Issue Brief

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Potentially Avoidable Hospitalizations in Tennessee, 2009

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THE UNIVERSITY OF MEMPHIS

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The Methodist Le Bonheur Center for Healthcare Economics

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Introduction

Tennesseans spend more on hospital care than on any other medical treatment, with hospital costs accounting for more than one-third of all dollars spent on health care in 2009.[1] In many cases, these costly hospitalizations could have been avoided. The purpose of this Issue Brief is to provide an update of the number, rates, and costs of these potentially avoidable hospitalizations in Shelby County, Tennessee, using hospital discharge data for 2009.

This Issue Brief begins with an overview of the concept of a potentially avoidable hospitalization (PAH) and its significance from a population health perspective. It then examines the observed rates of PAHs by gender, age, and race in Shelby County, Tennessee, and compares them with the expected rates. It ends with a comparison of hospital charges billed and reimbursements paid for PAHs by different major third-party payers.

This report focuses on adult patients aged 18 and over who were discharged from short-term general and critical-access hospitals in Tennessee in 2009. Of all non-maternal adult discharges reported in Tennessee inpatient discharge records, about 11 percent were for out-of-state patients, mostly from Virginia, Mississippi, and Georgia. These non-Tennessee patients are excluded from this report.

What is a Potentially Avoidable Hospitalization?

Many inpatient hospitalizations are potentially avoidable. These are hospital admissions that could have been prevented if the hospitalized patients had sought primary care earlier and been treated effectively before they became seriously ill. Importantly, a potentially avoidable hospitalization or PAH is not the same as an unnecessary hospitalization. A patient's hospitalization is unnecessary if the risks and costs significantly outweigh the expected benefits. A patient with a potentially avoidable hospitalization, in contrast, truly needs hospital care once he or she is so sick that hospitalization is the only viable option.

[1] Kaiser Family Foundation's State Health Facts project. http://www.statehealthfacts.org/comparebar.jsp?ind=262&cat=5 [Accessed 4/19/2012].

The number and rates of PAHs for a city or state can now be identified thanks primarily to research work led by the Agency for Healthcare Research and Quality (AHRQ), the lead federal agency charged with improving the quality and effectiveness of health care delivery in the U.S. Many state and local health agencies and independent researchers across the country now use a set of measures called Prevention Quality Indicators (PQIs) that can be obtained from AHRQ and applied to hospital inpatient discharge data to identify hospitalizations that are potentially avoidable.[2] The current PQIs can trace their origin to a set of software programs developed by the University of California, San Francisco–Stanford University Evidence-based Practice Center and the University of California, Davis under a contract with AHRQ.

The Significance of PAHs

According to the Centers for Disease Control and Prevention (CDC), rates of potentially preventable hospitalizations vary from community to community. Communities with poorer access to coordinated primary care tend to have higher rates of PAHs. Therefore, the prevalence and variations of PHAs have been recommended by AHRQ as a tool for state and local health authorities to assess the adequacy and effectiveness of primary care at the community level.[3]

Because hospitalizations tend to be more costly than outpatient primary care, potentially preventable hospitalizations are used often as markers of the efficiency of the health-care system. The number and cost of excess potentially preventable hospitalizations can be calculated by comparing rates for a group of individuals with an ideal rate. These estimates can help communities identify potential cost savings associated with improving primary care and reducing potentially preventable hospitalizations.

It is important to note that while PAHs suggest a lack of access to effective primary care in the outpatient setting, many other factors can also contribute to the rate of PAHs in a community. These include individuals' health status, when they seek treatment, and individuals' willingness to engage in health-promoting behaviors.

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[2] For information about the development of the PQIs, the technical specifications, and other types of AHRQ quality indicators, visit the AHRQ Website, http://www.qualityindicators.ahrq.gov.

[3] A. B. Bindman, K. Grumbach, D. Osmond, et al. (1995). Preventable hospitalizations and access to health care. *Journal of the American Medical Association*, 274:305-11.

It is important, too, to note that the terms "ambulatory care sensitive condition," "potentially avoidable hospitalization," and "prevention quality indicator" are related, but they should not be used interchangeably. An ambulatory care sensitive condition (ACSC) refers specifically to the principal diagnosis of a PAH, while PAH, by contrast, refers to the hospitalization resulting from the ACSC. Finally, a PQI is the community-wide rate of PAHs, generally measured per 100,000 people.

Types of PAHs

PAHs can occur for either a chronic or acute ambulatory care sensitive condition. Chronic ACSCs require certain preventive health services and regular maintenance visits to a primary care physician. By contrast, acute ACSCs are those not requiring ongoing management but are still sensitive to (or treatable by) primary care treatment.

Chronic ACSCs are Short- and Long-term Diabetes Complications, Hypertension, Congestive Heart Failure (CHF), Angina (if no cardiac procedure is performed), Asthma, and Chronic Obstructive Pulmonary Disease (COPD).

The Prevention Quality Indicators (PQIs) for Adult Population

PQI No.	Preventon Quality Indicator (PQI)
	Chronic
1	Short-term Diabetes Complications
3	Long-term Diabetes Complications
5	Chronic obstructive pulmonary disease (COPD)
7	Hypertension
8	Congestive Heart Failure o(CHF)
13	Angina admission without Procedure
14	Uncontrolled Diabetes
15	Adult Asthma
16	Lower-Extremity Amputation in Diabetics
	Acute
2	Perforated Appendix
10	Dehydration
11	Bacterial Pneumonia
12	Urinary Tract Infection

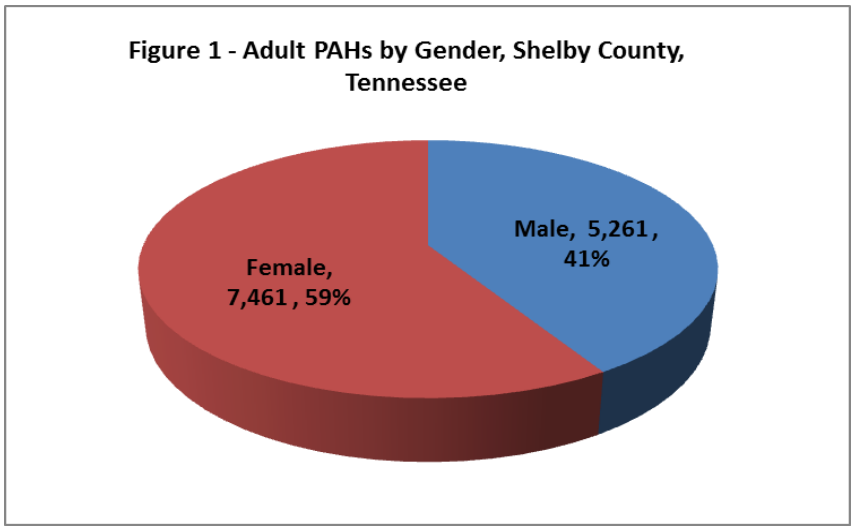
Source: The Agency for Healthcare Research and Quality. Available at http://qualityindicators.ahrq.gov/Modules/pqi_overview.aspx

Acute PQIs are measured using hospitalizations for the following ACSCs: Dehydration, Bacterial Pneumonia, Urinary Tract Infection, and Perforated Appendix. The Perforated Appendix PQI is measured differently from all of the others. It is calculated per appendicitis admission rather than at the population level. Because it has a different denominator in calculating the PAH rates, the Perforated Appendix PQI is treated separately and not included in summary rates for this report.

Findings

Total PAHs by Gender. In 2009, there were 12,722 hospitalization admissions that met the Agency for Healthcare Research and Quality's definition of a potentially avoidable hospitalization (PAH) for adults in Shelby County, Tennessee. Adult male patients accounted

for 41 percent of this total, while adult female patients accounted for the remaining 59 percent (Figure 1). With men representing 48 percent of Shelby County's general population and females the other 52 percent according to the latest Census data available,[4] female Shelby County residents seem to be more likely than male residents to be hospitalized for a potentially avoidable condition.



Potentially Avoidable Hospitalizations by Race/Ethnicity and Chronic vs. Acute Breakdown.

Table 1 shows both the number of PAHs and the rates per 100,000 adults in the general population for each of the different major racial/ethnic groups and for acute and chronic conditions in Shelby County, Tennessee. The acute PAHs include Perforated Appendix, Dehydration, Bacterial Pneumonia, and Urinary Tract Infection. The chronic PAHs include Short-term Diabetes Complications, Long-term Diabetes Complications, COPD and Asthma in Older Adults, Hypertension, Congestive Heart Failure (CHF), Angina without a Procedure, Uncontrolled Diabetes, Asthma in Younger Adults, and Lower-Extremity Amputation in Diabetics.

[4] U.S. Census Bureau, State and County QuickFacts. Retrieved April 25, 2012, from: http://quickfacts.census.gov/qfd/states/47000.html.

Table 1 - Adult Potential Avoidable Hospitalizations by Race in Shelby County, Tennessee [1]

Hospitalizations (PAHs)	Black	White	Hispanic	Other[2]	All Races
	Number of PAHs				
Acute	2,061	1,931	45	233	4,270
Chronic	5,526	2,355	35	539	8,455
Overall	7,587	4,286	80	772	12,725
	County Rate Per 100,000 Population[3]				
Acute	630	656	168		638
Chronic	1,689	800	130		1,262
Overall	2,319	1,456	298		1,900

[1]Tennessee Hospital Discharge Data for 2009

[2]The Other category includes Asians, American Indians, and other racial groups.

[3]The population size of the "Other" racial category is too small to calculate the population rate

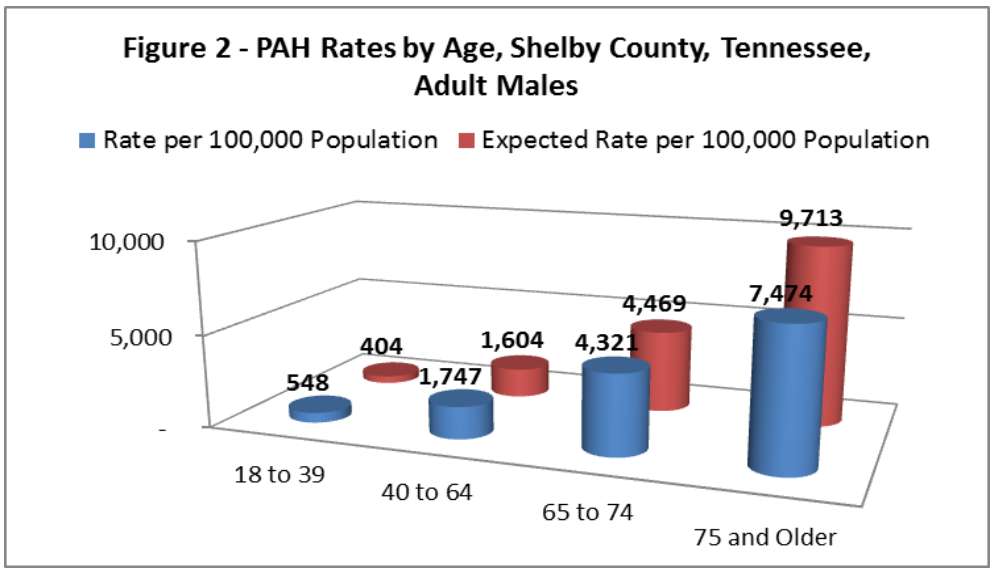
Racially, Shelby County's population is about 52.1 percent black and 40.6 percent white according to the US Bureau of the Census. But, the observed number of PAHs presented in the upper panel of Table 1 show that black patients accounted for 59.6 percent of the total PAHS (7,587 out of 12,725), while white patients accounted for 33.7 percent of the total (4,286 out of 12,725). This comparison suggests that black residents in Shelby County had more than their share of the total PAHs in 2009, while white residents had less than their share. Hispanics represent 5.6 percent of the total Shelby County population, but they were only 0.6 percent of the total PAHs (80 out of 12,725) in 2009.

Another way to understand the relative shares of the incidence of PAHs is to examine the rates of PAHs per 100,000 population. The lower panel of Table 1 shows these rates, and they tell a similar story. Notice that the population rate for the "Other" racial category was not calculated because they include many smaller sub-racial and ethnic groups that are too small, individually, to be calculated reliably.

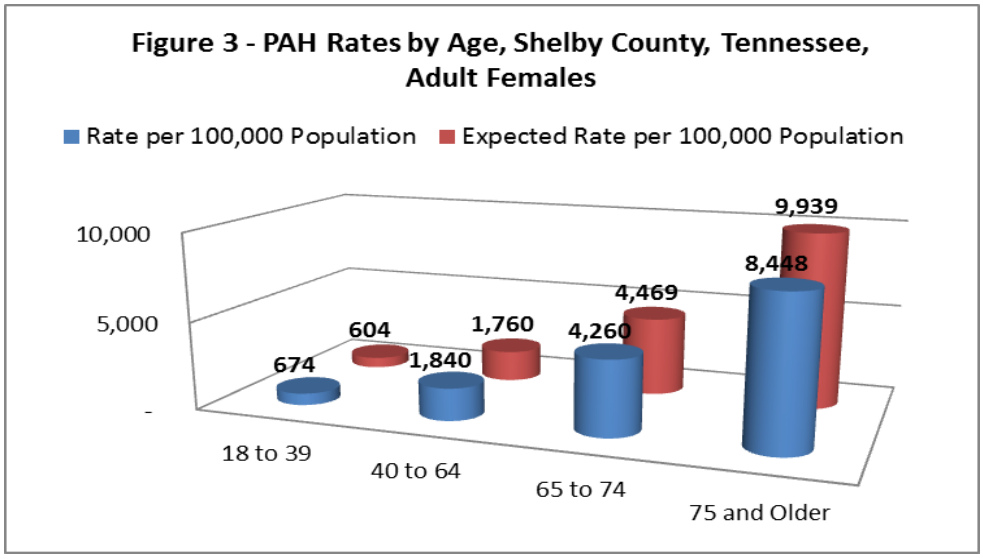
Table 1 also shows that a majority of the total PAHs (8,455 out of 12,712 or 66 percent) were for a chronic condition, while those for an acute condition accounted for the remaining 34 percent (4,270 out of 12,725) of the total PAHs in Shelby County, Tennessee. The data suggest another racial difference in PAHs--black Shelby County residents are more likely to be relatively over-represented in chronic PAHs, while white residents are more likely to be relatively over-represented in acute PAHs.

Observed and Expected PAH Rates by Age. Figures 2 and 3 present Shelby County's observed and expected rates of PAHs per 100,000 population for adult males and females, respectively, in 2009. The expected rates are the rates that Shelby County would have if this Tennessee's most populous county had the same case mix (e.g., age, gender, and poverty status) as the rest of the nation. They are calculated using a computer algorithm designed by AHRQ.[5]

For adult male Shelby County residents, the observed rates are higher than expected for young adults aged 18 to 39 and adults aged 40 to 64, but the reverse is true for older adults aged 65 to 74 and those aged 75 and higher (Figure 2). A similar pattern of PAHs is seen for adult females in Shelby County, Tennessee. The lower-than-expected observed rates for the 65-and-older population and the implied above-average performance are reassuring because older adults have higher hospitalization rates and the lower-than-expected PAH rates suggest substantial savings in hospital costs.



[5] The AHRQ PQI software, Version 4.3.



Hospital Charges and Reimbursements. In 2009, hospitals in Shelby County, Tennessee, billed insurance companies, health plans, and patients a total of $372.4 million for 12,725 cases of PAHs. The average bill was $29,254 per discharge, with chronic PAHs costing slightly more than acute ones. Hospitals typically receive a fraction of the charges billed, and in 2009, Shelby County hospitals were paid a total of approximately $88.2 million to defray the costs of PAHs. The average amount paid per PAH was almost $7,000.

Table 2 - Hospital Charges and Reimbursements Associated with Adult PAHs in Shelby County, Tennessee [1]

Potentially Avoidable Hospitalizations (PAHs)	No. of Discharges	Avg. Hospital Charges	Avg. Amount Reimbursed	Total Hospital Charges	Total Reimbursement
Acute[2]	4,270	$27,732	$6,561	$118,416,568	$28,015,251
Chronic[3]	8,455	$30,039	$7,114	$253,976,703	$60,150,770
Overall	12,725	$29,254	$6,926	$372,393,271	$88,166,021

[1]Tennessee Hospital Discharge Data for 2009, with hospital charges and reimbursements expressed in 2011 dollars.

[2]Acute PAHs include Perforated Appendix, Dehydration, Bacterial Pneumonia, and Urinary Tract Infection.

[3]Chronic PAHs include Short-term Diabetes Complications, Long-term Diabetes Complications, COPD and Asthma in Older Adults, Hypertension, CHF, Angina w/o Procedure, Uncontrolled Diabetes, Asthma in Younger Adults, Lower-Extremity Amputation in Diabetics.

Hospital Charges and Reimbursements by Individual PAH. Of the ten individual PAHs reported in Table 3, CHF was the most numerous (3,334 cases), followed by Diabetes (2,144 cases), COPD and Asthma in Older Adults (1,969), and Bacterial Pneumonia (1,928). In dollar terms, PAHs for

Diabetes were the most expensive on average, while Perforated Appendix and Asthma in Younger Adults were the least expensive. But in terms of total dollars spent, CHF cost the most, followed by Diabetes and Bacterial Pneumonia.

Table 3 - Hospital Charges and Reimbursement by Individual PAH[1]

Potentially Avoidable Hospitalizations (PAHs)	No. of Discharges	Avg. Hospital Charges	Avg. Amount Reimbursed	Total Hospital Charges	Total Reimbursement
Acute					
Perforated Appendix	156	$16,376	$12,846	$2,554,608	$2,004,041
Dehydration	1,016	$24,054	$5,765	$24,439,153	$5,857,566
Bacterial Pneumonia	1,928	$33,343	$7,907	$64,284,555	$15,244,403
Urinary Tract Infection	1,326	$22,393	$5,230	$29,692,864	$6,935,514
Chronic					
All Diabetes	2,144	$35,895	$8,633	$76,959,428	$18,509,387
COPD and Asthma in Older Adults	1,969	$28,066	$6,715	$55,262,325	$13,221,518
Asthma in Younger Adults	201	$15,144	$3,069	$3,044,025	$616,888
Hypertension	725	$22,977	$5,140	$16,658,586	$3,726,429
CHF	3,334	$30,005	$7,097	$100,037,751	$23,661,631
Angina w/o Procedure	84	$25,830	$5,508	$2,169,756	$462,660

[1]Tennessee Hospital Discharge Data for 2009, with hospital charges and reimbursements expressed in 2011 dollars.

Hospital Charges and Reimbursements by Third-Party Payers. Among the different third-party payers shown in Table 4, Medicare paid by far the largest share (56.0 percent) of the total number of PAHs in 2009 in Shelby County, Tennessee. Commercial payers and TennCare reimbursed 17.2 percent and 13.4 percent of the total cases, respectively, while uninsured patients accounted for 11.7 percent of the total PAHs.

Table 4 - Hospital Charges and Reimbursements by Third-Party Payer[1]

Potentially Avoidable Hospitalizations (PAHs)	No. of Discharges	Avg. Hospital Charges	Avg. Amount Reimbursed	Total Hospital Charges	Total Reimbursement
Commercial Insurance	2,182	$26,927	$9,543	$58,753,915	$20,822,655
Medicare	7,126	$30,975	$7,585	$220,725,811	$54,048,218
TennCare/Medicaid	1,711	$28,135	$4,950	$48,138,621	$8,469,208
Self Pay/Uninsured/Charity	1,492	$25,845	$2,180	$38,560,084	$3,252,972
Other	211	$28,274	$6,101	$5,965,730	$1,287,399

[1]Tennessee Hospital Discharge Data for 2009, with hospital charges and reimbursements expressed in 2011 dollars.

On a per discharge basis, Medicare PAHs were more expensive than those paid by other insurers, averaging about $30,975 of hospital charges, while uninsured patients' bills were the lowest, averaging about $25,845 per discharge in2009. In terms of total dollars reimbursed by

third-party payers, Medicare paid hospitals $54 million, followed by commercial insurers at $21 million and TennCare at $8.5 million.

It is worth noting that while Medicare and commercial insurers were responsible for 56.0 percent and 17.2 percent, respectively, of the total number of PAHs in Shelby County, Tennessee, they paid close to 62 percent and 24 percent of the total reimbursements. TennCare, in contrast, paid 9.6 percent of the total reimbursements in 2009, although they were responsible for 13.4 percent of the total number of PAH cases in Shelby County. It is also worth noting that hospitals billed uninsured patients approximately $38.6 million for their PAHs and managed to collect close to $3.3 million (8.4 percent collection rate) from those with no insurance coverage.

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This Issue Brief is a publication of The Methodist Le Bonheur Center for Healthcare Economics at the University of Memphis. The tables presented were based on the analysis by ACE Health Systems Research Consultants, LLC. The views expressed in this Issue Brief are those of the authors and do not necessarily reflect those of Methodist Le Bonheur Healthcare, Inc., or the University of Memphis.

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