DATABOOK

Preventable Hospitalizations in Connecticut: *Assessing Access to Community Health Services*

FYs 2000 - 2004

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Executive Summary

Preventable Hospitalizations in Connecticut: Assessing Access to Community Health Services

"Preventable hospitalizations" are instances of inpatient hospital care for Ambulatory Care Sensitive Conditions (ACSCs). These conditions are considered "preventable" because timely and effective primary care and medical management have been clinically demonstrated to reduce the need for hospitalization. As a screening tool, preventable hospitalization studies identify possible barriers to primary care, community health resource needs, resource burdens inpatient ACSC care places upon hospitals and payers, and suggest areas of potential cost savings through care alternatives. This study implements a methodology developed by the U.S. Department of Health and Human Services Agency for Healthcare Research and Quality (AHRQ) which states can use to compare themselves to national data.

What Are the Prevention Quality Indicators?

The Prevention Quality Indicators (PQIs) tool developed by AHRQ helps states assess the quality of and access to health care in the community. An AHRQ-sponsored team of clinical researchers identified 16 ACSCs for which effective primary care significantly reduces the incidence of hospitalization. The tool is used to detect potentially avoidable hospital admissions for these 16 illnesses that might have been effectively treated through timely community based primary care.

Using the AHRQ PQIs, the Office of Health Care Access (OHCA) measured hospital admissions for ACSCs utilizing the agency's Connecticut acute care inpatient hospital discharge data. This yielded information helpful in examining the quality of and access to appropriate primary care for these illnesses.

Usefulness of Patient Quality Indicators

Although these indicators are based on hospital inpatient data, they provide insight into the quality of the health care system *outside* the hospital setting. For example, patients with diabetes may be hospitalized for diabetic complications if their conditions are not adequately monitored, if they do not receive proper patient education or if they do not appropriately manage their condition. Although other factors outside the direct control of the health care system such as poor environmental conditions or lack of patient adherence to treatment recommendations can result in hospitalization, the PQIs provide a good starting point for assessing quality of health services in the community.

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Ambulatory Care Sensitive Conditions

AHRQ's PQIs consist of the following 16 ambulatory care sensitive conditions, which are measured as rates of admission to the hospital:

- Bacterial pneumonia
- Dehydration
- Pediatric gastroenteritis
- Urinary tract infections
- Perforated appendix
- Low birth weight
- Angina without an in-hospital procedure
- Congestive heart failure
- Hypertension
- Adult asthma
- Pediatric asthma
- Chronic obstructive pulmonary disease
- Uncontrolled diabetes
- Diabetes, short-term complications
- Diabetes, long-term complications
- Lower extremity amputation among patients with diabetes

With access to high-quality, community based primary care, hospitalizations for these illnesses have been clinically shown to decrease.

Applying the methodology in Connecticut

OHCA has previously published preventable hospitalization studies and regularly provides preventable hospitalization data to municipal health officials, regional agencies coordinating health services, and hospitals for use in health planning and designing community outreach programs. By adopting the newly-available AHRQ methodology, OHCA plans to make regional comparisons once other states publish their studies. In addition, OHCA's use of AHRQ's PQIs will help Connecticut's community health planners identify possible unmet health needs, gaps in local health services, and primary care system quality issues.

By following these clinically validated national standards, this study directly compared Connecticut and its counties to the U.S., finding that Connecticut had a lower prevalence of preventable hospitalizations for 15 of the 16 ACSCs. This analysis focuses mainly on state residents treated at Connecticut hospitals. However, where hospital-specific information is provided, out of state patients treated at Connecticut hospitals were included.

Significant findings

- In FY 2004, there were over 50,000 discharges of Connecticut residents with an ACSC with nearly 300,000 total patient days and associated total charges of almost $900 million.
- ACSC hospitalizations accounted for 13 percent of all inpatient discharges and total hospital charges; and 15 percent of total patient days.
- From FY 2000 through 2004, the number of ACSC discharges grew by seven percent, patient days increased by four percent, and their associated total charges rose by 46 percent.
- Connecticut compared favorably with national ACSC rates, with a lower prevalence of preventable hospitalizations for 15 of the 16 conditions. The incidence of low birth weight babies was the exception, with the state's rate slightly above the U.S. (6.8 versus 6.0 per 100 births).
- ACSC patients tended to require extensive health care resources: nearly two-thirds were hospitalized previously, most were admitted through the Emergency Department (80 percent), and nearly half required additional care after discharge (25 percent transferred to other facilities and 20 percent to home health services).
- While the majority of ACSC hospitalizations were elderly Medicare patients, much of the ACSC growth was among younger patients, particularly those on Medicaid.
- Blacks and Hispanics were more likely than non-Hispanic whites to be hospitalized for ACSCs. Minorities accounted for over half of the recent increase in ACSC hospitalizations.

Preventable Hospitalizations in Connecticut, FYs 2000 - 2004

Introduction

In FY 2004, there were over 50,000 "preventable hospitalizations" of Connecticut residents with nearly 300,000 total patient days and associated total charges of almost $900 million. Preventable hospitalizations are instances of inpatient hospital care for Ambulatory Care Sensitive Conditions (ACSCs). They are considered "preventable" because timely and effective primary care and medical management have been clinically demonstrated to significantly reduce the need for hospitalization for these widespread health conditions.[1] Overall, timely outpatient care and disease management (e.g., regular health care visits, diagnostics, pharmaceuticals and appropriate behaviors) limit the severity of ACSCs and thereby "prevent" the need for hospitalization.[2] Therefore, preventable hospitalization volume highlights the possibility of gaps in the primary care health system, disease management (both by provider and patient) and access to health services that led to the escalation in disease severity and ultimately, hospitalization.

In Connecticut, ACSC patients tend to require extensive health care resources, both within the hospital and following discharge: nearly two-thirds had been previously hospitalized, most were admitted through the Emergency Department (80 percent), and nearly half received additional care after discharge (25 percent transferred to another facility and 20 percent required home health services).

Preventable hospitalizations are increasing in Connecticut. Over the past five years, ACSC discharges grew by seven percent, patient days increased by four percent and their associated total charges rose by 46 percent. ACSC hospitalizations accounted for 13 percent of both inpatient discharges and total hospital charges and 15 percent of total patient days.

What are Prevention Quality Indicators?

The AHRQ Prevention Quality Indicators (PQIs) tool, developed under the auspices of the U.S. Department of Health and Human Services Agency for Healthcare Research and Quality (AHRQ), helps states assess the quality of and access to health care in the community. An AHRQ-sponsored team of clinical researchers identified 16 ACSCs for which effective primary care significantly reduces the incidence of hospitalization. The tool is used to detect potentially avoidable hospital admissions for these 16 illnesses that can be effectively treated with high-quality, community based primary care.

Why Examine Preventable Hospitalizations?

- *As a screening tool to identify possible unmet community health care needs and primary care system quality issues, gaps in local health services, to monitor how well complications from a number of common conditions are being avoided in the outpatient setting and to provide information to local health care systems.*
- *To control health care expenditures by identifying the incidence of costly inpatient acute care that may potentially be reduced through the appropriate use of primary care, case management, outreach and other alternatives. Since public payers account for two-thirds of total preventable hospitalization charges, examining alternatives to inpatient care could result in public savings.*
- *To allow for risk adjusted preventable hospitalization rate comparisons which may illuminate disparities in care.*
- *To isolate financial, socio-cultural, geographic and other structural barriers to adequate primary care.*

Using the AHRQ PQIs, OHCA measured hospital admissions for ACSCs using the agency's Connecticut acute care inpatient hospital discharge data. This yielded information helpful in examining the quality of and access to appropriate primary care for these illnesses.

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Usefulness of Patient Quality Indicators

Although these indicators are based on hospital inpatient data, they provide insight into the quality of the health care system *outside* the hospital setting. For example, patients with diabetes may be hospitalized for diabetic complications if their conditions are not adequately monitored, if they do not receive proper patient education or if they do not appropriately manage their condition. Although other factors outside the direct control of the health care system such as poor environmental conditions or lack of patient adherence to treatment recommendations can result in hospitalization, the PQIs provide a good starting point for assessing quality of health services in the community.

Applying the methodology in Connecticut

OHCA has previously published preventable hospitalization studies and regularly provides preventable hospitalization data to municipal health officials, regional agencies coordinating health services, and hospitals for use in health planning and designing community outreach programs. By adopting the newly-available AHRQ methodology, OHCA plans to make regional comparisons once other states publish their studies. In addition, OHCA's use of AHRQ's PQIs will help Connecticut's community health planners identify possible unmet health needs, gaps in local health services and primary care system quality issues.

By following these national standards that have been clinically validated by AHRQ, this study directly compared Connecticut and its counties to the U.S., finding that Connecticut had a lower prevalence of preventable hospitalizations for 15 of the 16 ambulatory care sensitive conditions. The exception was its slightly higher rate of low birth weight births (6.8 versus 6.0 per 100 births). The tool allows for comparison of admission rates for communities within Connecticut with benchmarks such as the state average or national and regional averages. Following the methodology provided by AHRQ, this analysis focuses on Connecticut residents. However, where hospital-specific information is provided, out of state patients treated at Connecticut hospitals were included.

Despite increased volume of ACSC patients, Connecticut's incidence of preventable hospitalizations is lower than U.S.

From FY 2000 to 2004, rates increased for 12 of the 16 ACSC conditions and total volume of ACSC hospitalizations rose by 7.4 percent.

Compared to the U.S., Connecticut had lower rates for all ACSCs except low birth weight babies, meaning Connecticut residents were less likely to be hospitalized for these conditions.

ACSC Conditions	FY 2004 discharges	2004 rate (per 100,000 people)	Rate change from FY 2000 (%)	CT 2002 rates compared to U.S. 2002 rates
Adult Asthma[1]	3,002	113.9	15.6	-4.8
Angina[1]	853	28.5	-50.7[6]	-20.6
Bacterial Pneumonia[2]	12,236	316.7	5.8	-12.4
Chronic Obstructive Pulmonary Disease[1]	4,563	158.7	-18.0	-28.7
Congestive Heart Failure[1]	11,048	377.9	0.4	-18.3
Dehydration[2]	4,176	109.3	18.31	-11.0
Diabetes Long Term Complication[1]	2,803	102.2	6.9	-8.6
Diabetes Short Term Complication[1]	1,126	44.5	11.1	-11.5
Diabetes Uncontrolled[1]	196	6.5	-9.8	-69.2
Hypertension[1]	654	22.5	38.7	-49.4
Low Birth Weight[4]	2,754	6.6	5.3	15.9
Lower Extremity Amputation[1]	1,008	36.6	-12.2	-1.4
Pediatric Asthma[3]	1,406	155.4	7.4	-22.8
Pediatric Gastroenteritis[3]	486	55.3	25.2	-59.5
Perforated Appendix[4]	970	24.3	-10.1	-16.5
Urinary Tract Infection[2]	4,278	110.2	29.4	-35.7
Totals	50,948[5]	-	-	-

Discharges: Includes all Connecticut resident acute care hospital discharges from Connecticut hospitals with an ACSC diagnosis. For a list of ICD-9-CM codes used to define ACSC conditions see Note 1 in Endnotes (page 19).

Populations used to calculate rates:

[1]Adults - age 18 and older

[2]All Connecticut residents

[3]Children - under the age of 18

[4]Condition specific rates – populations were all births and those who had appendicitis. Low birth weight was included as a "preventable hospitalization" because regular prenatal care and certain maternal behaviors have been shown to reduce the incidence of low birth weight babies. Similarly, prompt care will limit the incidence of an appendix becoming perforated.

[5]Reported total FY 2004 discharges are not the summed total discharges of all of the individual ACSCs. Several patients had more than one ACSC during a hospital stay and therefore they are counted in the individual totals of multiple ACSCs. Fiscal year 2004 overall total discharges (column 2) were presented without any double counting of these discharges.

Rate (per 100,000 people): Rate calculation according to AHRQ guidelines. For each ACSC, the number of hospital discharges was divided by the appropriate population figure and then multiplied by 100,000. Condition specific rates as mentioned above are per 100 births and 100 appendicitis discharges. Rates were also risk adjusted according to age and gender and statistically "smoothed" toward national means. For example, in FY 2004, there were approximately 114 hospitals admissions for adult asthma for every 100,000 Connecticut adults. Significantly higher than average rates may indicate an overuse of inpatient hospital services while significantly lower rates may suggest underutilization.

Rate Change (from FY 2000): A comparison of FY 2000 rates with those of FY 2004. For example, from FY 2000 to 2004, the rate of adult asthma increased by nearly 16 percent.

[6]Changing coding practices contributed to the precipitous decline in the number of angina discharges.

CT Rates Compared to U.S. (2002): Connecticut's 2002 risk adjusted smoothed rates were compared with national figures from that year (most recent rates available). National rates were derived by AHRQ using the Health Cost and Utilization Project State Inpatient Database (HCUP SID), a national database that includes inpatient acute care hospital data from 35 states. Comparing rates, Connecticut's adult asthma rate was 4.8 percent lower than the national rate.

Most average ACSC hospital stays declined, but total patient days grew due to increased ACSC patient volume

From FY 2000 through 2004, the average hospital stay for 15 of the 16 ACSCs declined or stayed the same, possibly due to improved patient management. However, total patient days marginally increased (3.5 percent) due to the increased number of ACSC discharges (7.4 percent). The number of patient days increased from 275,800 to 285,400. Growth in total ACSC patient days (3.5 percent) was considerably smaller than for non-ACSC Connecticut discharges (11.4 percent).

Urinary tract infections, bacterial pneumonia, long term complication of diabetes and congestive heart failure accounted for nearly two-thirds of the increase in total ACSC patient days.

ACSC Conditions	Total hospital days (FY 2004)	Total hospital days change (%) FY 2000 - 2004	Average hospital stay (FY 2004) days	Average hospital stay change (%) FY 2000-2004
Adult Asthma[1]	12,365	19	4.1	-0.9
Angina[1]	1,692	-48.8[5]	2.0	-8.9[5]
Bacterial Pneumonia[2]	66,418	5.2	5.4	-4.5
Chronic Obstructive Pulmonary Disease[1]	23,785	-21.0	5.2	-9.4
Congestive Heart Failure[1]	60,121	3.6	5.4	-2.0
Dehydration[2]	16,366	9.2	3.9	-8.8
Diabetes Long Term Complication[1]	21,618	11.6	7.7	0.0
Diabetes Short Term Complication[1]	4,367	-7.2	3.9	-19.7
Diabetes Uncontrolled[1]	657	-13.1	3.4	-10.9
Hypertension[1]	1,747	25.7	2.7	-10.6
Low Birth Weight[4]	41,960	4.7	15.2	0.4
Lower Extremity Amputation[1]	13,060	3.0	13.0	10.9
Pediatric Asthma[3]	2,919	-9.2	2.1	-10.8
Pediatric Gastroenteritis[3]	1,046	3.8	2.2	-10.1
Perforated Appendix[4]	5,497	14.4	5.7	-2.9
Urinary Tract Infection[2]	19,762	30.0	4.6	-1.3
Totals	285,381[6]	3.5	-	-

Hospital days are based upon hospital stays of all Connecticut residents discharged from Connecticut acute care hospitals with an ACSC diagnosis. For a list of ICD-9-CM codes used to define ACSC conditions see Note 1 in Endnotes (page 19).
ACSC populations:

[1]Adults - age 18 and older
[2]All Connecticut residents
[3]Children - under the age of 18
[4]Condition specific rates – populations were all births and those who had appendicitis. Low birth weight was included as a "preventable hospitalization" because regular prenatal care and certain maternal behaviors have been shown to reduce the incidence of low birth weight babies. Similarly, prompt care will limit the incidence of an appendix becoming perforated. These rates are per 100 births and 100 appendicitis discharges.
[5]Changing coding practices contributed to the precipitous decline in the number of angina discharges and related patient days.
[6]Reported total FY 2004 patient days are not the summed total patient days of all individual ACSCs. Several patients had more than one ACSC during a hospital stay and therefore their total patient days are counted in the individual totals of multiple ACSCs. Fiscal year 2004 overall total patient days (column 2) was presented without any double counting of total patient days for these patients.

Average and total charges for nearly all ACSCs increased

ACSC charges comprised 13 percent of all hospital charges.

From FY 2000 through 2004, ACSC total charges climbed from $611 million to $893 million.

During this time period, the average charge for all ACSCs increased. Only total charges for angina declined, attributable to a change in coding practices.

Congestive heart failure, bacterial pneumonia, low birth weight babies, long term complications of diabetes and urinary tract infections together accounted for nearly 80 percent of the increased charges.

ACSC Conditions	FY 2004 total charges ($)	Total charge change (%) FY 2000 - 2004	Average charge ($)	Average charge change (%) FY 2000-2004
Adult Asthma[1]	34,596,494	56.3	11,524	30.5
Angina[1]	8,629,143	-23.8[5]	10,116	35.7
Bacterial Pneumonia[2]	196,722,535	41.8	16,077	28.8
Chronic Obstructive Pulmonary Disease[1]	69,813,556	3.2	15,300	18.4
Congestive Heart Failure[1]	212,320,641	56.9	19,218	48.4
Dehydration[2]	42,764,095	47.4	10,240	23.0
Diabetes Long Term Complication[1]	69,046,896	58.5	24,633	42.0
Diabetes Short Term Complication[1]	14,835,993	25.2	13,176	8.3
Diabetes Uncontrolled[1]	1,771,198	23.8	9,037	27.0
Hypertension[1]	6,815,085	75.6	10,421	24.9
Low Birth Weight[4]	132,536,199	61.3	48,125	54.8
Lower Extremity Amputation[1]	44,507,518	46.6	44,154	57.8
Pediatric Asthma[3]	8,580,327	40.3	6,103	37.7
Pediatric Gastroenteritis[3]	2,989,681	72.8	6,152	49.7
Perforated Appendix[4]	21,231,981	60.7	21,889	36.3
Urinary Tract Infection[2]	53,188,423	78.9	12,433	35.8
Totals	$892,882,657[6]	46.2	-	-

Hospital charges are based upon charges incurred by all Connecticut residents discharged from Connecticut acute care hospitals with an ACSC diagnosis. For a list of ICD-9-CM codes used to define ACSC conditions see Note 1 in Endnotes (page 19).

ACSC populations:

[1]Adults - age 18 and older

[2]All Connecticut residents

[3]Children - under the age of 18

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[5]Changing coding practices contributed to the precipitous decline in the number of angina discharges and related total charges.

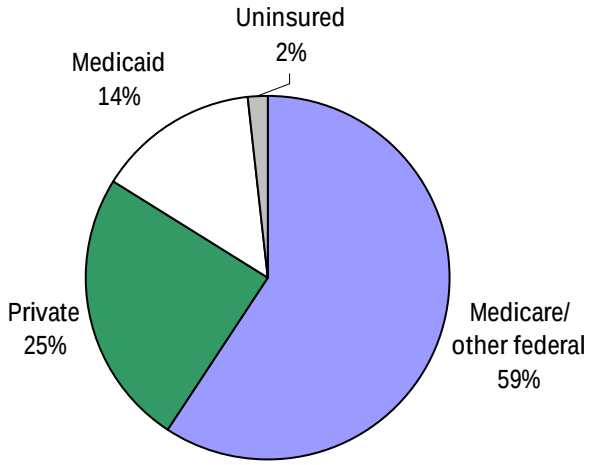
Total Charges ($): Total charges for Connecticut resident ACSC discharges. Due to discounts and other factors, actual payments are significantly lower than charges. In FY 2003, the ratio of charges to payments was 48.6 percent, meaning that total payments were less than half of total charges.

[6]Reported total FY 2004 charges are not the summed total charges of all of the individual ACSCs. Several patients had more than one ACSC during a hospital stay and therefore their total charges are counted in the individual totals of multiple ACSCs. Fiscal year 2004 overall total charges was presented without any double counting of total charges for these patients.

Average Charge ($): The average charge for an ACSC was calculated by dividing total charges by the number of discharges (e.g., adult asthma: $34,596,494/3,002 discharges = $11,524). In FY 2004, the average inpatient hospital charge for all discharges was $17,569.

Medicare was the largest primary payer of ACSC charges

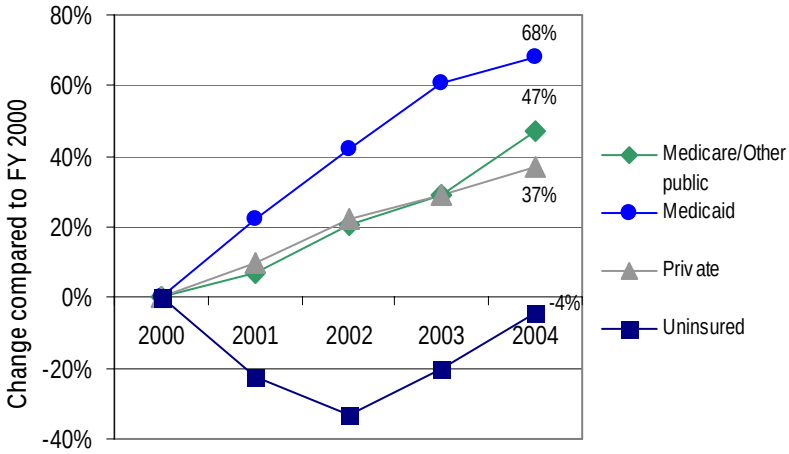
Medicare was responsible for three fifths of total ACSC charges, FY s 2000 - 2004



Medicare's share of total ACSC charges (59 percent) was greater than its share for non-ACSC discharges from Connecticut hospitals (50 percent).[3] This reflects the preponderance of elderly among ACSC discharges (57 percent).

Private payers' combined share of ACSC charges was much smaller than their share of non-ACSC hospital charges (25 percent versus 34 percent).

Medicaid had largest increase in total charges, FYs 2000 - 2004



Medicaid's total ACSC charges grew the largest (68 percent). Rapid annual growth (20 percent) in FYs 2001 and 2002 slowed in subsequent years.

Private payers experienced slow, steady growth in total charges, with a lower cumulative increase than for all payers (37 versus 46 percent).

Medicare total charges cumulatively increased by nearly half.

Uninsured charges declined in 2001 and 2002 and rose sharply over the last two fiscal years.[4]

Primary payers' share of discharges varied by ACSC, FYs 2000 - 2004

Medicare was the primary payer for the largest share of discharges for 10 of the 14 adult ACSCs. It had the largest share of patients for conditions typically more prevalent among the elderly, such as chronic obstructive pulmonary disease, congestive heart failure, lower extremity amputation, bacterial pneumonia, long term complications of diabetes and angina. Nearly all (94 percent) elderly ACSC patients were Medicare recipients.

Medicaid/HUSKY was a significant payer for low birth weight babies and pediatric conditions (asthma and gastroenteritis). HUSKY covered 40 percent of pediatric ACSC hospitalizations, while private payers covered the majority of other pediatric ACSC hospitalizations. Medicaid was also the payer for a disproportionately large share of adults with chronic health conditions (e.g., short term complications of diabetes, adult asthma and uncontrolled diabetes). Private payers together covered less than one-quarter of ACSC discharges, significantly smaller than their combined share of all hospital discharges (42 percent). The uninsured were a small share of ACSC discharges, but represented nearly 10 percent of some chronic conditions (short term diabetes, hypertension) and one emergent condition (perforated appendix).

ACSC	Medicare/ other federal (%)	Medicaid (%)	Private (%)	Uninsured (%)	Totals
Adult Asthma[1]	33	28	33	5	100%
Angina[1]	52	7	38	3	100%
Bacterial Pneumonia[2]	69	10	19	2	100%
Chronic Obstructive Pulmonary Disease[1]	77	7	15	1	100%
Congestive Heart Failure[1]	83	6	10	1	100%
Dehydration[2]	60	12	27	1	100%
Diabetes Long Term Complication[1]	62	12	23	2	100%
Diabetes Short Term Complication[1]	29	29	34	8	100%
Diabetes Uncontrolled[1]	49	22	25	4	100%
Hypertension[1]	44	16	33	7	100%
Low Birth Weight[3]	1	35	61	3	100%
Lower Extremity Amputation[1]	70	9	19	2	100%
Pediatric Asthma[4]	0	53	44	2	100%
Pediatric Gastroenteritis[3]	1	39	58	2	100%
Perforated Appendix[4]	17	15	62	7	100%
Urinary Tract Infection[2]	66	13	20	2	100%
All ACSC Discharges	60%	14%	24%	2%	100%

Total percent may be slightly under or over 100% due to rounding.
Green numbers indicate the largest payers.
Discharges: Includes all Connecticut resident acute care hospital discharges from Connecticut hospitals with an ACSC diagnosis. For a list of ICD-9-CM codes used to define ACSC conditions see Note 1 in Endnotes (page 19).
ACSC populations:

[1]Adults - age 18 and older
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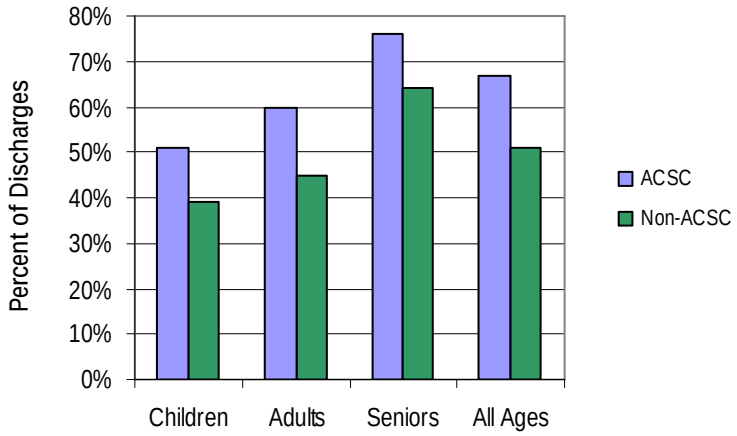
Patients with ACSCs were more frequent consumers of hospital services, regardless of age

Two-thirds of ACSC patients had been previously hospitalized, FYs 2000 - 2004*

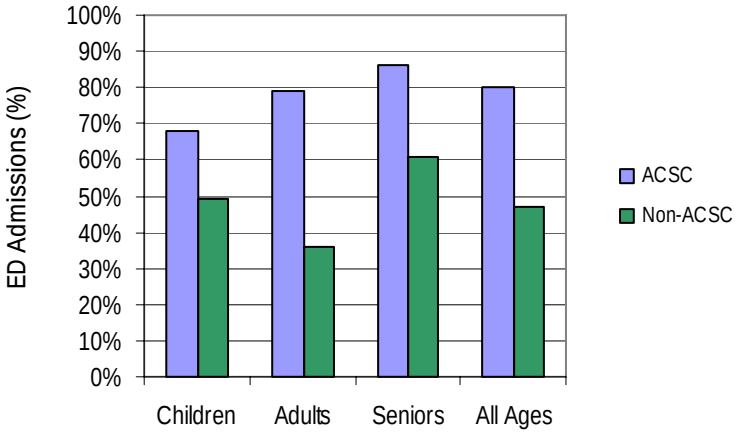


*Excluding newborns.
Children (0—17), adults (18—64), seniors (65+). Previously hospitalized refers to patients with a prior admission at the same hospital currently treating the patient.

Excluding newborns, ACSC patients were more likely to have been hospitalized prior to their current admission than non-ACSC, non-newborn CT resident hospital patients.[5] Within all age groups, ACSC patients were more likely than non-ACSC patients to have been previously hospitalized.

ACSC patients had longer average hospital stays than other patients (5.8 days versus 4.8).

Four of every five ACSC patients were admitted to the hospital through the ED, FYs 2000 - 2004*



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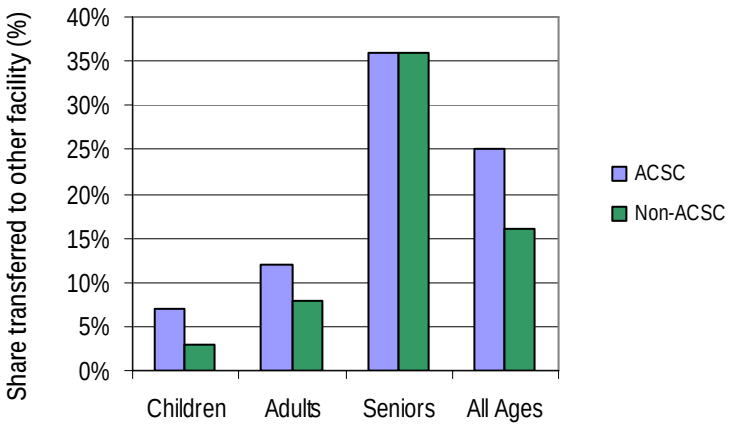
In Connecticut as well as nationally, ACSC patients had significantly higher ED utilization than other types of patients regardless of age.[6] ED use may suggest the need for more extensive case management, particularly as ED use in the prior year is associated with costs in the present year for some of the largest ACSCs.[7]

The number of ACSC patients admitted through the ED increased by 17 percent between 2000 and 2004.

One of every five ED patients admitted to the hospital had an ACSC.

After leaving the hospital, many ACSC patients require additional health care services

One of every four ACSC patients was transferred to another healthcare facility, FYs 2000 - 2004

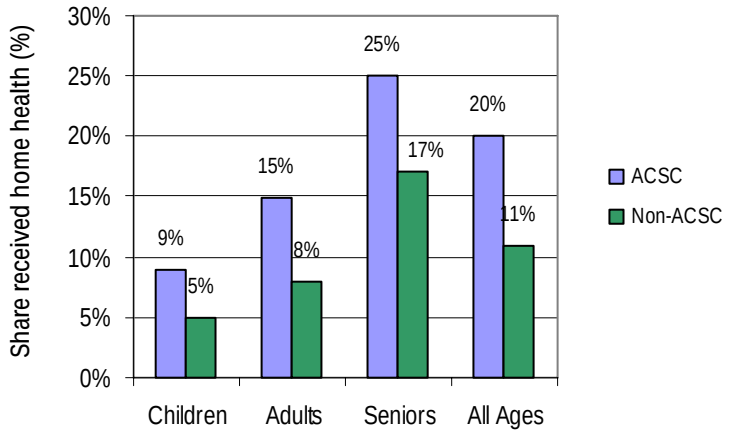


Children (0—17), adults (18—64), seniors (65+). Previously hospitalized refers to patients with a prior admission at the same hospital currently treating the patient.

Regardless of age, ACSC patients were more likely to be transferred to other healthcare facilities or receive home health services.

Eighty percent of all ACSC patient transfers were to skilled nursing facilities.

ACSC patients nearly twice as likely to receive home health care, FYs 2000 - 2004



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For children, working age adults and overall, the proportion of ACSC patients that received home health care services was nearly twice that of non-ACSC patients.

Patients with hypertension, urinary tract infections, bacterial pneumonia, CHF and adult asthma were principal contributors to the growth in transfers to other healthcare facilities and the use of home health care services.

ACSC patients comprised a significant share of community hospitals' volume, FYs 2000 - 2004

ACSC patients were nearly 13 percent of all hospital discharges. For many of Connecticut's smaller hospitals, ACSC discharges represented a large share of patient volume: Bradley (28 percent), Milford (20 percent), Windham (20 percent), Johnson (19 percent), Bristol (18 percent) and Rockville (17 percent).

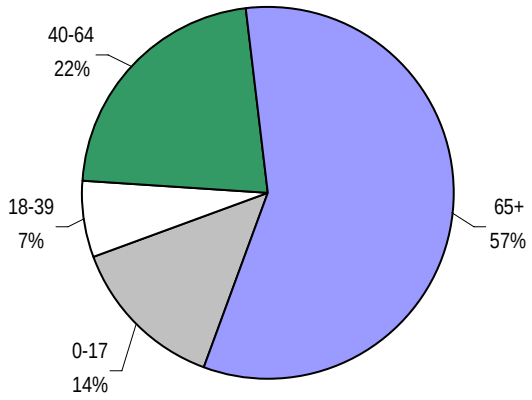
Nearly two-thirds of out of state ACSC discharges were treated at Sharon (21 percent), Greenwich (18 percent), Danbury (9 percent), Yale (5 percent), New Milford (5 percent) and Stamford (5 percent).

Hospital	Average annual ACSC volume	ACSCs as share of hospital discharges
Bradley	703	28.3
Bridgeport	2,172	10.9
Bristol	1,471	18.1
Charlotte Hungerford	986	15.7
CT Children's Medical Center	732	14.6
Danbury	1,907	10.3
Day Kimball	863	14.2
Greenwich	1,021	9.7
Griffin	949	13.5
Hartford	3,182	8.6
Hospital of St. Raphael	3,071	12.6
John Dempsey	916	10.9
Johnson	698	19.2
Lawrence and Memorial	2,243	15.1
Manchester	1,136	13.9
Middlesex	1,447	12.4
MidState	1,421	16.6
Milford	961	20.1
New Britain	2,466	15.3
New Milford	427	13.0
Norwalk	1,861	12.4
Rockville	761	16.8
Sharon	474	15.6
St. Francis	3,343	10.6
St. Mary's	1,965	16.8
St. Vincent's	2,536	13.8
Stamford	2,125	12.1
Waterbury	2,060	14.6
William Backus	1,580	13.6
Windham	990	19.6
Yale	4,315	9.9
Totals	50,781	12.7%

Table includes both Connecticut and out of state residents treated at Connecticut hospitals for an ACSC.
Average annual ACSC volume is each hospital's total number of discharges for FYs 2000 - 2004 divided by 5.
ACSC as share of hospital discharges is each hospital's ACSC discharges divided by its total discharges.

Age an important factor for ACSC hospitalizations, FYs 2000 - 2004

Three out of five ACSC patients were elderly



Mirroring national trends, senior citizens comprised the largest group of ACSC patients, the majority of whom were over 75.

Children under the age of five accounted for most pediatric ACSC volume and 11 percent of all ACSC patients.

Working age adults (18-64) were nearly two-thirds of Connecticut's population but less than one-third of ACSC discharges.

The elderly had highest incidence of ACSC hospitalizations, FY 2004

	Age groups (rates per 100,000 people)			
ACSC Conditions	0-17	18-39	40-64	65+
Adult Asthma	-	76.4	115.0	187.2
Angina	-	2.2	33.1	93.3
Bacterial Pneumonia	115.7	57.3	214.2	1735.1
Chronic Obstructive Pulmonary Disease	-	3.3	95.3	722.8
Congestive Heart Failure	-	14.0	162.5	1909.1
Dehydration	99.9	19.8	61.8	513.3
Diabetes Long Term Complication	-	20.3	101.8	296.8
Diabetes Short Term Complication	-	46.3	41.8	36.3
Diabetes Uncontrolled	-	3.0	7.7	15.9
Hypertension	-	5.8	25.7	62.0
Low Birth Weight[1]	6.6	-	-	-
Lower Extremity Amputation	-	2.9	34.7	120.9
Pediatric Asthma	168.8	-	-	-
Pediatric Gastroenteritis	58.3	-	-	-
Perforated Appendix[1]	19.2	16.6	32.8	49.6
Urinary Tract Infection	46.7	49.4	59.5	572.1

[1]Low birth weight rate per 100 births and perforated appendix per 100 appendicitis discharges.

A demographic profile of all CT ACSC discharges, FYs 2000 - 2004

The two largest subgroups of ACSC discharges were the oldest, white Medicare recipients and those slightly younger, typically hospitalized for congestive heart failure, bacterial pneumonia or chronic obstructive pulmonary disease. These two subgroups accounted for nearly half of all ACSC discharges (first two table rows).

Although Hispanics were only eight percent of all ACSC discharges, Hispanic children receiving HUSKY constituted one of the larger ACSC subgroups. This group was largely composed of low birth weight babies and children with asthma.

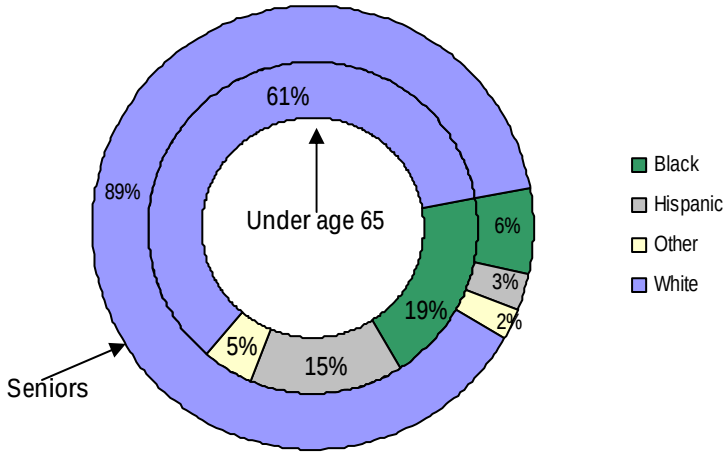
Age	Race	Payer	Principal ACSCs	Share of all ACSC discharges (%)
75+	White	Medicare	CHF, BP, COPD	37
65-74	White	Medicare	CHF, BP, COPD	12
45-64	White	Private	CHF, BP, COPD	8
0-17	White	Private	Low birth weight, Dehydration	6
45-64	White	Medicare	CHF, BP, COPD	3
18-44	White	Private	BP, Asthma, Perforated Appendix, UTI	3
0-17	Hispanic	Medicaid	Low birth weight, asthma	2
75+	Black	Medicare	CHF, BP, COPD	2
45-64	White	Medicaid	BP, COPD, Asthma, Diabetes (long term)	2
0-17	White	Medicaid	Low birth weight, asthma	2
All Others				23
Total				100%

This chart presents a demographic and primary payer breakdown of ACSC discharges, with each row identifying a subgroup. For example, the first row shows that 37 percent of ACSC discharges were 75 years or older, white, Medicare recipients whose most commonly had either congestive heart failure (CHF), bacterial pneumonia (BP) or chronic obstructive pulmonary disease (COPD).

ACSC abbreviations: “BP” Bacterial pneumonia, “CHF” Congestive heart failure, “COPD” chronic obstructive pulmonary disease, and “UTI” urinary tract infection.

While elderly were largest share of ACSC, growth was driven by younger minorities

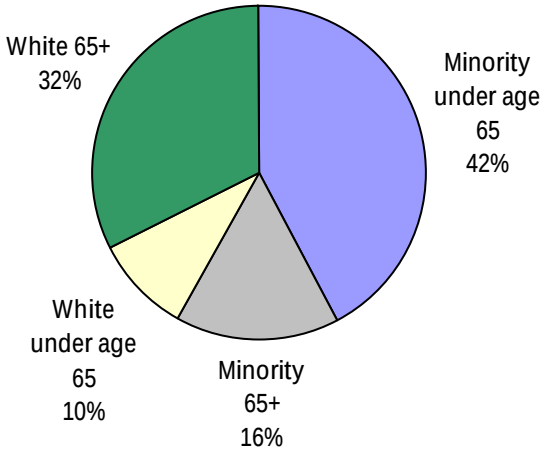
ACSC patient race varied by age, FYs 2000 - 2004



Among younger ACSC patients, minorities were overrepresented compared to their share of the state's population: blacks (19 percent versus 9 percent) and Hispanics (15 percent versus 10 percent).

For all ACSC patients combined and those age 65+, race closely approximated Connecticut's general population.

Minorities drove growth in patient volume (share of total growth), FYs 2000 - 2004



From FY 2000 through FY 2004, minorities accounted for more than half of the total growth in ACSC discharges. Much of this increase was in those under 65 years.

Minorities account for two-thirds of Medicaid ACSC hospitalizations, revealing a relationship between race and payer. Among minorities, Medicaid recipients were the fastest growing segment of ACSC patients.

Notably, the number of Hispanic ACSC hospitalizations grew by one-third.

Minorities had higher ACSC inpatient incidence, FY 2004

Compared with all races combined, Blacks had higher rates for 11 of the 16 ACSCs, meaning they were more likely to be hospitalized for these conditions. Blacks had rates twice as high or greater than all races combined for adult and pediatric asthma, all diabetes conditions, hypertension and lower extremity amputations. They also had the highest incidence of congestive heart failure (one third higher).

Hispanics had higher rates than all races combined for half of all ACSCs. Their rates for adult and pediatric asthma were about twice as large as those for all races combined. Hispanics had higher than average incidence of all forms of diabetes, along with low birth weight babies and pediatric gastroenteritis.

Whites had higher than average ACSC disease incidence for 7 of the 16 ACSCs, principally diseases more prevalent among the elderly: angina, bacterial pneumonia, congestive heart failure, COPD, dehydration and urinary tract infections.

	Rate per 100,000 people				
ACSC Conditions	Black	Hispanic	Other	White	All Races
Adult Asthma[1]	264.5	261.0	75.1	82.7	113.3
Angina[1]	28.3	17.7	25.7	34.5	32.2
Bacterial Pneumonia[2]	285.8	239.0	206.1	381.8	351.3
Chronic Obstructive Pulmonary Disease[1]	97.6	60.8	54.4	198.1	172.2
Congestive Heart Failure[1]	550.6	261.0	205.6	430.1	416.9
Dehydration[2]	112.4	86.1	90.8	126.8	119.9
Diabetes Long Term Complication[1]	263.2	118.6	70.2	89.4	105.8
Diabetes Short Term Complication[1]	143.5	71.2	20.8	29.6	42.5
Diabetes Uncontrolled[1]	26.1	12.1	5.9	5.0	7.4
Hypertension[1]	89.1	21.6	23.7	18.2	24.7
Low Birth Weight[4]	11.1	7.4	5.8	5.8	6.6
Lower Extremity Amputation[1]	83.2	44.4	23.7	33.2	38.0
Pediatric Asthma[3]	389.1	304.0	205.0	100.8	168.8
Pediatric Gastroenteritis[3]	65.0	94.1	66.1	49.1	58.3
Perforated Appendix[4]	25.8	22.2	21.8	25.1	24.6
Urinary Tract Infection[2]	113.0	100.9	85.3	128.9	122.8

Green numbers indicate rates above state average for all races combined (shown in last column).

Rate (per 100,000 people): Rate calculation according to AHRQ guidelines. For each ACSC, the number of hospital discharges was divided by the appropriate population figure and then multiplied by 100,000. For example, there were nearly 265 hospitals admissions for adult asthma for every 100,000 black Connecticut adults. This table reports "observed rates" based upon race which have not been risk adjusted or smoothed and therefore may be slightly different from those in the table on page 3.

ACSC populations:

[1]Adults - age 18 and older

[2]All Connecticut residents

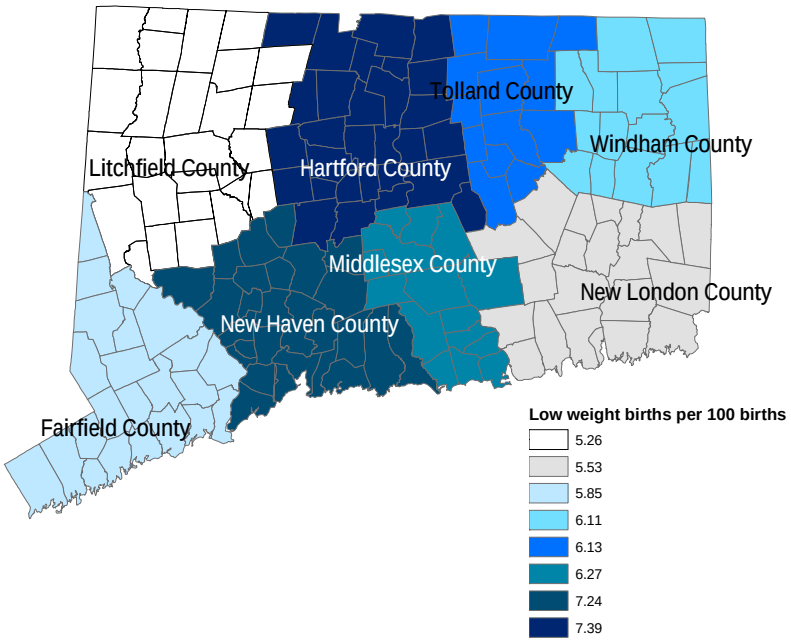
[3]Children - under the age of 18

[4]Condition specific rates – populations were all births and those who had appendicitis. Low birth weight was included as a "preventable hospitalization" because regular prenatal care and certain maternal behaviors have been shown to reduce the incidence of low birth weight babies. Similarly, prompt care will limit the incidence of an appendix becoming perforated. These rates are per 100 births and 100 appendicitis discharges.

"Whites," "Blacks" and "Others" are all non-Hispanic.

ACSC rates varied by county

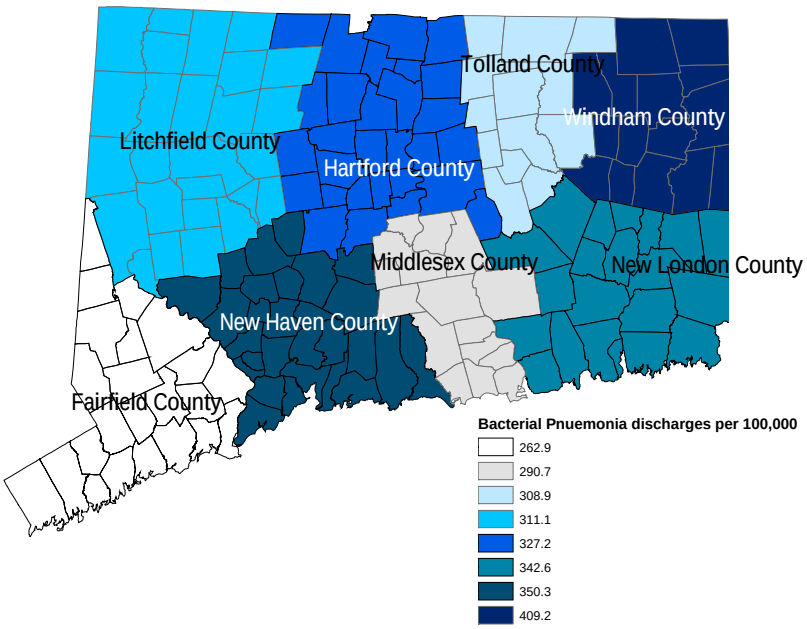
Hartford County had the highest incidence of low weight births, FY 2004



Connecticut had a higher incidence of low birth weight babies than the U.S. Within the state, Hartford County had the highest rate of low birth weight babies, and Middlesex, New Haven, Tolland and Windham Counties' rates were also higher than the national rate.[8]

New Haven County had the second highest rate of low birth weight babies. For all ACSCs, its rates were higher than statewide rates, and for nine of these sixteen conditions it had the highest county rate in Connecticut.

Bacterial pneumonia hospitalizations most common in Windham County, FY 2004

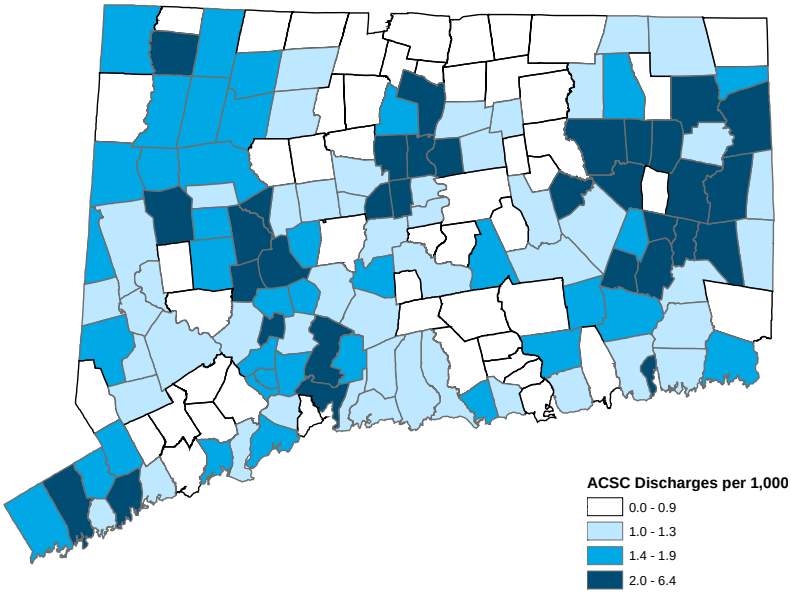


Bacterial pneumonia was one of five ACSC conditions for which Windham County had the highest rate of hospitalization in Connecticut. Windham's hospitalization rates for 11 of the 16 ACSC conditions were higher than statewide rates.[9]

Counties with few ACSC rates higher than those for the state included Middlesex (1), Fairfield and Litchfield (2) and Tolland (5). New London County rates were higher for half of the ACSC conditions, but none of these rates were not the state's highest county rates.

Higher town ACSC hospitalization rates related to lower median household income and larger minority population

Average incidence of pediatric ACSC discharges, FYs 2000 - 2004 (Ages 0 - 17)

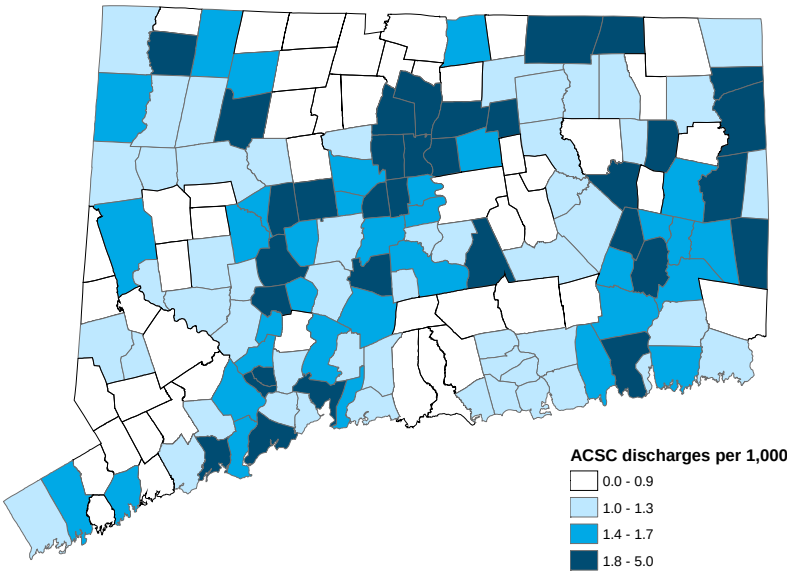


Windham County towns, and the greater Norwich, Hartford, Waterbury, New Haven and Stamford-Norwalk areas had the highest incidence of pediatric ACSC discharges.[10]

Although those towns had a higher than average share of children, the strongest factors correlated with town ACSC rates were median household income and minority share of population.[11]

Towns of northern Hartford County, northern Fairfield County, and Middlesex County had the lowest incidence of pediatric ACSC discharges.

Average incidence of adult ACSC discharges, FYs 2000 - 2004 (Ages 18+)



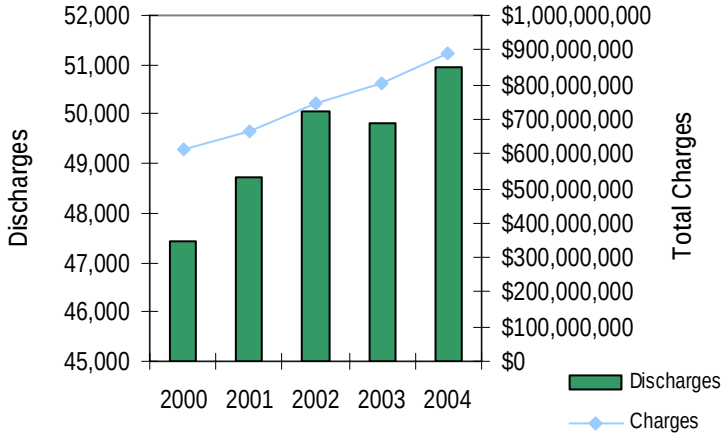
Adult ACSC discharges were most prevalent in the greater Norwich, Hartford and Waterbury areas, northern Litchfield County, and the cities of Bridgeport, New Haven, and Windham.[12] *The greater Norwich and Waterbury areas and northern Litchfield County all had higher proportions of senior citizens as a share or their total population.*[15]

The lowest per capita adult ACSC hospital rates were for the towns in Fairfield, Middlesex and northern Hartford counties.

Summary

Over the last five years, the number of "preventable hospitalizations" in Connecticut increased. By fiscal year (FY) 2004, there were over 50,000 ACSC hospitalizations with nearly 300,000 total patient days and associated total charges of almost $900 million. While Connecticut compares favorably to the U.S. with a lower incidence of preventable hospitalizations, there were age, race and geographic disparities within the state. Addressing these disparities and the cost of preventable hospitalizations are challenges faced by local and statewide authorities and providers. By using AHRQ quality indicators, OHCA will continue to assist these local and regional health planning authorities by disseminating area-specific ACSC hospitalization data.

Increasing ACSC discharges and patients, FYs 2000—2004



OHCA's examination of preventable hospitalizations revealed that:

- From FY 2000 through 2004, ACSC hospitalizations accounted for 13 percent of all inpatient discharges and total hospital charges and 15 percent of total patient days.
- ACSC patients had longer average hospital stays than other patients.
- During this period, the number of ACSC discharges (7 percent), patient days (4 percent), and their associated total charges (46 percent) grew steadily.
- Connecticut compared favorably with national ACSC rates, with a lower prevalence of preventable hospitalizations for 15 of the 16 conditions. The incidence of low birth weight babies was the exception, with the state's rate slightly above the U.S. (6.8 versus 6.0 per 100 births).
- ACSC patients tended to require extensive health care resources: Nearly two-thirds had been previously hospitalized, most were admitted through the Emergency Department (80 percent), and nearly half received additional care after discharge (25 percent transferred to another facility and 20 percent to home health services).
- While the majority of ACSC hospitalizations were elderly Medicare patients, much of the ACSC growth was among younger patients, particularly those covered by Medicaid.
- Blacks and Hispanics were more likely than non-Hispanic whites to be hospitalized for ACSCs.

For technical questions regarding OHCA's Preventable Hospitalizations Study or data requests including figures for municipalities/local areas please contact Michael Sabados at (860) 418-7069 or michael.sabados@po.state.ct.us.

TECHNICAL NOTES

This study implements a methodology developed by the U.S. Department of Health and Human Services Agency for Health Research and Quality (AHRQ). Its updated 2004 "Guide to Prevention Quality Indicators: Hospital Admissions for Ambulatory Care Sensitive Conditions" presents clinically based national standards for the assessment of "preventable hospitalizations." In 2001, AHRQ sponsored a group of clinicians and researchers from the University of California-San Francisco and Stanford University which reviewed the clinical literature and identified 16 Ambulatory Care Sensitive Conditions (ACSC) for which effective and timely primary care significantly reduced the likelihood of hospitalization. They conducted data analysis and validation using the 2002 Health Care Cost and Utilization Project (HCUP) State Inpatient Database (SID) which included 35 states' inpatient discharges.

Connecticut inpatient acute care hospital data for FYs 2000 through 2004 were prepared according to AHRQ specifications and AHRQ SPSS syntax files were downloaded to identify ACSC discharges. For each of the 16 ACSCs, the syntax also generated three disease incidence rates: observed (discharges per the relevant population), risk adjusted (based on race and age) and a smoothed rate in which state or area rates were shrunk toward national averages. AHRQ syntax created observed, risk-adjusted and smoothed ACSC rates for Connecticut and its eight counties, along with age, gender and racial groups.

ENDNOTES

[1]AHRQ Quality Indicators—Guide to Prevention Quality Indicators: Hospital Admission for Ambulatory Care Sensitive Conditions. Rockville, MD: Agency for Healthcare Research and Quality, 2001. Revision 4. (November 24, 2004). AHRQ Pub. No. 02-R0203.

AHRQ Quality Indicators—Prevention Quality Indicators: Software Documentation, Version 2.1—SPSS. Hospital Admission for Ambulatory Care Sensitive Conditions. Rockville, MD: Agency for Healthcare Research and Quality. Revision 4. (November 24, 2004). AHRQ Pub. No. 02-R0207.

[2]A number of factors influence the hospitalization of an individual, including overall health; therefore his or her hospitalization for an ACSC may not have truly been "preventable."

[3]Primary payer's share of all non-ACSC discharges: Medicare/other federal (60%), Medicaid (14%), Private (24%), and Uninsured (2%).

[4]Uninsured included payer categories self-pay, no charge and other.

[5]Prior admission for an ACSC patient does not necessarily mean the previous hospitalization was for the same condition.

[6]Blue Cross Blue Shield, "Improving Access to the Emergency Department: Costs, Trends and Solutions," 2004.

The high volume of maternity patients reduces the share of non-ACSC adults admitted to the hospital from the ED.

[7]Blue Cross Blue Shield cited above.

[8]Rates are risk adjusted by age and sex and smoothed (i.e., shrunk toward national means). Comparison of Connecticut county and national rates were for FY 2002, the most recent year of available national data.

[9]Rates are risk adjusted by age and sex and smoothed (i.e., shrunk toward national means).

[10]Rates are age adjusted according to the distribution of Connecticut's 2000 Census data. Age categories: under age five, five to 14 and 15 to 17. Age is often a factor with illness and age adjusted rates account for age disparities among towns. Each map legend category includes approximately 25 percent of all towns (quartiles).

[11]Many towns with the highest share of children had low to moderate ACSC rates (e.g., Weston, Darien, New Canaan, Wilton). Correlation between share of town under 18 years and ACSC hospitalization rate was non-significant. Median household income and minorities as a share of total population were significant at the .001 level. AHRQ reported that nationally, ACSC rates have been shown to be related to socio-economic status, and often, race. Various studies also showed links between the number of general practitioners or inpatient beds per capita, having a regular source of care, continuity of care and clinical factors (for Medicare recipients) — see AHRQ Quality Indicators — Guide to Prevention Quality Indicators: Hospital Admission for Ambulatory Care Sensitive Conditions cited in Note 1.

[12]Rates are age adjusted according to the distribution of Connecticut's 2000 Census data. Age categories: 18 to 19, 20 to 24, 25 to 34, 35 to 44, 45 to 54, 55 to 64, 65 to 74, 75 to 84 and 85+. Age is often a factor with illness and age adjusted rates account for age disparities among towns. Each map legend category includes approximately 25 percent of all towns (quartiles).

[13]Share of town population over 65 and over 75 with a weak but significant (.005) correlation with town adult ACSC rates. Median household income and minority share of population with stronger significant (.001) correlation with adult ACSC rates.

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