortality rate increased from 0.6 percent in 2001 to 0.9 percent in 2010. For adults ages 18 to 44, the mortality rate increased from 0.4 percent in 2001 to 0.7 percent in 2010.
- The mortality rate was 0.6 percentage points higher for females than for males. For females, the mortality rate decreased from 1.7 percent in 2001 to 1.4 percent in 2006 and then increased to 1.9 percent in 2010. For males, the mortality rate decreased from 1.0 percent in 2001 to 0.9 percent in 2006 and then increased to 1.3 percent in 2010.

In-Hospital Mortality Rate for All Adults

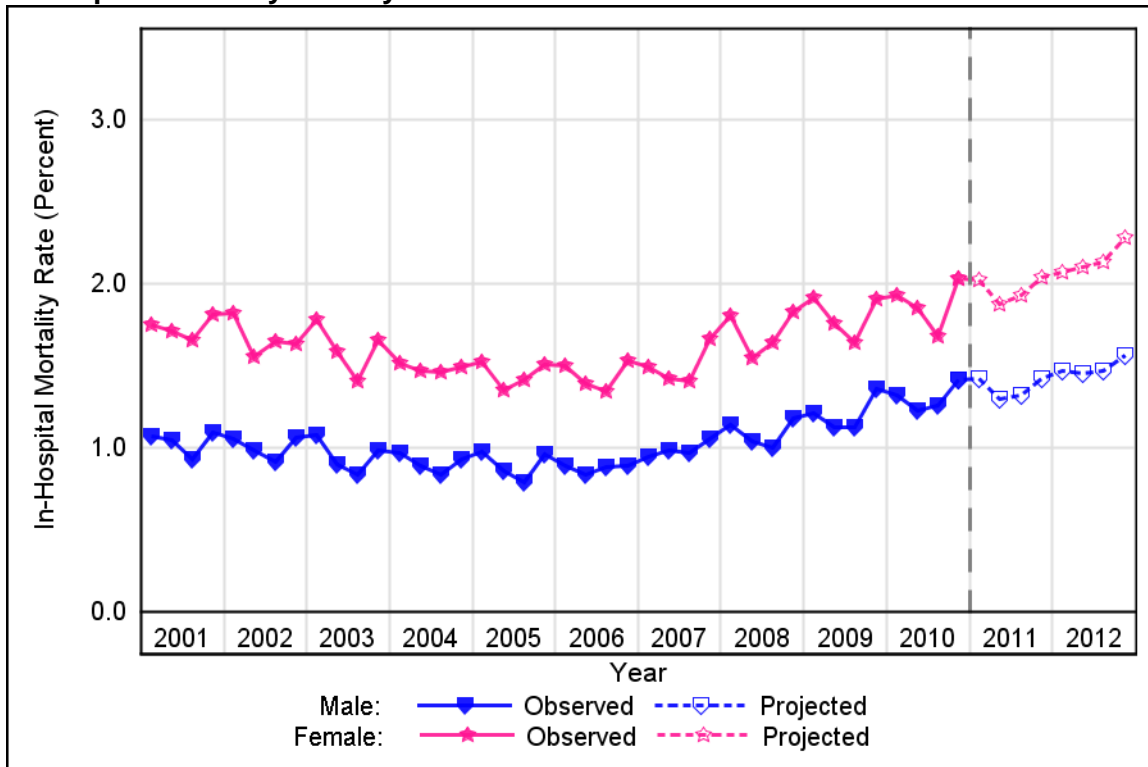


Source: Agency for Healthcare Research and Quality, Center for Delivery, Organization, and Markets, Healthcare Cost and Utilization Project, State Inpatient Databases.

In-Hospital Mortality Rate by Age



In-Hospital Mortality Rate by Gender



Source: Agency for Healthcare Research and Quality, Center for Delivery, Organization, and Markets, Healthcare Cost and Utilization Project, State Inpatient Databases.

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Aortic Resection

Aortic resection is used to repair an aortic dissection involving a tear in the inner wall of the aorta. The aorta is the largest artery in the human body, traveling from the heart through the chest and abdomen to deliver oxygen-rich blood throughout the body. Using the HCUP SID from 2001 to 2010 and early 2011 data from 10 States, different outcomes for inpatient discharges with an aortic resection are projected for 2011 to 2012.

Projections include the following:

- Total inpatient discharges for all adults, adults by age group, and adults by gender. Discharge counts exclude inpatient stays that were transferred out to another acute care hospital. This ensures that these events are not double counted.
- Average total hospital cost for all adults, adults by age group, and adults by gender. Average total hospital cost reflects actual expenses incurred in the production of hospital services; physician costs are not included. For comparison, a line is included that depicts the change in the average inpatient hospital cost per admission in the first quarter of 2001 (Q1 2001) due solely to economy-wide inflation. The difference between the actual/projected cost line and the inflation-adjusted Q1 2001 cost line represents cost increases due to other non-inflation factors, such as new technology, patient case mix, etc.
- Average length of stay for all adults, adults by age group, and adults by gender. In HCUP, the length of stay counts nights spent in the hospital. If a patient is admitted and discharged on the same day, the length of stay is zero.
- In-hospital mortality rate for all adults, adults by age group, and adults by gender.

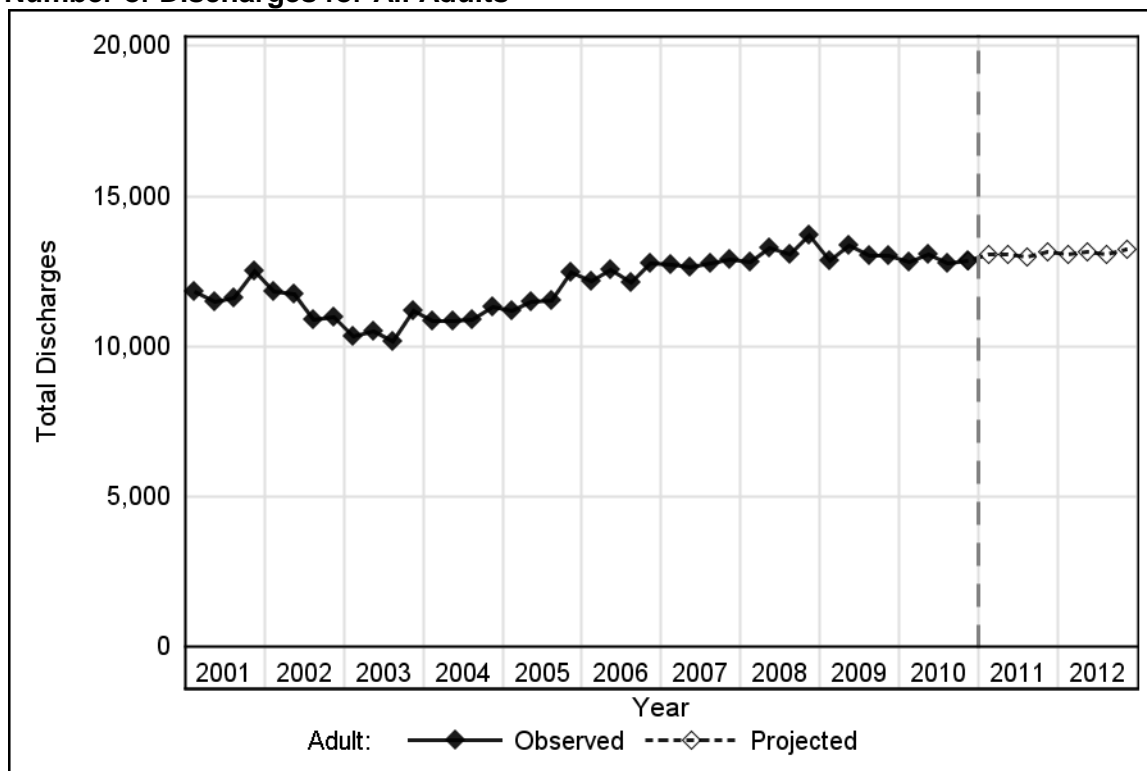
Aortic Resection

Number of Discharges

Key Findings:

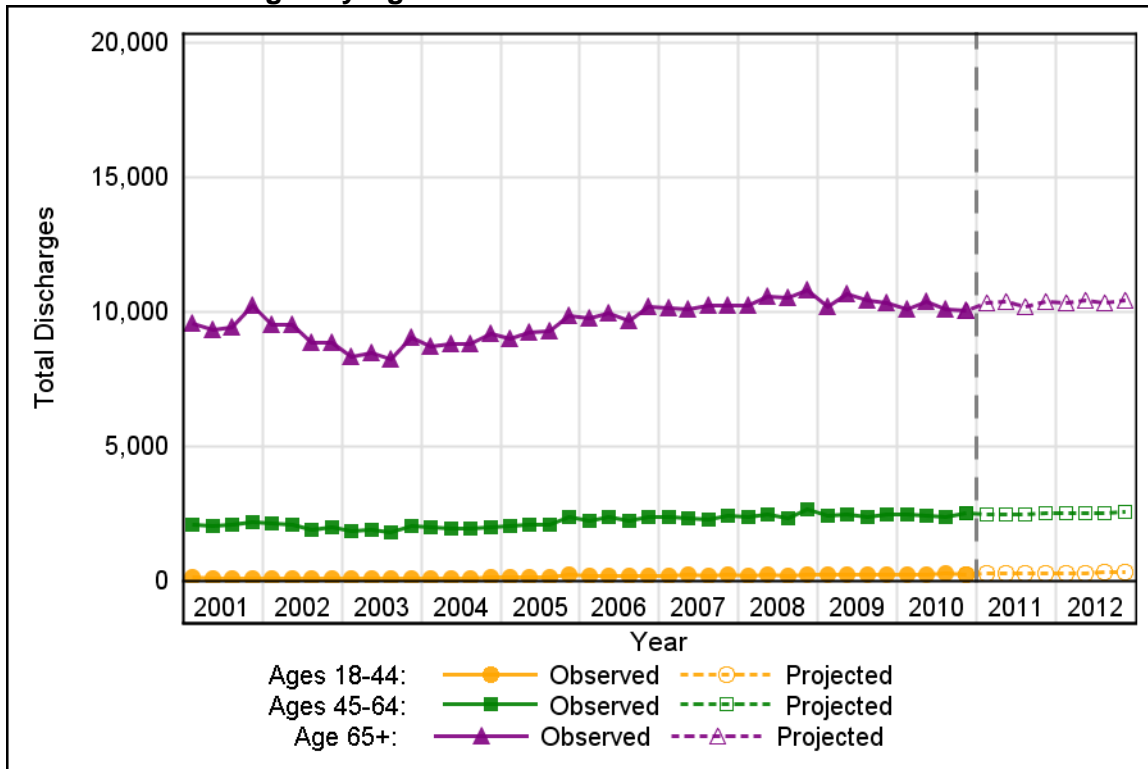
- The number of discharges for aortic resection decreased from about 12,000 discharges per quarter in 2001 to 10,500 discharges per quarter in 2003, and then increased to 13,000 discharges per quarter in 2008. Discharges remained relatively stable at about 13,000 discharges per quarter since 2008 and are projected to continue at about this same level in 2011 and 2012.
- Discharges varied over time for the three age groups. For adults age 65 and older, quarterly discharges decreased from about 9,500 in 2001 to 8,500 in 2003 and then increased to 10,500 in 2008, where it has remained. For adults ages 45 to 64, quarterly discharges were relatively stable at about 2,000 discharge per quarter between 2001 and 2003 and then increased to about 2,500 discharges per quarter in 2008, where it has remained. For adults ages 18 to 44, quarterly discharges increased from about 100 in 2001 to 250 in 2010.
- Males had about 6,500 more discharges per quarter than did females. For males, quarterly discharges decreased from about 9,500 in 2001 to 8,000 in 2003 and then increased to 10,000 in 2008, where it has remained. For females, discharges increased slightly from about 2,500 discharges per quarter in 2001 to 3,000 discharges per quarter in 2010.

Number of Discharges for All Adults

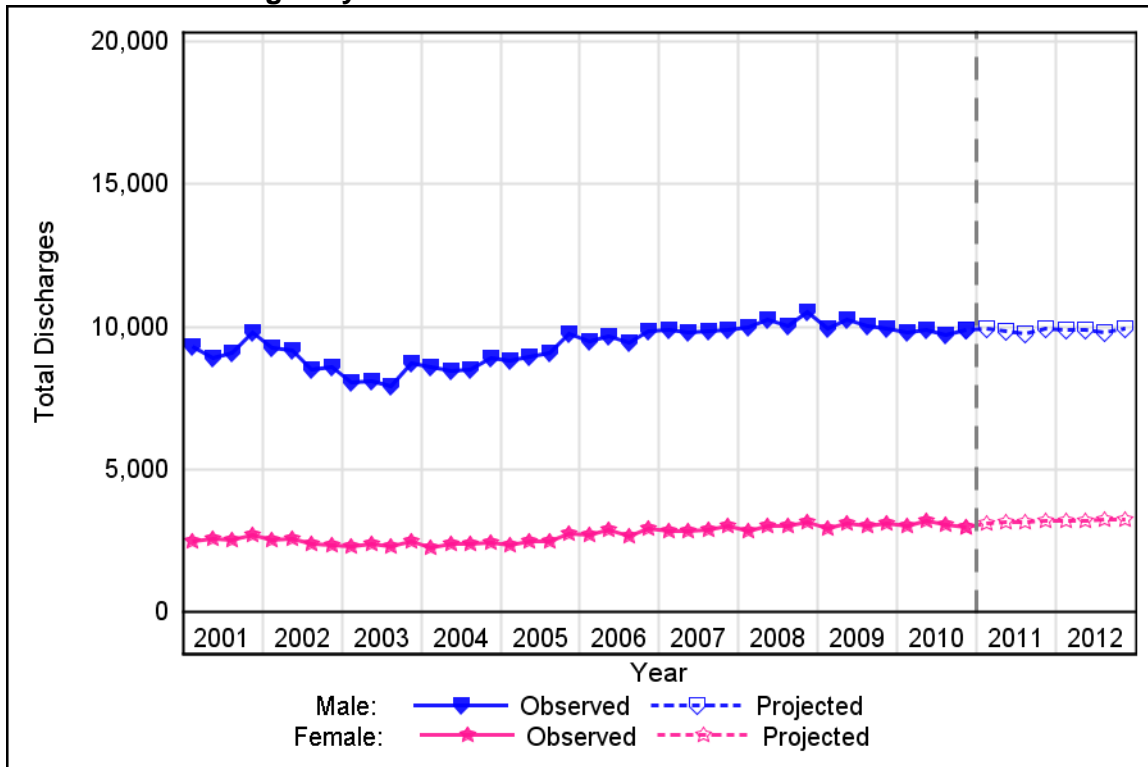


Source: Agency for Healthcare Research and Quality, Center for Delivery, Organization, and Markets, Healthcare Cost and Utilization Project, State Inpatient Databases.

Number of Discharges by Age



Number of Discharges by Gender



Source: Agency for Healthcare Research and Quality, Center for Delivery, Organization, and Markets, Healthcare Cost and Utilization Project, State Inpatient Databases.

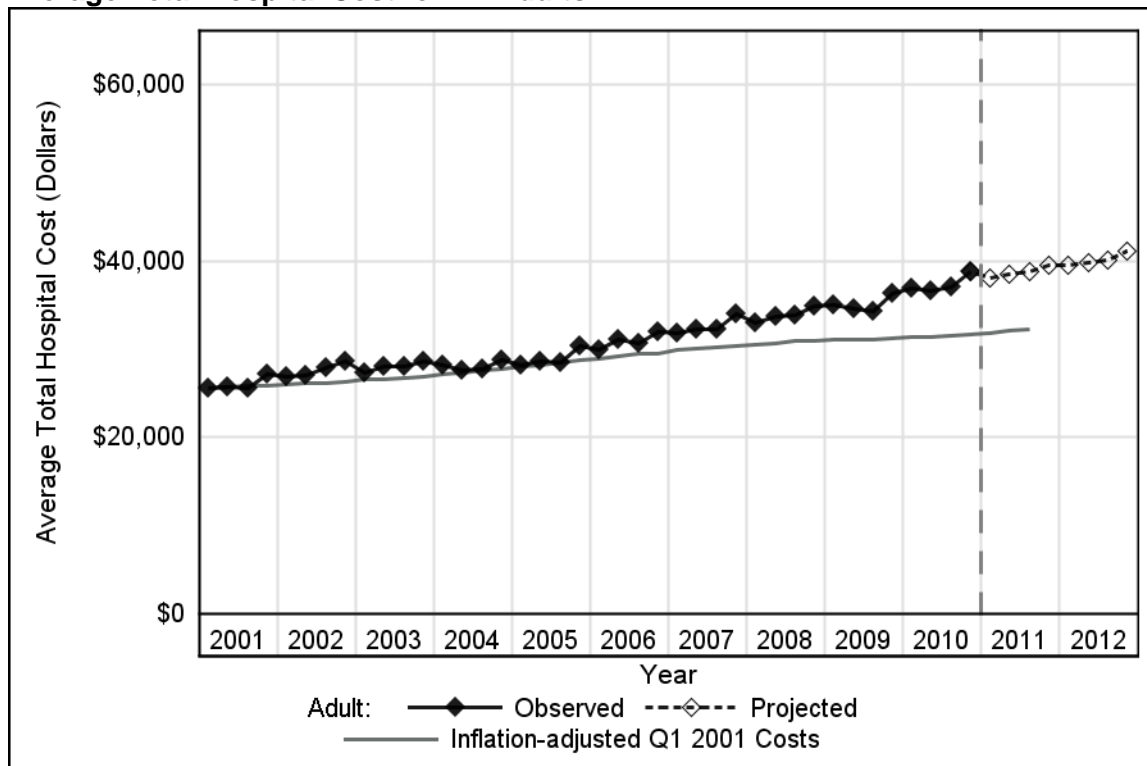
Aortic Resection

Average Total Hospital Cost

Key Findings:

- The average hospital cost for discharges with aortic resection increased over time, from about \$26,000 in 2001 to \$37,500 in 2010. This increasing trend is projected to continue in 2011 and 2012, with the average hospital cost projected to be about \$41,000 at the end of 2012.
- The average hospital cost was initially similar for the two older age groups, at about \$26,000 in 2001, but increased at a greater rate for adults ages 45 to 64 than for adults age 65 and older. For adults ages 45 to 64, the average hospital cost was \$41,500 in 2010. For adults age 65 and older, the average hospital cost was \$35,500 in 2010. The average hospital cost for adults ages 18 to 44 was not included due to the small number of discharges among this age group (about 175 per quarter).
- The average hospital cost was about \$4,000 higher for females than for males. Females had an average hospital cost that increased from about \$29,000 in 2001 to \$41,000 in 2010. Males had an average hospital cost that increased from about \$25,000 in 2001 to \$36,000 in 2010.
- Using the Gross Domestic Product (GDP) price index, a cost of \$26,000 in 2001 would be equivalent to a cost of \$32,500 in 2010. By 2010, the average hospital cost exceeded the cost expected by inflation alone.

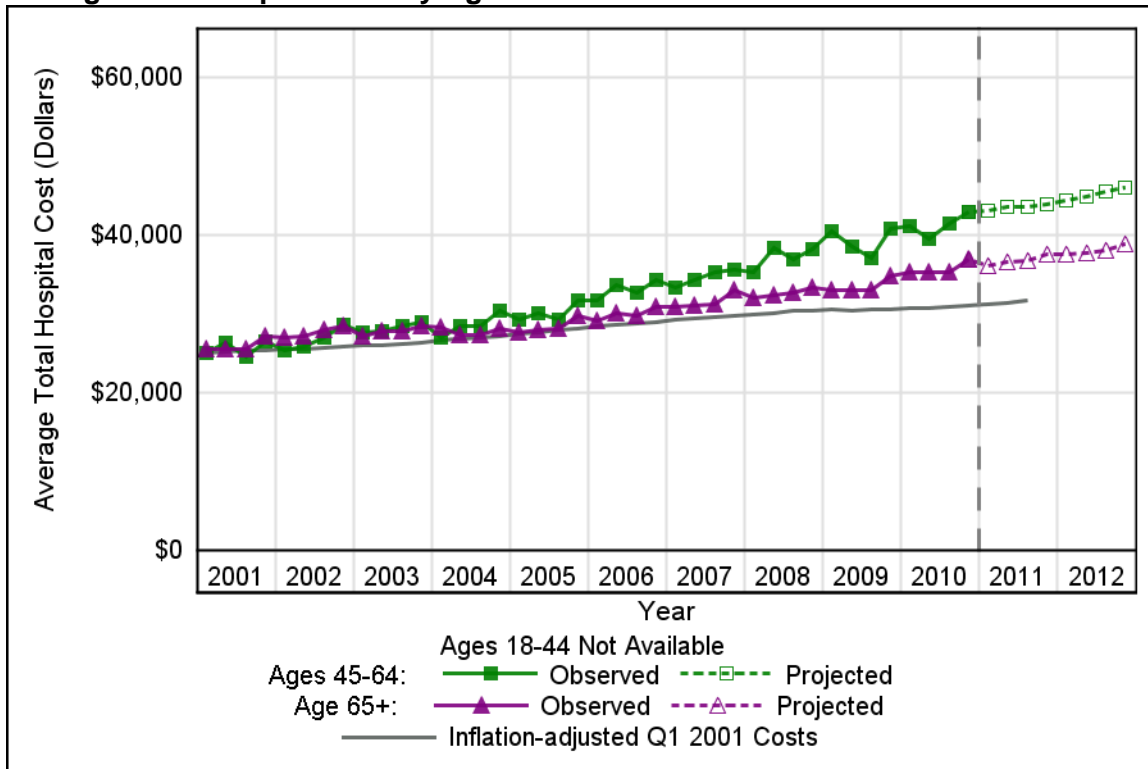
Average Total Hospital Cost for All Adults



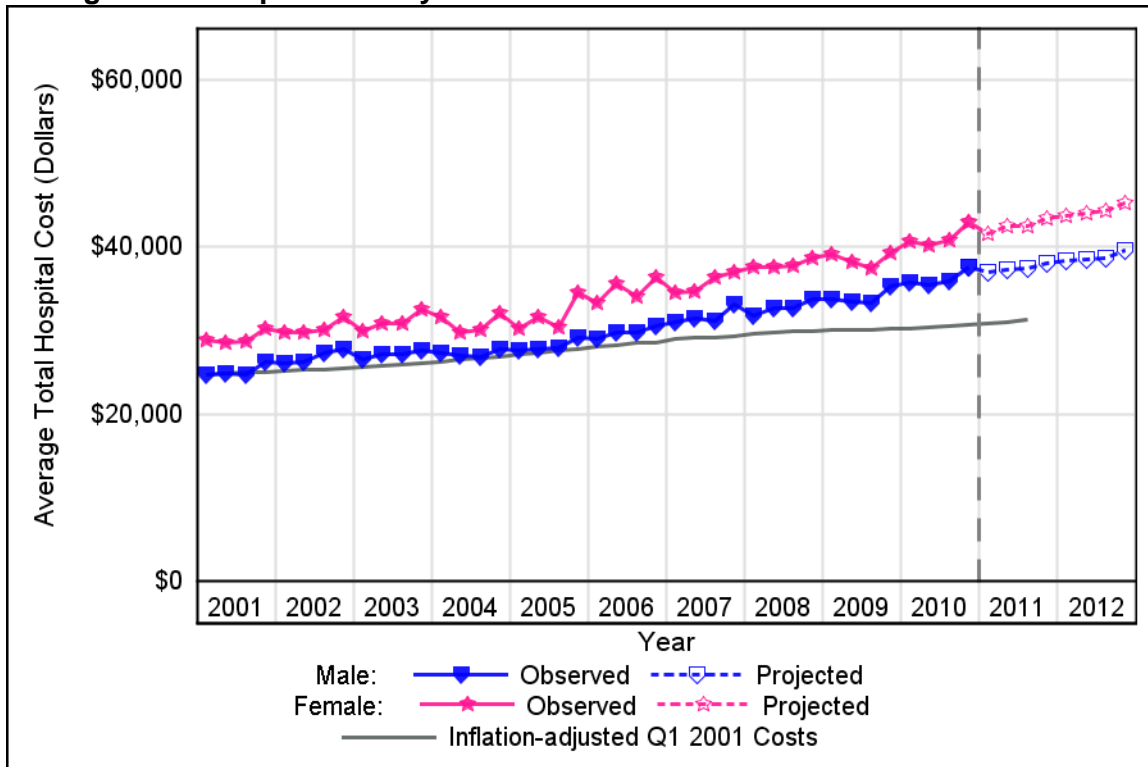
Inflation-adjusted Q1 2001 Costs: Cost per admission in the first quarter of 2001, adjusted for economy-wide inflation.
Source: Agency for Healthcare Research and Quality, Center for Delivery, Organization, and Markets, Healthcare Cost and Utilization Project, State Inpatient Databases.

**HCUP Projections:
Cardiovascular/Cerebrovascular Conditions and Procedures**

Average Total Hospital Cost by Age



Average Total Hospital Cost by Gender



Inflation-adjusted Q1 2001 Costs: Cost per admission in the first quarter of 2001, adjusted for economy-wide inflation. Source: Agency for Healthcare Research and Quality, Center for Delivery, Organization, and Markets, Healthcare Cost and Utilization Project, State Inpatient Databases.

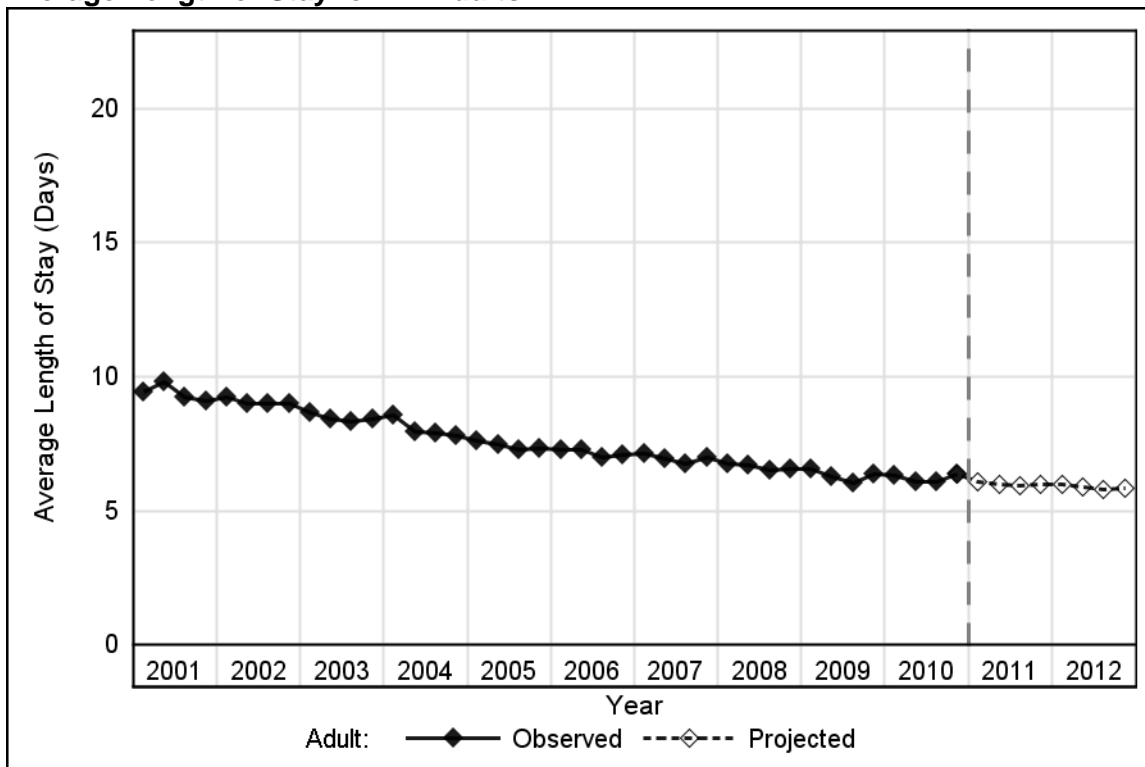
Aortic Resection

Average Length of Stay

Key Findings:

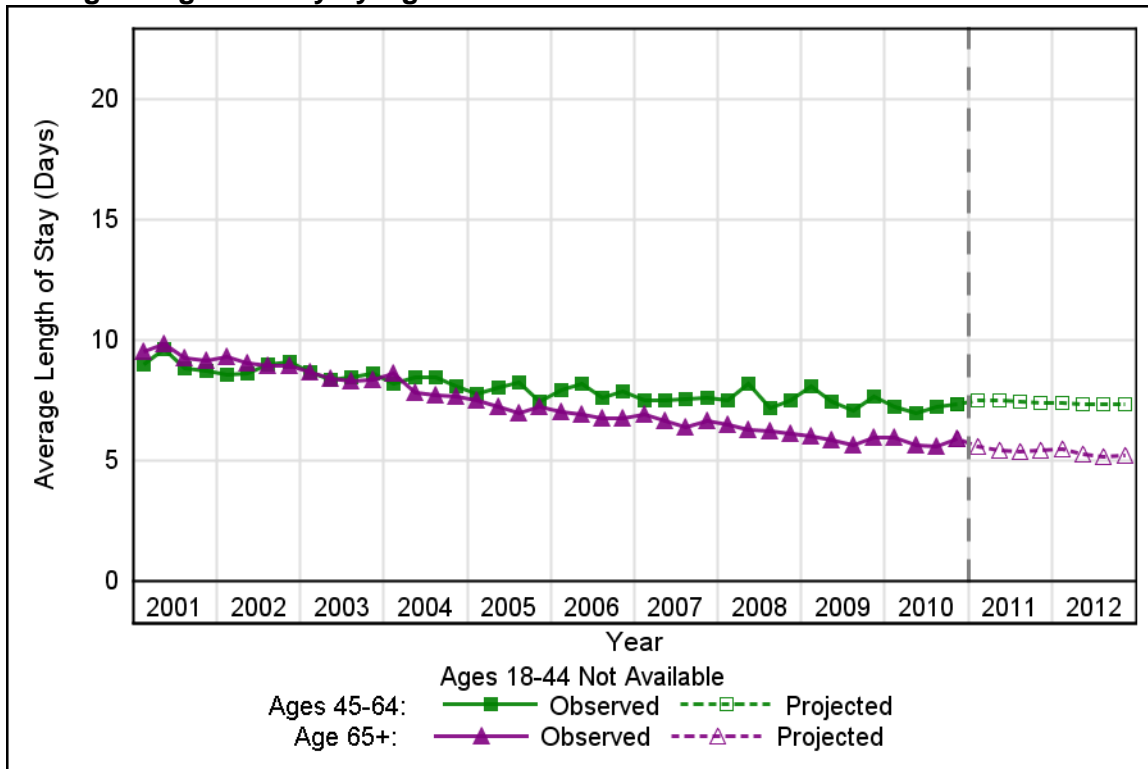
- The length of stay for discharges with aortic resection decreased over time, from 9.4 days in 2001 to 6.2 days in 2010. This decreasing trend is projected to continue in 2011 and 2012, with length of stay projected to be 5.8 days at the end of 2012.
- Length of stay was initially similar for the two older age groups, at about 9.2 days in 2001, but decreased at a greater rate for adults age 65 and older than for adults ages 45 to 64. For adults age 65 and older, length of stay was 5.8 days in 2010. For adults ages 45 to 64, length of stay was 7.2 days in 2010. The length of stay for adults ages 18 to 44 was not included due to the small number of discharges among this age group (about 175 per quarter).
- Length of stay was 2.1 days longer for females than for males. Females had a length of stay that decreased from 11.2 days in 2001 to 7.7 days in 2010. Males had a length of stay that decreased from 8.9 days in 2001 to 5.8 days in 2010.

Average Length of Stay for All Adults

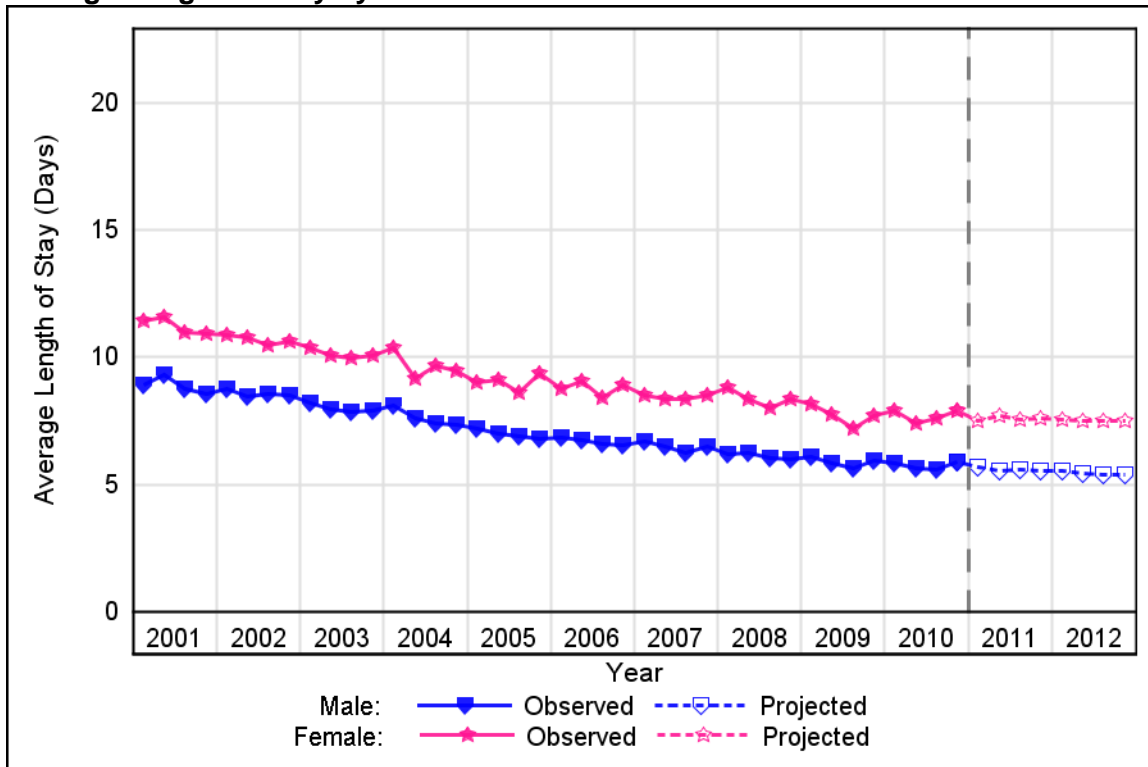


Source: Agency for Healthcare Research and Quality, Center for Delivery, Organization, and Markets, Healthcare Cost and Utilization Project, State Inpatient Databases.

Average Length of Stay by Age



Average Length of Stay by Gender



Source: Agency for Healthcare Research and Quality, Center for Delivery, Organization, and Markets, Healthcare Cost and Utilization Project, State Inpatient Databases.

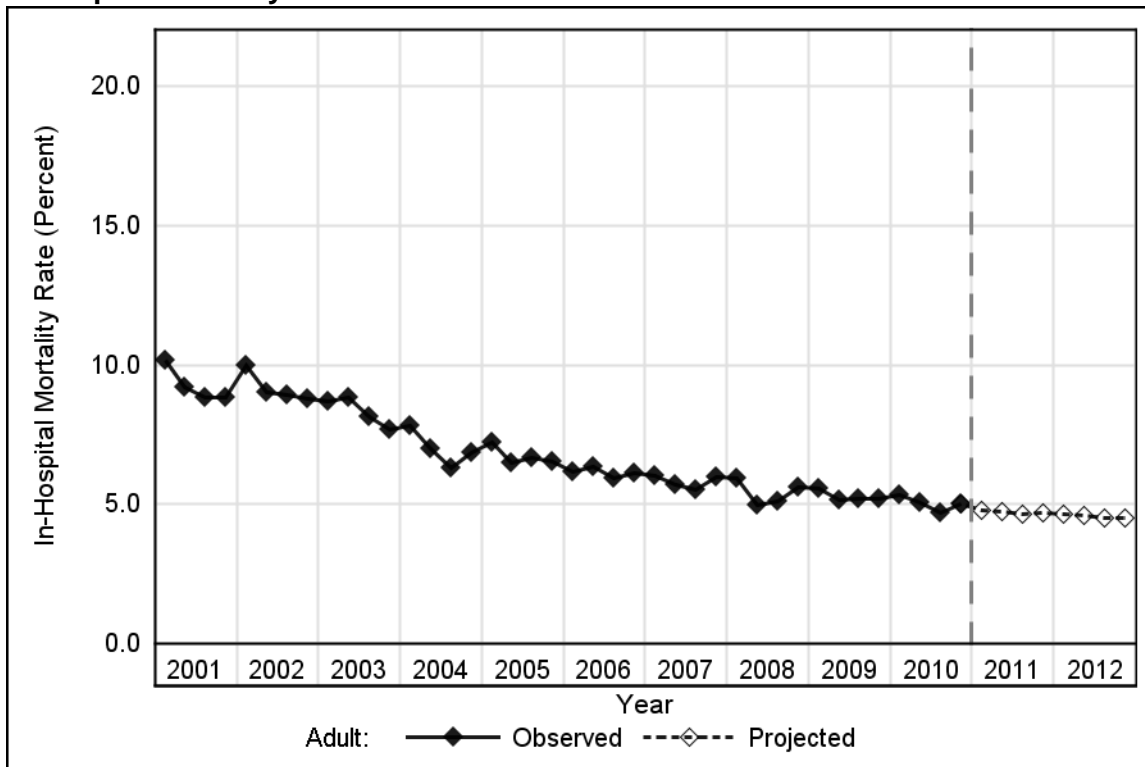
Aortic Resection

In-Hospital Mortality Rate

Key Findings:

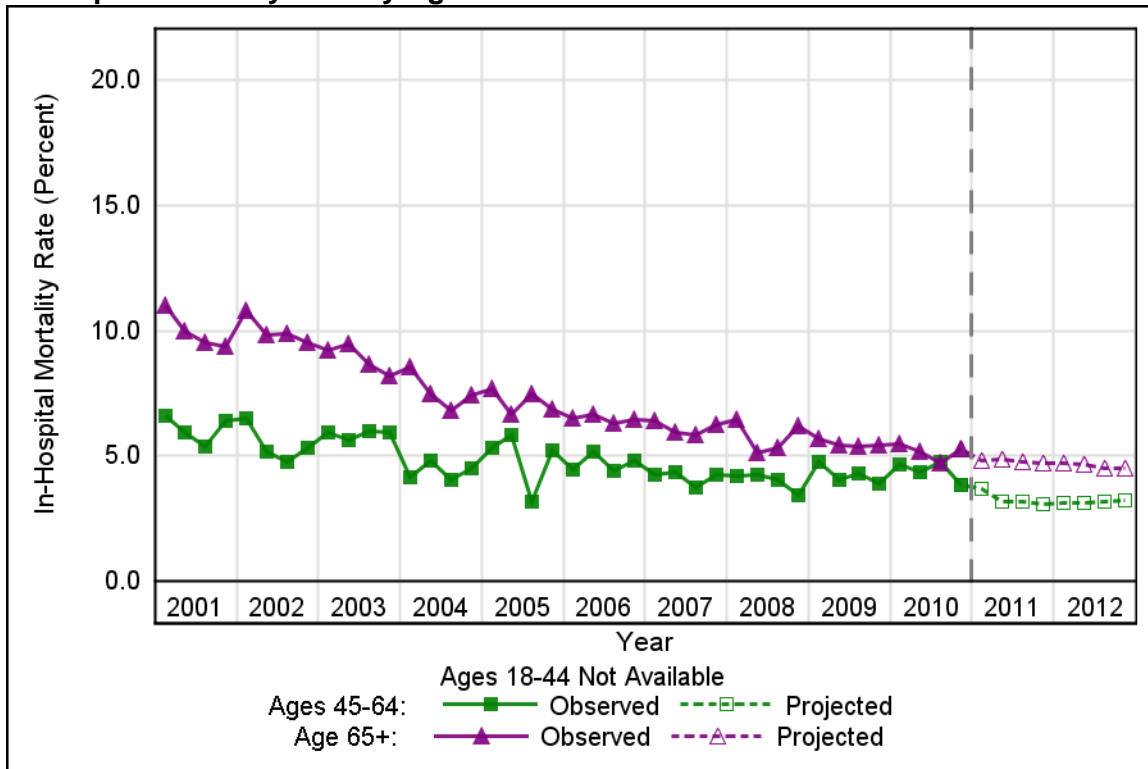
- The mortality rate for discharges with aortic resection decreased over time, from 9.3 percent in 2001 to 5.0 percent in 2010. This decreasing trend is projected to continue in 2011 and 2012, with the mortality rate projected to be 4.5 percent at the end of 2012.
- Adults age 65 and older had the highest mortality rate, at 10.0 percent in 2001 and decreasing to 5.2 percent in 2010. Adults ages 45 to 64 had the next highest mortality rate, at 6.1 percent in 2001 and decreasing to 4.4 percent in 2010. The mortality rate for adults ages 18 to 44 was not included due to the small number of discharges among this age group (about 175 per quarter).
- The mortality rate was 3.5 percentage points higher for females than for males. Females had a mortality rate that decreased from 11.9 percent in 2001 to 7.4 percent in 2010. Males had a mortality rate that decreased from 8.5 percent in 2001 to 4.3 percent in 2010.

In-Hospital Mortality Rate for All Adults

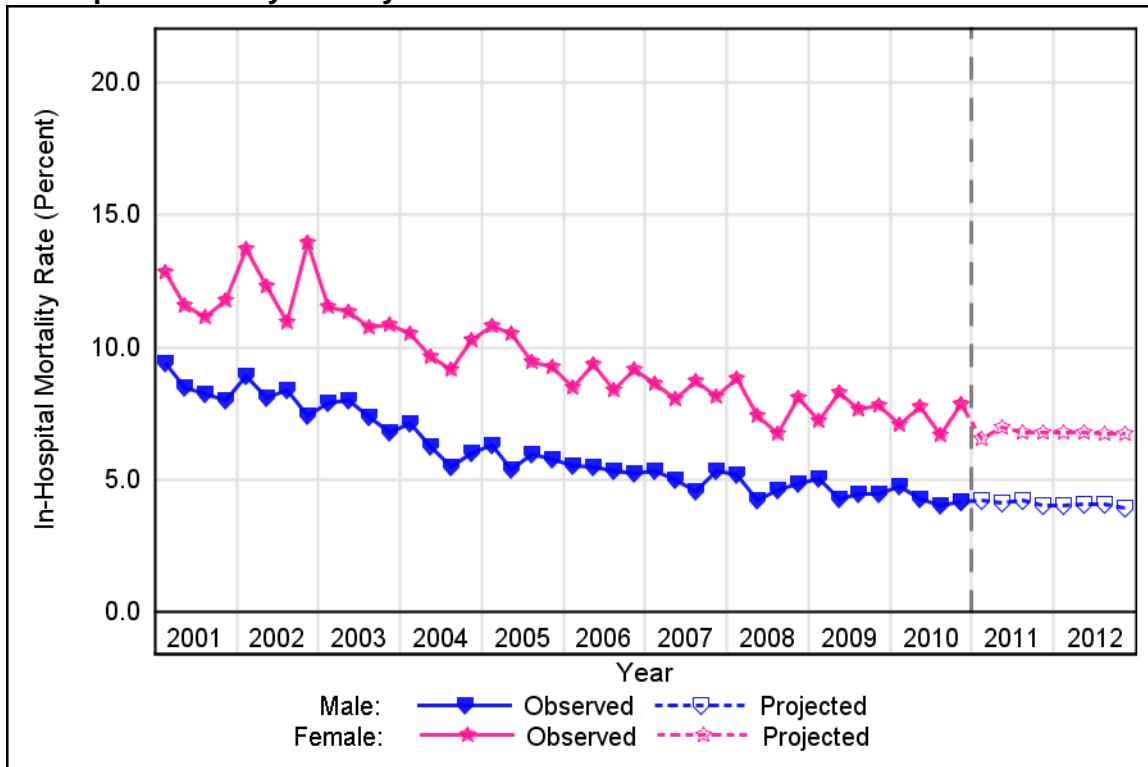


Source: Agency for Healthcare Research and Quality, Center for Delivery, Organization, and Markets, Healthcare Cost and Utilization Project, State Inpatient Databases.

In-Hospital Mortality Rate by Age



In-Hospital Mortality Rate by Gender



Source: Agency for Healthcare Research and Quality, Center for Delivery, Organization, and Markets, Healthcare Cost and Utilization Project, State Inpatient Databases.

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Carotid Endarterectomy

Carotid endarterectomy (CEA) is a procedure in which blockage (plaque) is surgically removed from the carotid artery to improve blood flow to the brain. There are two carotid arteries located in the right and left sides of the neck, and bring oxygen and nutrients to the brain. Using the HCUP SID from 2001 to 2010 and early 2011 data from 10 States, different outcomes for inpatient discharges with CEA are projected for 2011 to 2012.

Projections include the following:

- Total inpatient discharges for all adults, adults by age group, and adults by gender. Discharge counts exclude inpatient stays that were transferred out to another acute care hospital. This ensures that these events are not double counted.
- Average total hospital cost for all adults, adults by age group, and adults by gender. Average total hospital cost reflects actual expenses incurred in the production of hospital services; physician costs are not included. For comparison, a line is included that depicts the change in the average inpatient hospital cost per admission in the first quarter of 2001 (Q1 2001) due solely to economy-wide inflation. The difference between the actual/projected cost line and the inflation-adjusted Q1 2001 cost line represents cost increases due to other non-inflation factors, such as new technology, patient case mix, etc.
- Average length of stay for all adults, adults by age group, and adults by gender. In HCUP, the length of stay counts nights spent in the hospital. If a patient is admitted and discharged on the same day, the length of stay is zero.
- In-hospital mortality rate for all adults, adults by age group, and adults by gender.

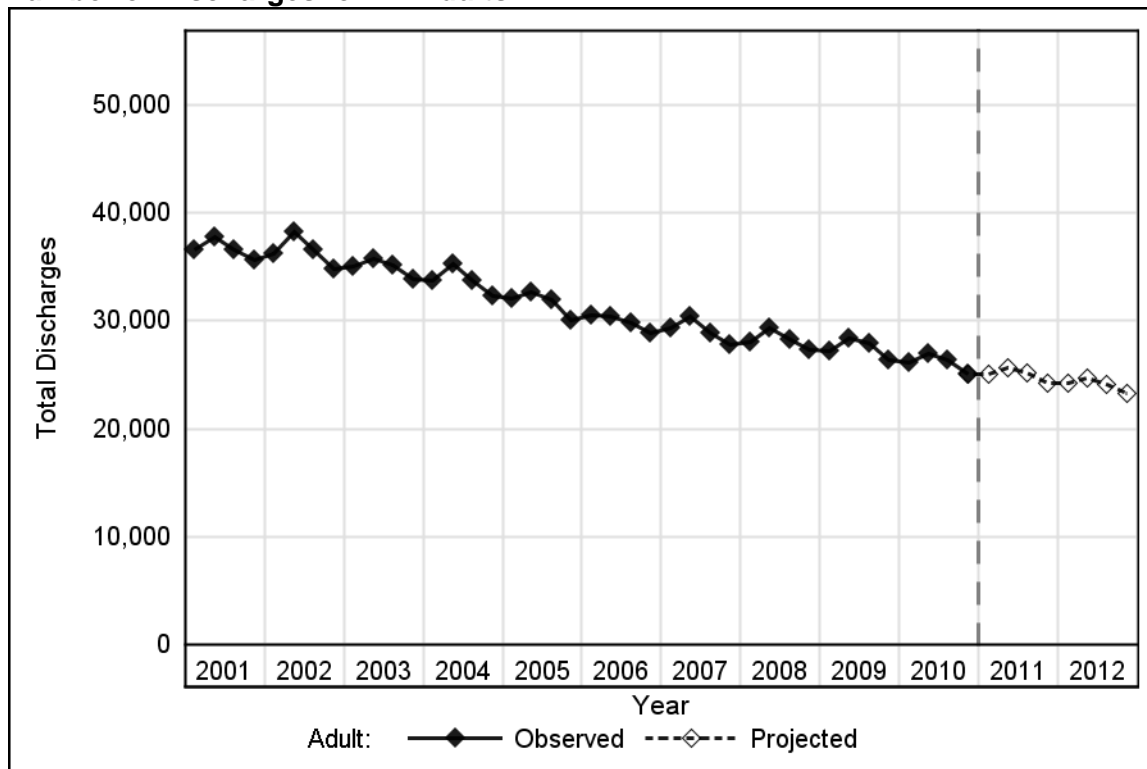
Carotid Endarterectomy

Number of Discharges

Key Findings:

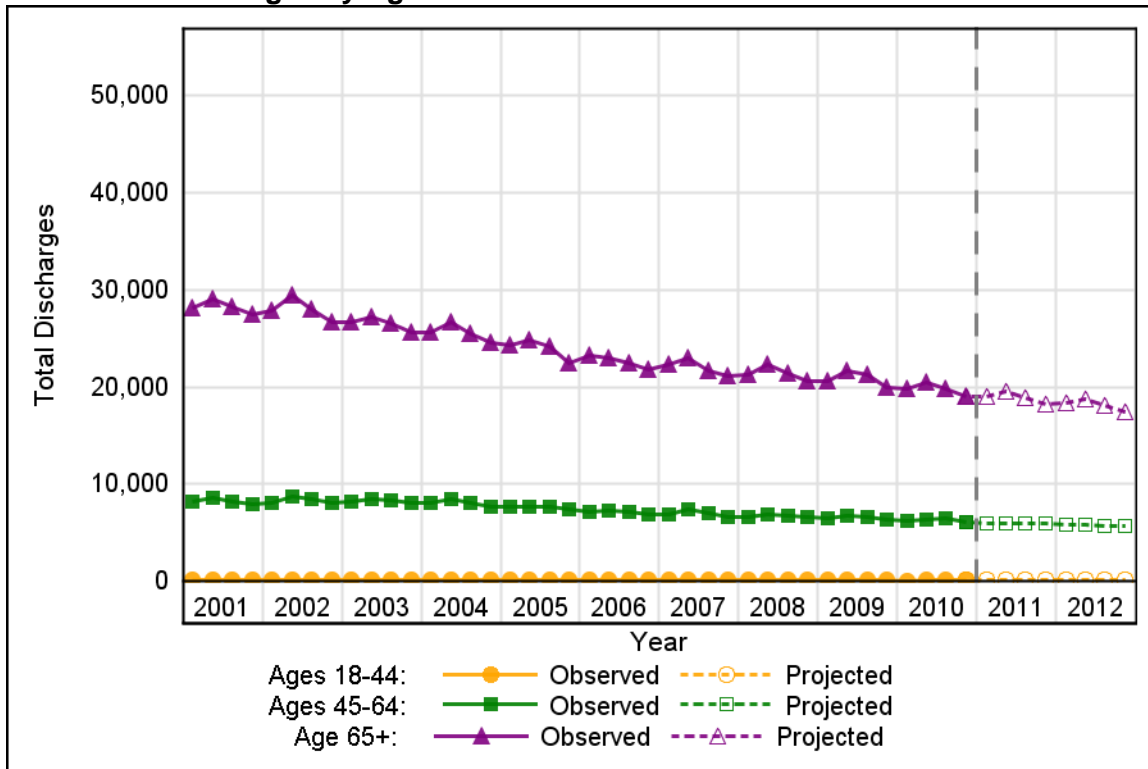
- The number of discharges for CEA decreased over time, from about 36,500 discharges per quarter in 2001 to 26,000 discharges per quarter in 2010. This decreasing trend is projected to continue in 2011 and 2012, with quarterly discharges projected to be about 23,500 at the end of 2012.
- Adults age 65 and older had the highest discharges, at about 28,000 discharges per quarter in 2001 and decreasing to 20,000 discharges per quarter in 2010. Adults ages 45 to 64 had the next highest discharges, at about 8,500 discharges per quarter in 2001 and decreasing to 6,500 discharges per quarter in 2010. Adults ages 18 to 44 had the lowest discharges, at about 175 discharges per quarter in 2001 and decreasing to 100 discharges per quarter in 2010.
- Males had about 5,000 more discharges per quarter than did females. Males had about 21,000 discharges per quarter in 2001, decreasing to 15,000 discharges per quarter in 2010. Females had about 15,500 discharges per quarter in 2001, decreasing to 11,000 discharges per quarter in 2010.

Number of Discharges for All Adults

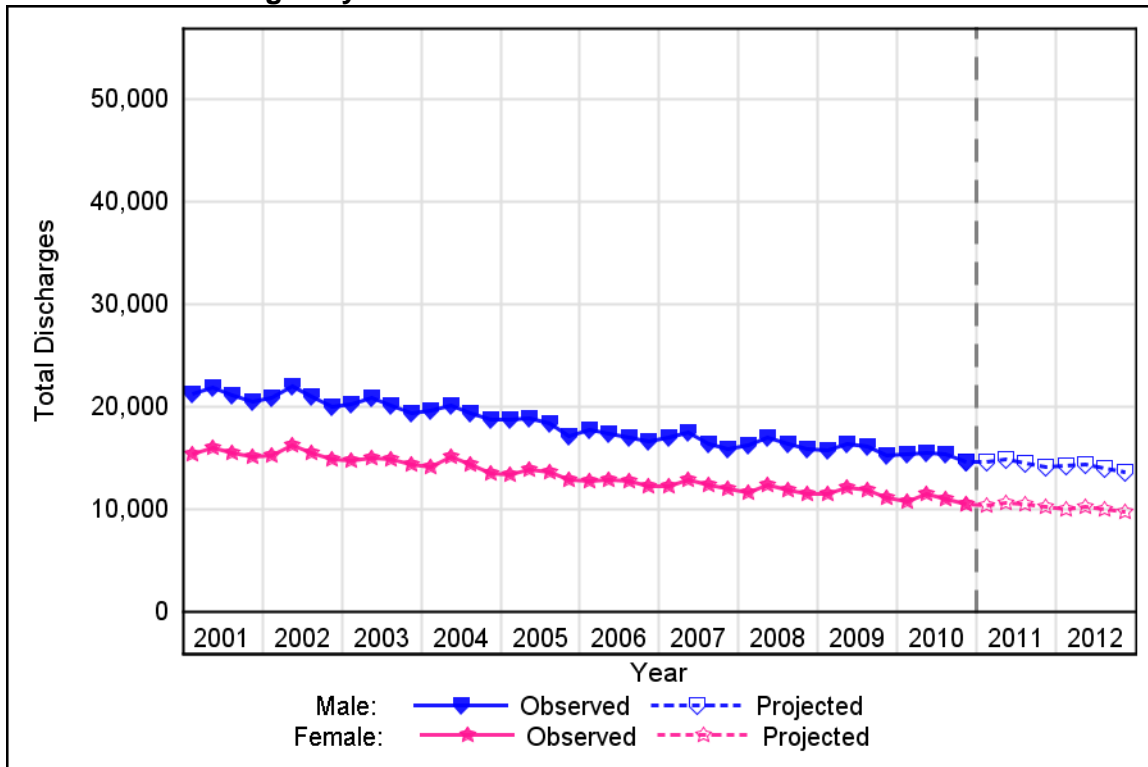


Source: Agency for Healthcare Research and Quality, Center for Delivery, Organization, and Markets, Healthcare Cost and Utilization Project, State Inpatient Databases.

Number of Discharges by Age



Number of Discharges by Gender



Source: Agency for Healthcare Research and Quality, Center for Delivery, Organization, and Markets, Healthcare Cost and Utilization Project, State Inpatient Databases.

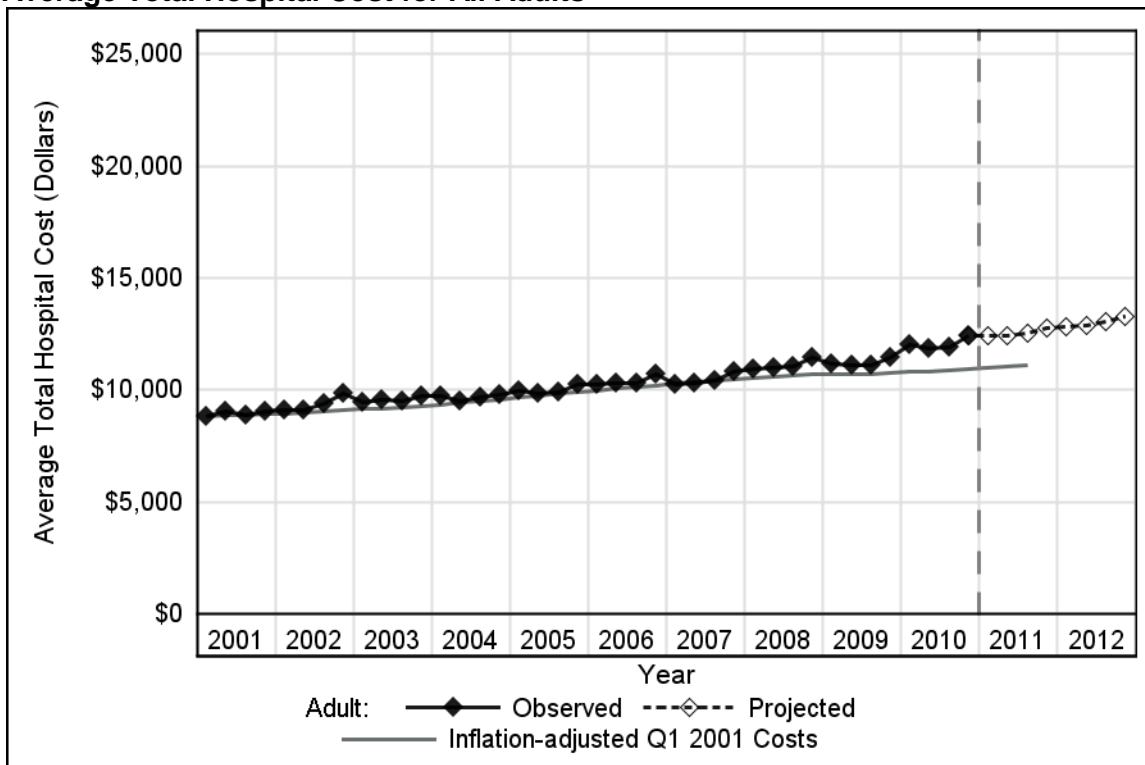
Carotid Endarterectomy

Average Total Hospital Cost

Key Findings:

- The average hospital cost for discharges with CEA increased over time, from about \$9,000 in 2001 to \$12,000 in 2010. This increasing trend is projected to continue in 2011 and 2012, with the average hospital cost projected to be about \$13,500 at the end of 2012.
- The average hospital cost was similar for the two older age groups, increasing from about \$9,000 in 2001 to \$12,000 in 2010. The average hospital cost for adults ages 18 to 44 was not included due to the small number of discharges among this age group (about 125 per quarter).
- The average hospital cost was similar for males and females, increasing from about \$9,000 in 2001 to \$12,000 in 2010.
- Using the Gross Domestic Product (GDP) price index, a cost of \$9,000 in 2001 would be equivalent to a cost of \$11,000 in 2010. The average hospital cost through 2010 remained relatively consistent with the cost expected by inflation alone.

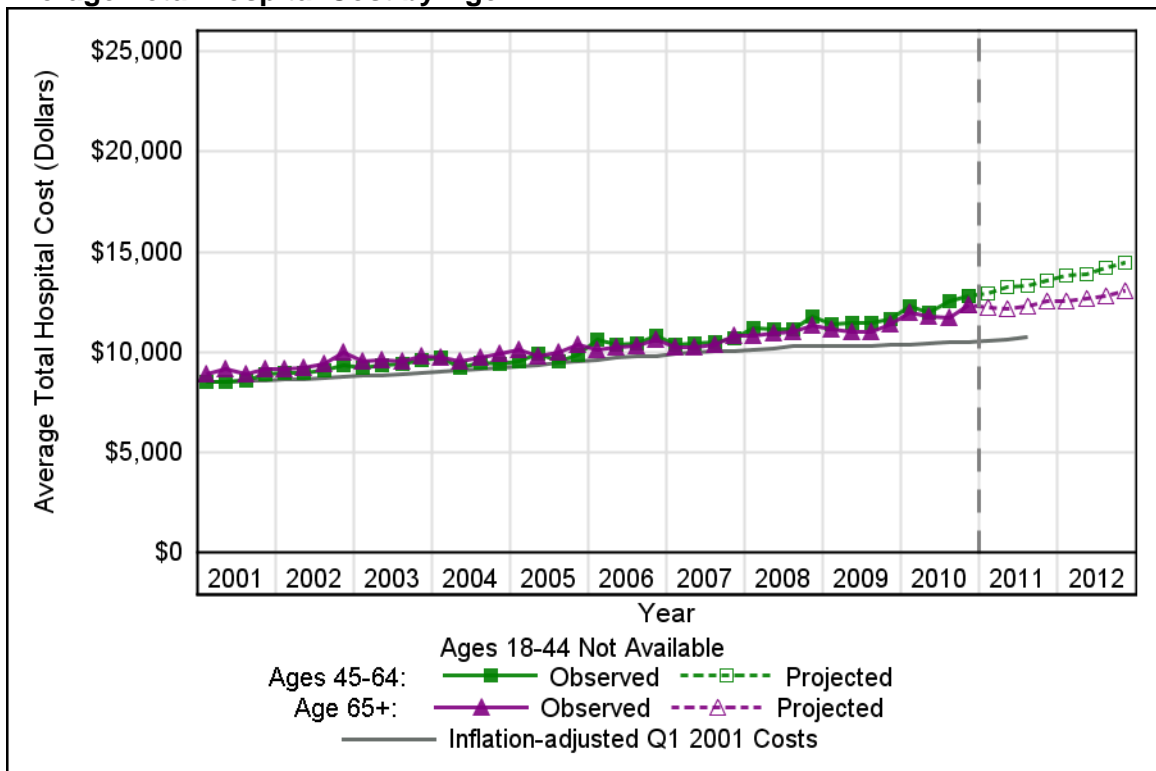
Average Total Hospital Cost for All Adults



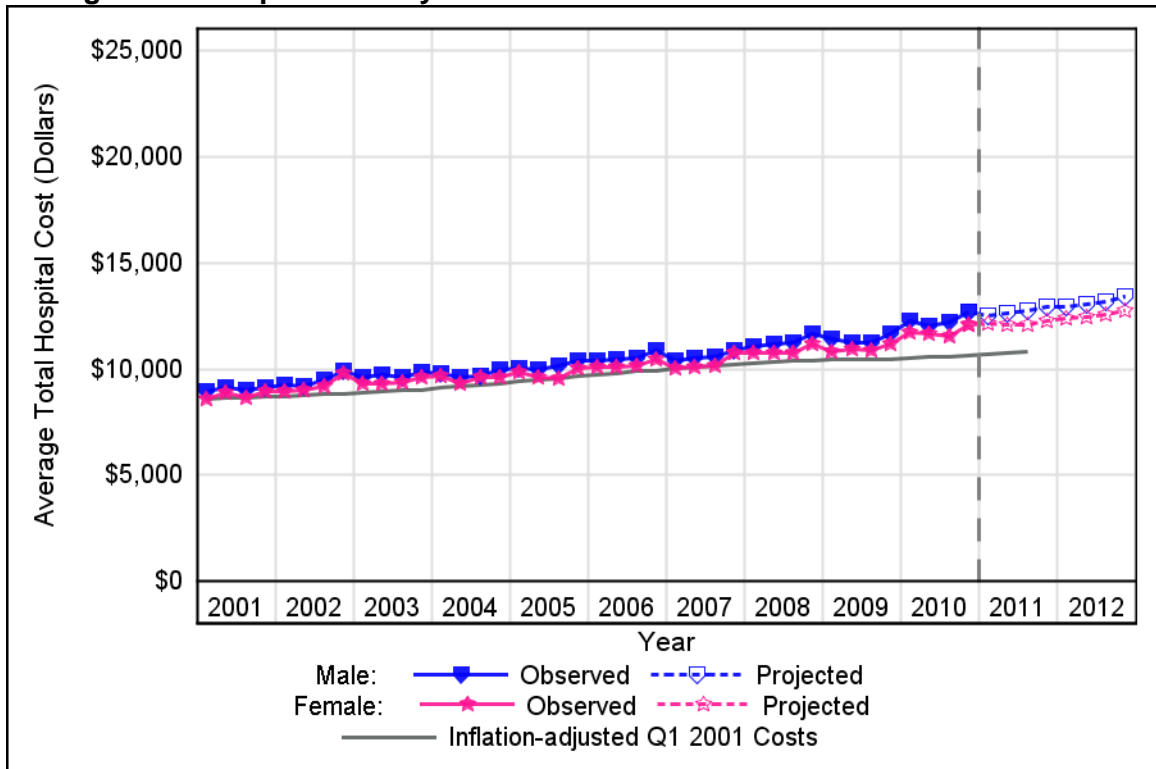
Inflation-adjusted Q1 2001 Costs: Cost per admission in the first quarter of 2001, adjusted for economy-wide inflation.

Source: Agency for Healthcare Research and Quality, Center for Delivery, Organization, and Markets, Healthcare Cost and Utilization Project, State Inpatient Databases.

Average Total Hospital Cost by Age



Average Total Hospital Cost by Gender



Inflation-adjusted Q1 2001 Costs: Cost per admission in the first quarter of 2001, adjusted for economy-wide inflation. Source: Agency for Healthcare Research and Quality, Center for Delivery, Organization, and Markets, Healthcare Cost and Utilization Project, State Inpatient Databases.

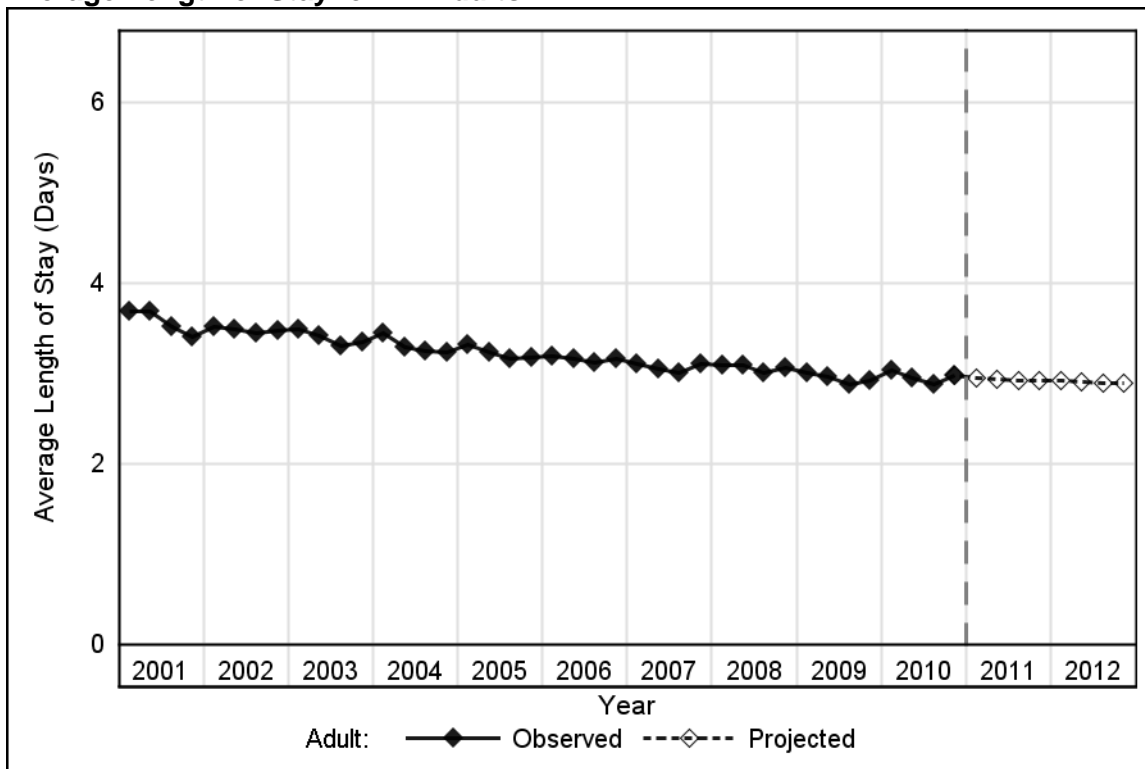
Carotid Endarterectomy

Average Length of Stay

Key Findings:

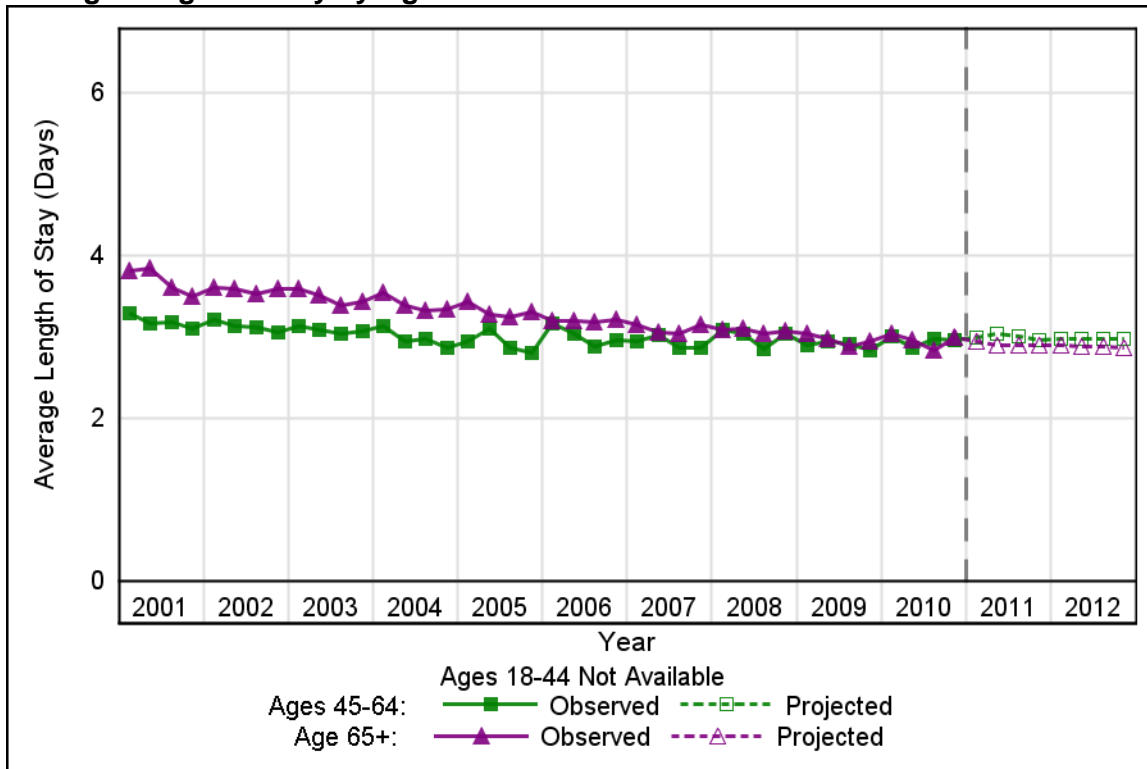
- The length of stay for discharges with CEA decreased over time, from 3.6 days in 2001 to 3.0 days in 2010. This decreasing trend is projected to continue in 2011 and 2012, with length of stay projected to be 2.9 days in 2012.
- Adults age 65 and older had a length of stay that was 0.5 days longer in 2001 than did adults ages 45 to 64. Adults age 65 and older had a length of stay of 3.7 days in 2001. Adults ages 45 to 64 had a length of stay of 3.2 days in 2001. However, this initial difference disappeared over time, with both of the older age groups having a length of stay of 3.0 days in 2010. The length of stay for adults ages 18 to 44 was not included due to the small number of discharges among this age group (about 125 per quarter).
- Length of stay was similar for males and females, decreasing from 3.6 days in 2001 to 3.0 days in 2010.

Average Length of Stay for All Adults

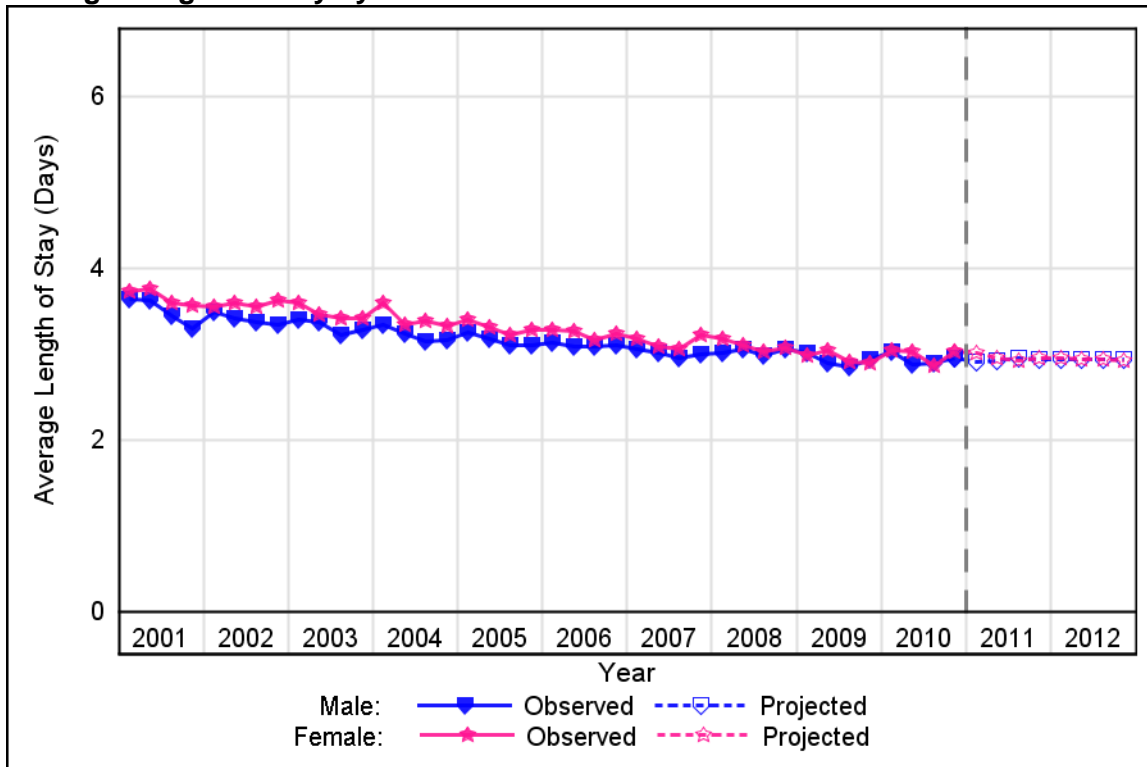


Source: Agency for Healthcare Research and Quality, Center for Delivery, Organization, and Markets, Healthcare Cost and Utilization Project, State Inpatient Databases.

Average Length of Stay by Age



Average Length of Stay by Gender



Source: Agency for Healthcare Research and Quality, Center for Delivery, Organization, and Markets, Healthcare Cost and Utilization Project, State Inpatient Databases.

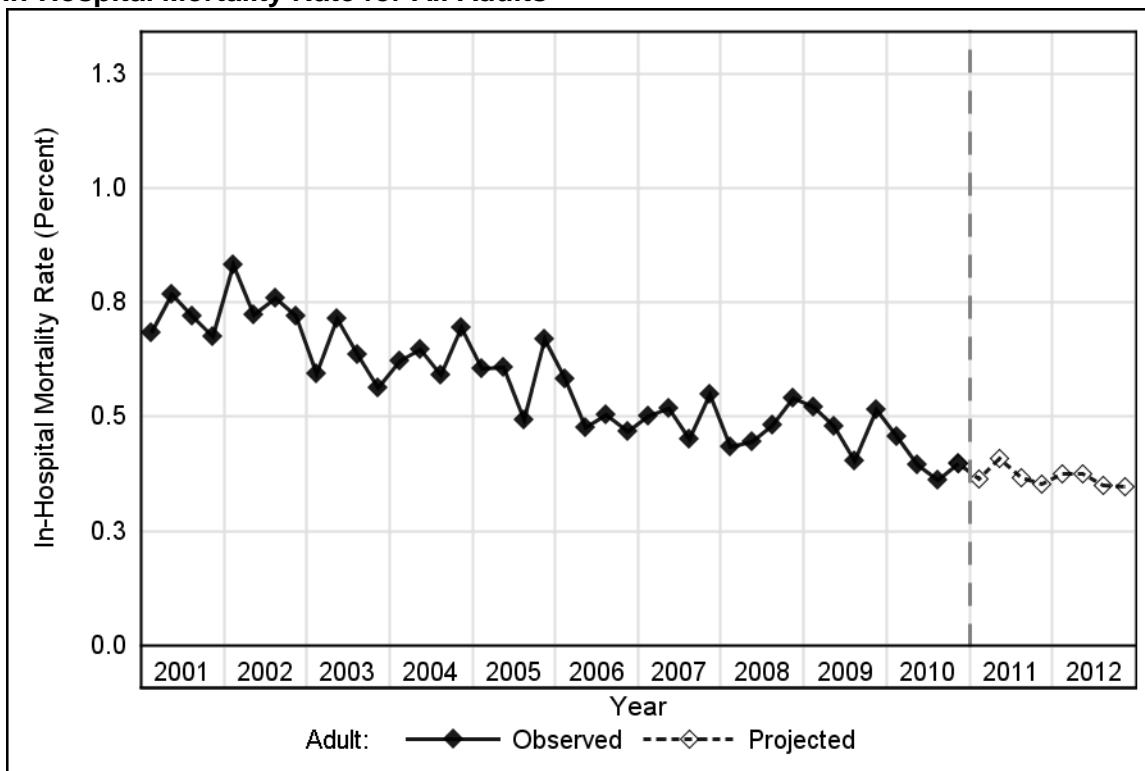
Carotid Endarterectomy

In-Hospital Mortality Rate

Key Findings:

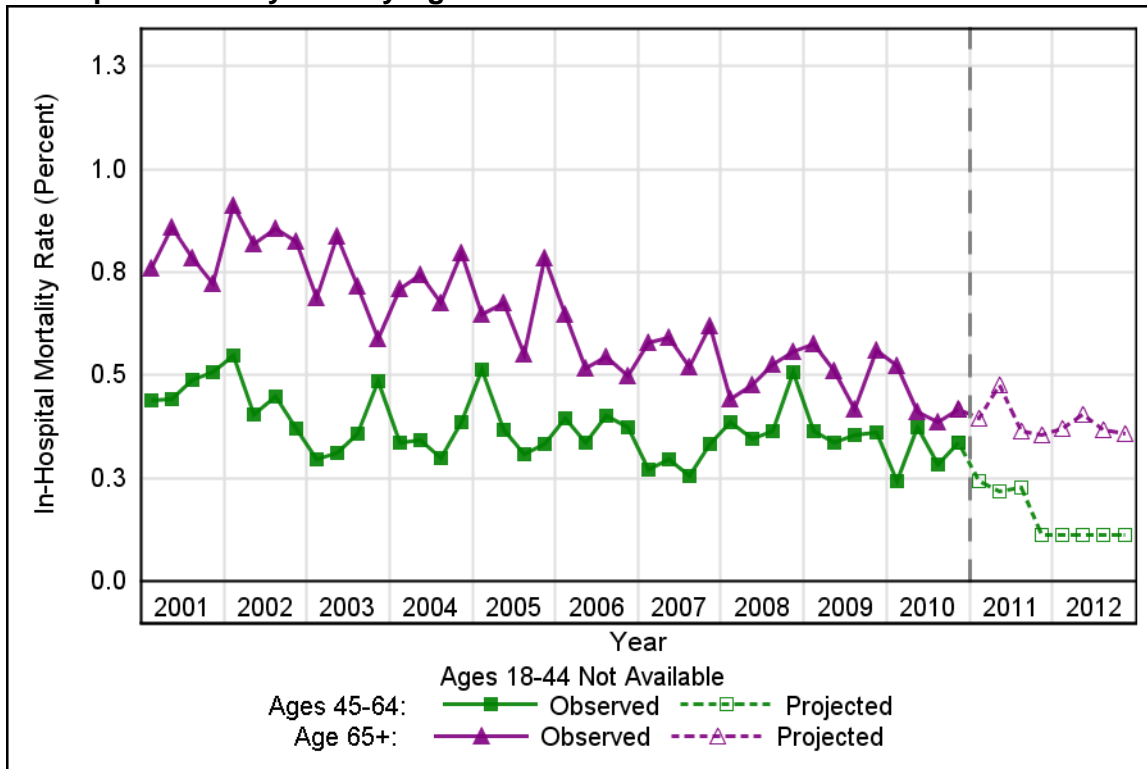
- The mortality rate for discharges with CEA decreased over time, vacillating around 0.7 percent in 2001 and decreasing to 0.4 percent in 2010. The mortality rate is projected to remain at about this same level in 2011 and 2012.
- Adults age 65 and older had the highest mortality rate, at 0.8 percent in 2001 and decreasing to 0.4 percent in 2010. Adults ages 45 to 64 had the lowest mortality rate, at 0.5 percent in 2001 and decreasing to 0.3 percent in 2010. The mortality rate for adults ages 18 to 44 was not included due to the small number of discharges among this age group (about 125 per quarter).
- The mortality rate was similar for males and females, decreasing from 0.7 percent in 2001 to 0.4 percent in 2010.

In-Hospital Mortality Rate for All Adults

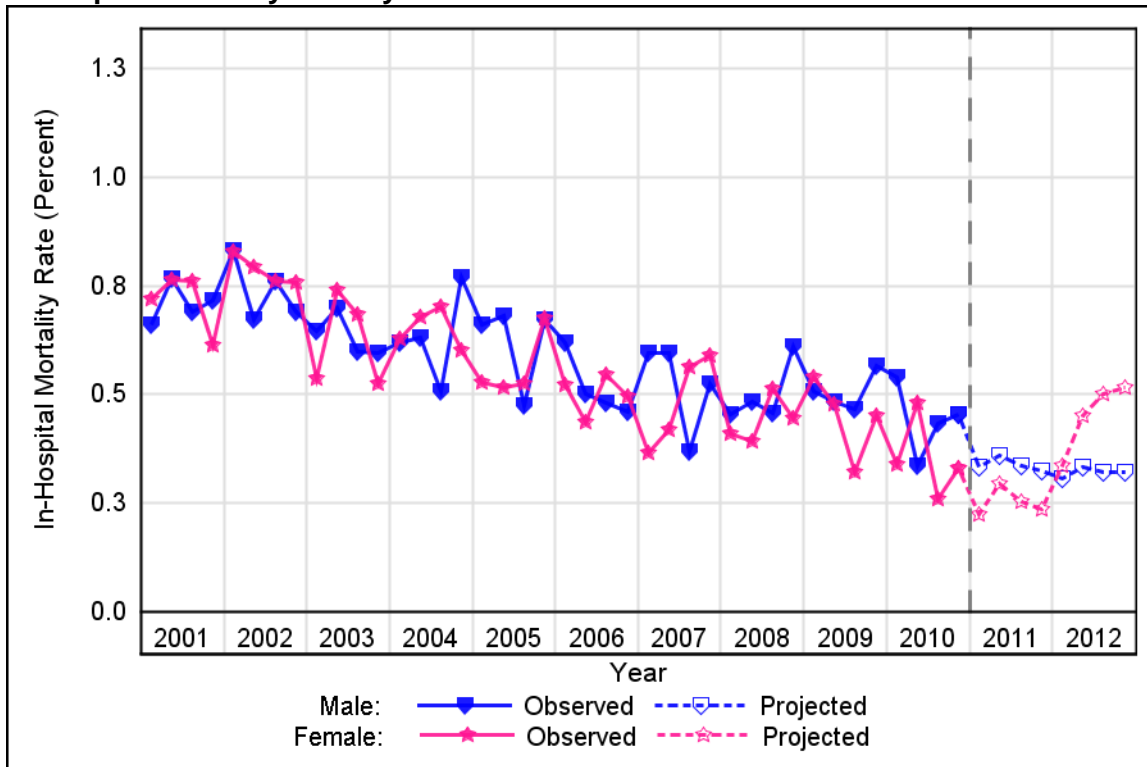


Source: Agency for Healthcare Research and Quality, Center for Delivery, Organization, and Markets, Healthcare Cost and Utilization Project, State Inpatient Databases.

In-Hospital Mortality Rate by Age



In-Hospital Mortality Rate by Gender



Source: Agency for Healthcare Research and Quality, Center for Delivery, Organization, and Markets, Healthcare Cost and Utilization Project, State Inpatient Databases.

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Appendix I: HCUP Data Partners

Alaska State Hospital and Nursing Home Association

Arizona Department of Health Services

Arkansas Department of Health

California Office of Statewide Health Planning and Development

Colorado Hospital Association

Connecticut Hospital Association

Florida Agency for Health Care Administration

Georgia Hospital Association

Hawaii Health Information Corporation

Illinois Department of Public Health

Indiana Hospital Association

Iowa Hospital Association

Kansas Hospital Association

Kentucky Cabinet for Health and Family Services

Louisiana Department of Health and Hospitals

Maine Health Data Organization

Maryland Health Services Cost Review Commission

Massachusetts Division of Health Care Finance and Policy

Michigan Health & Hospital Association

Minnesota Hospital Association

Mississippi Department of Health

Missouri Hospital Industry Data Institute

Montana MHA - An Association of Montana Health Care Providers

Nebraska Hospital Association

Nevada Department of Health and Human Services

New Hampshire Department of Health & Human Services

New Jersey Department of Health

New Mexico Department of Health

New York State Department of Health

North Carolina Department of Health and Human Services

Ohio Hospital Association

Oklahoma State Department of Health

Oregon Association of Hospitals and Health Systems

Oregon Health Policy and Research

Pennsylvania Health Care Cost Containment Council

Rhode Island Department of Health

South Carolina State Budget & Control Board

South Dakota Association of Healthcare Organizations

Tennessee Hospital Association

Texas Department of State Health Services

Utah Department of Health

Vermont Association of Hospitals and Health Systems

Virginia Health Information

Washington State Department of Health

West Virginia Health Care Authority

Wisconsin Department of Health Services

Wyoming Hospital Association

Appendix II: Definitions for Cardiovascular/Cerebrovascular Conditions and Procedures

This section includes the coding criteria used to identify adult discharges with cardiovascular/cerebrovascular conditions and procedures. Coding criteria is based on either International Classification of Diseases, Ninth Revision, Clinical Modification (ICD-9-CM) codes or the HCUP Clinical Classifications Software (CCS). CCS categorizes ICD-9-CM diagnoses and procedures into a manageable number of clinically meaningful categories.⁵ This "clinical grouper" makes it easier to quickly understand patterns of diagnoses and procedures.

Cardiovascular/cerebrovascular conditions are identified using the principal diagnosis which is the condition established to be chiefly responsible for the patient's admission to the hospital. Cardiovascular/cerebrovascular procedures may be reported as a principal or secondary procedure during the inpatient stay.

Outcomes of interest include the following:

- Discharge counts:
Number of discharges that meet the cardiovascular/cerebrovascular coding criteria, excluding discharges transferred out to another acute care hospital
- Average total hospital cost:
$$\frac{\text{Total cost for discharges that meet the cardiovascular/cerebrovascular coding criteria, including transfers}}{\text{Discharge counts (definition above)}}$$
- Average length of stay:
$$\frac{\text{Total days for discharges that meet the cardiovascular/cerebrovascular coding criteria, including transfers}}{\text{Discharge counts (definition above)}}$$
- Mortality rate:
$$\frac{\text{Number of discharges that meet the cardiovascular/cerebrovascular coding criteria, with discharge disposition of died}}{\text{Discharge counts (definition above)}}$$

Outcome of interest also reported by adult age group (18-44, 45-64, and 65 and above) and by gender.

⁵ HCUP CCS. Healthcare Cost and Utilization Project (HCUP). June 2009. U.S. Agency for Healthcare Research and Quality, Rockville, MD. www.hcup-us.ahrq.gov/toolssoftware/ccs/ccs.jsp.

Appendix II: Definitions for Cardiovascular/Cerebrovascular Conditions and Procedures

Cardiovascular and Cerebrovascular Conditions	
Coding criteria:	<p>Adult discharge (age 18 and older) with a principal diagnosis in CCS 96 to 121</p> <ul style="list-style-type: none"> • 96 Heart valve disorders • 97 Peri-; endo-; and myocarditis; cardiomyopathy • 98 Essential hypertension • 99 Hypertension with complications and secondary hypertension • 100 Acute myocardial infarction • 101 Coronary atherosclerosis and other heart disease • 102 Nonspecific chest pain • 103 Pulmonary heart disease • 104 Other and ill-defined heart disease • 105 Conduction disorders • 106 Cardiac dysrhythmias • 107 Cardiac arrest and ventricular fibrillation • 108 Congestive heart failure; non-hypertensive • 109 Acute cerebrovascular disease • 110 Occlusion or stenosis of precerebral arteries • 111 Other and ill-defined cerebrovascular disease • 112 Transient cerebral ischemia • 113 Late effects of cerebrovascular disease • 114 Peripheral and visceral atherosclerosis • 115 Aortic; peripheral; and visceral artery aneurysms • 116 Aortic and peripheral arterial embolism or thrombosis • 117 Other circulatory disease • 118 Phlebitis; thrombophlebitis and thromboembolism • 119 Varicose veins of lower extremity • 120 Hemorrhoids • 121 Other diseases of veins and lymphatics

Appendix II: Definitions for Cardiovascular/Cerebrovascular Conditions and Procedures

Acute Myocardial Infarction (AMI)	
Coding criteria:	Adult discharge (age 18 and older) with a principal diagnosis of CCS 100 <i>Acute myocardial infarction</i>

Coronary Artery Disease (CAD)/ Coronary Atherosclerosis	
Coding criteria:	Adult discharge (age 18 and older) with a principal diagnosis of CCS 101 <i>Coronary atherosclerosis and other heart disease</i>

Congestive Heart Failure (CHF)	
Coding criteria:	Adult discharge (age 18 and older) with a principal diagnosis of CCS 108 <i>Congestive heart failure; non-hypertensive</i>

Stroke/Acute Cerebrovascular Disease	
Coding criteria:	Adult discharge (age 18 and older) with a principal diagnosis of CCS 109 <i>Acute cerebrovascular disease</i>

Atrial Fibrillation	
Coding criteria:	Adult discharge (age 18 and older) with an ICD-9-CM principal diagnosis of 427.31 <i>Atrial fibrillation</i>

Appendix II: Definitions for Cardiovascular/Cerebrovascular Conditions and Procedures

Cardiovascular and Cerebrovascular Procedures	
Coding criteria:	<p>Adult discharge (age 18 and older) with a principal or secondary procedure in CCS 43 to 63</p> <ul style="list-style-type: none"> • 43 Heart valve procedures • 44 Coronary artery bypass graft (CABG) • 45 Percutaneous transluminal coronary angioplasty (PTCA) • 46 Coronary thrombolysis • 47 Diagnostic cardiac catheterization; coronary arteriography • 48 Insertion; revision; replacement; removal of cardiac pacemaker or cardioverter/defibrillator • 49 Other OR heart procedures • 50 Extracorporeal circulation auxiliary to open heart procedures • 51 Endarterectomy; vessel of head and neck • 52 Aortic resection; replacement or anastomosis • 53 Varicose vein stripping; lower limb • 54 Other vascular catheterization; not heart • 55 Peripheral vascular bypass • 56 Other vascular bypass and shunt; not heart • 57 Creation; revision and removal of arteriovenous fistula or vessel-to-vessel cannula for dialysis • 58 Hemodialysis • 59 Other OR procedures on vessels of head and neck • 60 Embolectomy and endarterectomy of lower limbs • 61 Other OR procedures on vessels other than head and neck • 62 Other diagnostic cardiovascular procedures • 63 Other non-OR therapeutic cardiovascular procedures

Appendix II: Definitions for Cardiovascular/Cerebrovascular Conditions and Procedures

Coronary Artery Bypass Graft (CABG)	
Coding criteria:	Adult discharge (age 18 and older) with a principal or secondary procedure of CCS 44 <i>Coronary artery bypass graft</i>

Percutaneous Transluminal Coronary Angioplasty (PTCA) without Stents	
Coding criteria:	<p>Adult discharge (age 18 and older) with a principal or secondary procedure of CCS 45 <i>Percutaneous transluminal coronary angioplasty</i> excluding discharges with any one of the following ICD-9-CM procedure codes:</p> <ul style="list-style-type: none"> • 36.06 Insertion of non-drug-eluting coronary artery stent(s) • 36.07 Insertion of drug-eluting coronary artery stent(s); code effective October 2002 • 00.45 Insertion of one vascular stent; code effective October 2005 • 00.46 Insertion of two vascular stents; code effective October 2005 • 00.47 Insertion of three vascular stents; code effective October 2005 • 00.48 Insertion of four or more vascular stents; code effective October 2005

Percutaneous Transluminal Coronary Angioplasty (PTCA) with Stents	
Coding criteria:	<p>Adult discharge (age 18 and older) with a principal or secondary procedure of CCS 45 <i>Percutaneous transluminal coronary angioplasty</i> and one of the following ICD-9-CM procedure codes:</p> <ul style="list-style-type: none"> • 36.06 Insertion of non-drug-eluting coronary artery stent(s) • 36.07 Insertion of drug-eluting coronary artery stent(s); code is effective as of October 2002

Appendix II: Definitions for Cardiovascular/Cerebrovascular Conditions and Procedures

Aortic Resection	
Coding criteria:	Adult discharge (age 18 and older) with a principal or secondary procedure of CCS 52 <i>Aortic resection; replacement or anastomosis</i>

Carotid Endarterectomy (CEA)	
Coding criteria:	Adult discharge (age 18 and older) with a principal or secondary ICD-9-CM procedure code 38.12 <i>Endarterectomy, other vessels of head and neck</i>

Appendix III: Methods

This appendix describes the methods for projecting national outcomes of inpatient stays using the HCUP State Inpatient Databases (SID). The methodology leverages the breadth of States (up to 46) and longitudinal data (up to ten years) to improve the timeliness of estimates of inpatient statistics. The following factors make this initiative possible:

- the longitudinal nature of HCUP State databases
- the breadth of the databases across 46 States
- the capacity of our HCUP Partners to provide timely quarterly data
- the modeling expertise among HCUP staff, both Federal and contract
- the use of recently-released SAS Econometric Time Series® Software
- the automated assembly of analytic results into a streamlined, ready-to-deliver report using technology developed for another AHRQ product, the State Snapshots (developed in conjunction with the National Healthcare Quality and Disparities Reports).

HCUP includes the largest collection of longitudinal hospital care data in the United States, with all-payer, encounter-level information beginning in 1988. The number of HCUP Partners has expanded over the years to include an ever-larger percentage of hospital discharges nationwide. In fact, the 2010 HCUP State Inpatient Databases (SID) encompass more than 97 percent of all U.S. community hospital discharges, made possible by the data collection efforts of State data organizations, hospital associations, private data organizations, and the Federal government. The list of statewide data organizations that contribute to HCUP databases is available in Appendix I. Although full-year administrative hospital data typically lag the current calendar year by nine to 15 months, some HCUP Partner organizations can now produce quarterly data files within four to six months following the close of a quarter. This “early” data is used to inform the projection models.

Discharges from the SID were limited to those from hospitals that were open during any part of each calendar year and were designated as community hospitals by the American Hospital Association (AHA) Annual Survey of Hospitals, excluding rehabilitation hospitals. The definition of a community hospital was that used by the AHA: “all nonfederal short-term general and other specialty hospitals, excluding hospital units of institutions.”

Projected outcomes include the following:

- Count of inpatient discharges
- Average total cost for inpatient stay
- Average length of stay
- In-hospital mortality rate.

Appendix III: Methods

Total hospital charges were converted to costs using HCUP cost-to-charge ratios based on hospital accounting reports from the Centers for Medicare & Medicaid Services (CMS).⁶ Costs reflect the actual expenses incurred in the production of hospital services, such as wages, supplies and utility costs, while charges represent the amount a hospital billed for the case. For each hospital, a hospital-wide cost-to-charge ratio is used. Hospital charges reflect the amount the hospital billed for the entire hospital stay and does not include professional (physician) fees. Inflation adjustments were not applied to the observed total cost. Projected total costs will estimate inflated charges. In HCUP, the length of stay counts nights spent in the hospital. If a patient is admitted and discharged on the same day, the length of stay is zero. Each outcome is projected for the measures specified in Appendix II: Definitions.

Projections were generated using the SAS Time Series Forecasting System™ (Version 9.2).⁷ Projections were calculated first by State and then weighted proportionally to the nine Census divisions and the nation. For each State, the software automatically selected from among 40 different time series models the model with the lowest mean absolute percentage error (MAPE) for that State. The in-hospital mortality rate was considered to be a binomial rate taking values between zero and one. Consequently, the time series model fitted the trend in the $\text{logit}(\text{rate}) = \log[\text{rate} / (1 - \text{rate})]$.⁸ The estimated logits were then transformed back to the rate scale and multiplied by 100 for the final projections. This ensured that the final projections could not go below zero or above 100.

National quarterly trends were calculated as a weighted average of the State-level quarterly trends within each division. Each State's weight was proportional to its total number of discharges (excluding newborns) as reported in the AHA Hospital Survey. These AHA-based weights were used throughout the period, 2001-2012. For 2011, we had early quarterly data for 10 States. The 2011 projections incorporated observed rates for these 10 States and incorporated rates estimated from time series models for the remaining States. For 2012, the projections were entirely based on rates estimated from time series models.

Table A summarizes the data available from States in each division and each State's percentage of its division's discharges. Rows highlighted in red represent States for which no data were available throughout the period. These missing States represent small percentages of the total division discharges except for the East South Central division, which is missing data from Alabama, constituting about 26% of discharges. The yellow cells in Table A indicate missing years of data for States that contributed to the projections. The green cells in Table A highlight States for which "early" 2011 data were incorporated into the projections. In the Middle Atlantic, Pacific, and West North Central divisions, States with early data represent more than half of the population in the division.

⁶ HCUP Cost-to-Charge Ratio Files (CCR). Healthcare Cost and Utilization Project (HCUP). 2001–2008. U.S. Agency for Healthcare Research and Quality, Rockville, MD. www.hcup-us.ahrq.gov/db/state/costtocharge.jsp.

⁷ *Large-Scale Automatic Forecasting Using Inputs and Calendar Events*. White Paper, SAS Institute Inc., 2009.

⁸ Very rarely, an observed rate was equal to zero. In those cases, a rate of .0001 is substituted so that the logit would be defined and estimation could proceed.

**HCUP Projections:
Cardiovascular/Cerebrovascular Conditions and Procedures**

Table A. Available Data for Cardiovascular/Cerebrovascular Projections

		Calendar year											Total Qtrs	Percent of 2010 Total Division Discharges
		2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011		
		Qtrs	Qtrs	Qtrs	Qtrs	Qtrs	Qtrs	Qtrs	Qtrs	Qtrs	Qtrs	Qtrs		
Division	State													
East North Central	IL	4	4	4	4	4	4	4	4	4	4	0	40	27.9
	IN	0	0	4	4	4	4	4	4	4	4	0	32	13.8
	MI	4	4	4	4	4	4	4	4	4	4	0	40	21.4
	OH	0	4	4	4	4	4	4	4	4	4	0	36	24.7
	WI	4	4	4	4	4	4	4	4	4	4	0	40	12.2
East South Central	AL	0	0	0	0	0	0	0	0	0	0	0	0	25.7
	KY	4	4	4	4	4	4	4	4	4	4	2	42	23.6
	MS	0	0	0	0	0	0	0	0	0	4	0	4	16.2
	TN	4	4	4	4	4	4	4	4	4	4	0	40	34.5
Middle Atlantic	NJ	4	4	4	4	4	4	4	4	4	4	3	43	21.3
	NY	4	4	4	4	4	4	4	4	4	4	1	41	47.9
	PA	4	4	4	0	0	0	0	4	4	4	0	24	30.7
Mountain	AZ	4	4	4	4	4	4	4	4	4	4	2	42	30.1
	CO	4	4	4	4	4	4	4	4	4	4	0	40	22.7
	ID	0	0	0	0	0	0	0	0	0	0	0	0	7.0
	MT	0	0	0	0	0	0	0	0	4	4	0	8	4.4
	NM	0	0	0	0	0	0	0	0	4	4	0	8	9.0
	NV	0	4	4	4	4	4	4	4	4	4	0	36	11.8
	UT	4	4	4	4	4	4	4	4	4	4	0	40	12.7
	WY	0	0	0	0	0	0	0	4	4	4	0	16	2.4
New England	CT	4	4	4	4	4	4	4	4	4	4	0	40	24.5
	MA	4	4	4	4	4	4	4	4	4	4	0	40	45.5
	ME	4	4	4	0	0	4	4	4	4	0	0	28	9.2
	NH	0	0	4	4	4	4	4	4	4	0	0	28	9.2
	RI	4	4	4	4	4	4	4	4	4	4	0	40	7.3
	VT	4	4	4	4	4	4	4	4	4	4	0	40	4.3
Pacific	AK	0	0	0	0	0	0	0	0	0	4	0	4	1.4
	CA	4	4	4	4	4	4	4	4	4	4	2	42	75.1
	HI	4	4	4	4	4	4	4	4	4	4	3	43	2.6
	OR	4	4	4	4	4	4	4	4	4	4	0	40	7.7
	WA	4	4	4	4	4	4	4	4	4	4	0	40	13.3

**HCUP Projections:
Cardiovascular/Cerebrovascular Conditions and Procedures**

		Calendar year											Total Qtrs	Percent of 2010 Total Division Discharges
		2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011		
		Qtrs	Qtrs	Qtrs	Qtrs	Qtrs	Qtrs	Qtrs	Qtrs	Qtrs	Qtrs	Qtrs		
South Atlantic	DC	0	0	0	0	0	0	0	0	0	0	0	0	0
	DE	0	0	0	0	0	0	0	0	0	0	0	0	0
	FL	4	4	4	4	4	4	4	4	4	4	0	40	
	GA	4	4	4	4	4	4	4	4	4	4	3	43	
	MD	4	4	4	4	4	4	4	4	4	4	0	40	
	NC	4	4	4	4	4	4	4	4	4	4	0	40	
	SC	4	4	4	4	4	4	4	4	4	4	0	40	
	VA	4	4	4	4	0	4	4	4	4	4	2	38	
	WV	4	4	4	4	4	4	4	4	4	4	0	40	
West North Central	IA	4	4	4	4	4	4	4	4	4	4	0	40	
	KS	4	4	4	4	4	4	4	4	4	4	0	40	
	MN	4	4	4	4	4	4	4	4	4	4	3	43	
	MO	4	4	4	4	4	4	4	4	4	4	3	43	
	ND	0	0	0	0	0	0	0	0	0	0	0	0	
	NE	4	4	4	4	4	4	4	4	4	4	0	40	
	SD	0	4	4	4	4	4	4	4	4	4	0	40	
West South Central	AR	0	0	0	4	4	4	4	4	4	4	0	28	
	LA	0	0	0	0	0	0	0	4	4	4	0	12	
	OK	0	0	0	0	4	4	4	4	4	4	0	24	
	TX	4	4	4	4	4	4	4	4	4	4	0	40	