



Hospital Discharge Data, 2004

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Potentially Avoidable Hospitalizations in Tennessee, 2004

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In health care and elsewhere, it is difficult to improve what cannot be measured. To measure the adequacy and quality of ambulatory care, researchers have recently focused on hospitalizations that can potentially be avoided.^{1,2,3} These are inpatient admissions for certain conditions, called Ambulatory Care Sensitive Conditions (ACSCs), that can be prevented when clinicians deliver timely and effective outpatient treatment to individuals who actively participate in their own care, follow a healthy life style, and engage in responsible personal behavior.⁴ Nationally, nearly five million inpatient admissions to U.S. hospitals in 2000 involved treatment for one or more of these ACSCs, resulting in a total cost of more than \$26.5 billion.⁵ High rates of hospitalizations for these conditions thus suggest resources wasted as well as opportunities for improving health system efficiency by delivering timely and effective primary care in the ambulatory setting.

This report is an analysis of Tennessee hospitalization records for potentially avoidable admissions (or hospitalizations for ACSCs) for 2004. It is an update of a previous report by the Methodist LeBonheur Center for Healthcare Economics based on hospital discharge data for 2003.⁶ A major improvement in this updated report is the use of the revised definitions of ACSCs released in 2007 by the Agency for Healthcare Research and Quality (AHRQ).⁷ This updated version of ACSC definitions as described in the AHRQ's new Prevention Quality Indicators (PQIs) has moved two pediatric conditions, pediatric asthma and pediatric gastroenteritis, to a new and separate set of quality indicators for the pediatric population. The resulting 14 PQIs for adult populations now include:

PQI No.	Prevention Quality Indicators
1.	Diabetes short-term complications
2.	Perforated appendix
3.	Diabetes long-term complications
5.	Chronic obstructive pulmonary disease
7.	Hypertension
8.	Congestive heart failure
9.	Low birth weight
10.	Dehydration
11.	Bacterial pneumonia
12.	Urinary track infection
13.	Angina admission without procedure
14.	Uncontrolled diabetes
15.	Adult asthma
16.	Low-extremity amputation among patients with diabetes

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Method: Tennessee law (Tennessee Code Annotated (TCA), Section 68-1-108) requires that every licensed hospital report all claims data found on the UB-92 Form to the Tennessee Department of Health. The Division of Health Statistics in the Office of Policy Planning and Assessment of the Department of Health has established the Hospital Discharge Data System (HDDS) to collect, compile, and disseminate patient-level discharge information since 1997.⁸ The data presented in this report contain excerpts from the 2004 HDDS dataset that covers the data period from January 1, 2004, through December 31, 2004. The study population is restricted to newborns (live births and low-birth-weight births) and adult patients (ages 18 and over) discharged from non-federal short-stay hospitals, including general medical and surgical hospitals, women's or OB/GYN hospitals, and pediatric hospitals. Excluded are patients discharged from long-term, psychiatric, rehabilitation, and other specialty hospitals. Also excluded, following the guidelines for using the AHRQ Quality Indicators, are patients who were transferred from another institution and patients discharged against medical advice.

A critical first step in the analysis of the prevalence of potentially avoidable hospitalizations involves the identification of diseases or conditions for which timely and effective primary care can prevent the need for hospitalization. Lists of preventable admissions have been determined and reported by panels of experts.¹⁻³ In the early 1990s, the Agency for Healthcare Quality (AHRQ) asked researchers from the Evidence-Based Practice Center at the University of California San Francisco and Stanford University to review the literature and use validation tests to determine a narrow set of inpatient admissions with ACSC conditions. The results of a decade-long work were reported in a 2004 AHRQ publication under the Prevention Quality Indicators Project.⁴

For this report, we used the revised ACSC definitions as reported in the March 2007 revision of the AHRQ Publication, *AHRQ Quality Indicators – Guide to Prevention Quality Indicators: Hospital Admissions for Ambulatory Sensitive Conditions* Version 3.1. This publication, together with its sister publication, *AHRQ Quality Indicators - Prevention Quality Indicators: Technical Specifications* Version 3.1, provides a comprehensive review of the origins, background, and technical specifications of the AHRQ Prevention Quality Indicators Project.

Results: In 2004, a total of 120,669 ACSC hospitalizations occurred in Tennessee (Table 1), representing about 15.5% of all inpatient discharges at acute-care hospitals across the State. The leading ACSC was congestive heart failure accounting for 28,513 or 23.6% of state total of potentially avoidable hospitalizations in 2004. This was followed by bacterial pneumonia (27,355 or 22.7% of total) and chronic obstructive pulmonary disease (16,817 or 13.9% of total). Compared to the United States, Tennesseans experienced a higher rate of potentially avoidable hospitalizations in 8 of the 14 ACSCs, with Tennessee exceeding the U.S. by a large margin in the rates of chronic obstructive pulmonary disease, bacterial pneumonia, and low birth weight. In contrast, the U.S. had higher rates in 2004 for perforated appendix, diabetes with long-term complications, angina without procedure, adult asthma, and lower-extremity amputation among patients with diabetes.

Compared to the data presented in the 2003 report, the 2004 data presented in Table 1 showed a slight decline in hospitalization rate in many of the ACSCs. These include bacterial pneumonia (475.9 vs. 520.9 per 100,000 adult population), congestive heart failure (496.0 vs. 511.4 per 100,000 adult population), chronic obstructive pulmonary disease (292.6 vs. 327.2 per 100,000 adult population), adult asthma (100.7 vs. 107.2 per 100,000

adult population), dehydration (133.6 vs. 142.0 per 100,000 adult population), and angina without procedure (30.6 vs. 37.3 per 100,000 adult population). The rates of low birth weight hospitalizations, perforated appendix, lower-extremity amputation among patients with diabetes, hypertension and uncontrolled diabetes remained virtually unchanged between 2003 and 2004. Four ACSCs showed a slight increase from 2003 to 2004 (urinary tract infection, 188.8 vs. 194.0 per 100,000 population; diabetes with short-term complications, 57.0 vs. 59.9 per 100,000 population; diabetes with long-term complications, 105.3 vs. 111.5 per 100,000 population; perforated appendix, 24.1 vs. 24.9 per 100 admissions for appendicitis).

Table 1 . Potentially Avoidable Hospitalizations in 2004, Tennessee and U.S., 2004

PQI No.	ACS Condition	No. of Discharges	Rate per 100,000 population	
			Tennessee	U.S.
1	Diabetes Short-term Complications	3,446	59.9	54.7
2	Perforated Appendix	1,158	24.9	30.2
3	Diabetes Long-term Complications	6,407	111.5	126.8
5	Chronic Obstructive Pulmonary Disease	16,817	292.6	230.4
7	Hypertension	2,946	51.2	49.7
8	Congestive Heart Failure	28,513	496.0	488.6
9	Low Birth Weight Birth	6,250	7.8	6.3
10	Dehydration	7,679	133.6	127.4
11	Bacterial Pneumonia	27,355	475.9	418.2
12	Urinary Tract Infection	11,149	194.0	177.3
13	Angina without Procedure	1,757	30.6	45.9
14	Uncontrolled Diabetes	1,401	24.4	22.2
15	Adult Asthma	5,786	100.7	120.6
16	Lower-extremity Amputation among Patients with Diabetes	5	0.1	39.1
Total		120,669	1970.5	1,878.5

1. Perforated Appendix rate calculated for each 100 at risk population defined as total appendicitis hospitalizations (4,658 in Tennessee, 2004)
2. Low Birth Weight Birth rate calculated for 100 live births (80,083 in Tennessee, 2004)
3. Total ACSC admissions include 114,419 adult cases and 6,250 low birth weight births
4. The U.S. rates downloaded from http://www.qualityindicators.ahrq.gov/downloads/pqi/pqi_comparative_v31.pdf

Female patients were responsible for 70,683 hospitalizations for ACSCs in 2004, while males were responsible for the remaining 49,986. The female and male total ACSC hospitalizations represented 15.0% and 16.2% of the respective total discharges for all conditions of the two gender groups. In 2003, the percentages of potentially avoidable hospitalizations of total discharges were 15.8% and 16.9% females and males, respectively.

Table 2. Potentially Avoidable Hospitalizations by Gender, 2004

Gender	All Discharges	ACSC Discharges	Percent ACSC of Total
Female	470,556	70,683	15.0%
Male	309,100	49,986	16.2%
Unknown	8	0	0.0%
Total	779,664	120,669	15.5%

Table 3 summarizes potentially avoidable hospitalizations by race. In 2004, Black and White Tennesseans reported 116,658 and 604,472 inpatient hospitalizations, respectively, for all conditions. Black patients appeared to have a slightly higher rate of potentially avoidable hospitalizations than White patients (16.8% vs. 15.7%), while Hispanics and other small racial groups, such as Asians, Native Americans, and Pacific Islanders, exhibited much lower rates than either the White or Black population subgroup.

Table 3. Potentially Avoidable Hospitalizations by Race, 2004

Race	All Discharges	ACSC Discharges	Percent ACSCs of Total
White	604,472	94,756	15.7%
Black	116,658	19,588	16.8%
Hispanic	14,689	1,488	10.1%
Other	18,319	2,759	15.1%
Unknown	25,526	2,078	8.1%
Total	779,664	120,669	15.5%

Table 4 reports potentially avoidable hospitalizations by major payer group. There appeared to be substantial inter-group differences in the proportion of potentially avoidable hospitalizations in 2004. Medicare led the rate of potentially avoidable hospitalizations, with 22.8% of its inpatient discharges being potentially preventable. In comparison, only 11.5% of hospitalizations paid by TennCare (Tennessee's managed-care Medicaid program) were for ACSCs while the percentage for Commercial and BlueCross BlueShield plans were only 8.5%.

Table 4. Potentially Avoidable Hospitalizations by Payer group, 2004

Payer	All Discharges	ACSC Discharges	Percent ACSCs of Total
Medicare	334,949	76,324	22.8%
TennCare	168,738	19,494	11.5%
Commercial and BC/BS	226,215	19,242	8.5%
Uninsured/Self Pay	22,510	3,012	13.4%
Other	2,314	269	11.6%
Unknown	24,939	2,328	9.3%
Total	779,664	120,669	15.5%

The Uninsured/Self Pay category includes mostly patients who reported that they had no insurance coverage at the time of admission and, therefore, can be considered as uninsured. About 13.4% of Self Insured/Self Pay patients' hospitalizations were for ACSCs. Finally, the "Other" category, which includes Champus (military) and Workers Compensation, reported a rate of hospitalizations for ACSC conditions of 11.6%, lower than the state average of about 15.5%.

Discussion. In Tennessee, potentially avoidable hospitalizations or admissions for ACSC conditions comprised 15.5% of hospitalizations for all conditions in 2004, a slight drop from the 2003 rate of 16.1%. There appeared to be a slight difference due to gender in the percentage of ACSC hospitalizations, the same can also be said about the Black and White population subgroups. Among the major insurance groups, Medicare exhibited a much higher proportion of ACSC hospitalizations than the state average because of the aged population it serves. In comparison, TennCare accounted for a proportionately smaller share of ACSCs while the other insurance groups such as commercial insurance/BCBS and uninsured/self-pay reported still lower percentages of ACSCs than the two major public-sector insurance programs.

Hospitalizations for ambulatory care sensitive conditions (ACSCs) have been referred to as potentially avoidable hospitalizations because they can be avoidable by timely delivery of effective primary care in the ambulatory setting. They are believed to be a reliable indicator of the access to and quality of the ambulatory care system that serves the general population. Thus, the higher prevalence of ACSCs in Tennessee adds urgency for improving the adequacy and quality of the primary care system that serves the general population. Similarly, the reported high rates of ACSCs among the Medicare population deserve further scrutiny by both federal authorities and state and local health care decision makers. The elimination of even a portion of these expensive hospitalizations should free substantial resources for other health care services and reduce the pressure on health care costs in a state that is struggling with many health care challenges.

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For additional Tennessee Hospital Discharge Statistics, visit the Web site of the Methodist LeBonheur Center for Healthcare Economics at: <http://healthecon.memphis.edu/>

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