The Burdens of Uninsured Hospitalizations in an Urban County

CONTEXT. Few data at the level of local health jurisdictions are available to characterize health problems specific to persons without health insurance.

PRACTICE PATTERN EXAMINED. Hospitalization patterns of residents of DeKalb County, Georgia, who have no health insurance.

DATA SOURCE. 1996 Georgia hospital discharge records for persons living within ZIP code areas included in or overlapping with DeKalb County.

RESULTS. Of 67,156 hospital discharges, 6781 (10%) were for uninsured patients. Sixty-eight percent of uninsured hospitalizations took place in publicly owned and controlled hospitals, where uninsured persons represented 45% of all discharges. Charges associated with uninsured hospitalizations amounted to $51.3 million in 1996, of which $35.3 million (69%) was claimed by public hospitals. The uninsured were overrepresented in many diagnostic groups, including diabetes, injury and poisoning, chronic liver disease, skin disease, and infectious or parasitic disease.

CONCLUSIONS. In DeKalb County, Georgia, the burden of uninsured hospitalizations falls disproportionately on the public sector. Policy initiatives are needed to more equitably share the burden of uninsured hospitalization with for-profit hospitals. Because the uninsured were overrepresented in several conditions, public health initiatives aimed at preventing these conditions should also be a priority.

In 1996, an estimated 41.7 million persons in the United States (17% of all persons < 65 years of age) had no health insurance.[1] Lack of health insurance is associated with reduced access to care, reduced service utilization,[2–4] and increased rates of hospitalization for conditions that may be preventable by adequate ambulatory care.[5]

Data on persons without health insurance are most commonly derived from national surveys such as the Current Population Survey,[1, 6, 7] the Behavioral Risk Factor Surveillance System,[8] the Survey of Income and Program Participation, [9] or the National Medical Expenditure Survey.[10] These surveys offer valuable information on persons without health insurance at the national and state levels. At the substate level, however, sample sizes are insufficient to allow proper inference. As the U.S. health care system changes rapidly, so do traditional sources of care for the indigent (i.e., the "safety net").[11] Local health departments and other publicly funded units that provide personal health services are an important component of this safety net.

Understanding the patterns of hospitalization, demographic characteristics, and health needs of persons without health insurance is essential for resource allocation and advocacy in local health jurisdictions. DeKalb County, in metropolitan Atlanta, is the second most populous county in Georgia. A diverse and rapidly growing population characterizes the county. Estimates indicate that 19% (111,250 persons) of its population lacked health insurance during 1996, a percentage similar to the 18% reported in Georgia (communicated by the Georgia Hospital Association).

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PATRICK L.F. ZUBER, MD, MPH
DeKalb County Board of Health
Decatur, Ga

Centers for Disease Control and Prevention
Atlanta, Ga

TIMOTHY A. DIGNAM, MPH
Division of Public Health
Atlanta, Ga

M. BLAKE CALDWELL, MD, MPH
Centers for Disease Control and Prevention
Atlanta, Ga

PAUL J. WEISNER, MD
DeKalb County Board of Health
Decatur, Ga

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We analyzed Georgia hospital discharge data to determine in which hospital systems uninsured residents are admitted, to quantify the financial charges associated with these hospitalizations, and to characterize the most frequent health problems that bring persons without health insurance to hospitals.

Methods

Data

We used the Georgia Department of Human Resources 1996 hospital discharge data set.[12] We included every discharge record from this data set in which the ZIP code area of residence was included in or overlapped with DeKalb County. As a result, the population studied is approximately 18% larger than that of DeKalb County proper, because residents of all the ZIP code areas that contain a portion of the county were included in the analysis. We treated every discharge record as an individual observation and did not attempt to adjust for rehospitalization.

Because our study area was not confined to county limits, we could not use county statistics to obtain the denominator data needed for the hospitalization rates in **Table 1**. Instead, we obtained age- and sex-stratified population data by ZIP code area from the 1997 Claritas Demographic Update (corresponding to population estimates for mid-year 1996). Claritas Demographic Updates use 1990 U.S. census survey information that is adjusted in a multistep and multisource process. Data are available for several geographic units, including states, counties, and ZIP code areas.[13] We approximated the number of persons belonging to each insurance status category by multiplying our study area population with proportions communicated by the Georgia Hospital Association for DeKalb County in 1996.

Insurance Status

We classified patients as "uninsured" if the payer category on their discharge record was "self-pay," "medically indigent/free," or "other." For persons labeled as "other" in the data set, the payer category had not been determined at the time of discharge. For these persons, hospital administration may seek retroactive reimbursement through the Georgia Medicaid system. However, the more restrictive Medicaid eligibility criteria in Georgia[14] for persons 1 year of age or older (outside pregnancy) only rarely allow retroactive reimbursement for cases other than newborn and pregnancy-related conditions. By grouping "others" with uninsured, therefore, we overestimate the uninsured only in these two categories. We compared uninsured hospital discharges to all hospital discharges that include the following additional categories: "Medicaid," "Medicare," "Blue Cross," "Commercial Insurance," "County or State," "Federal Champus," "Division of Public Health," "Workman's Compensation," and "HMO-PPO" [preferred provider organization].

Discharge Diagnosis

To analyze morbidity we grouped International Classification of Diseases, 9th Revision, Clinical Modification–coded primary diagnoses into 36 code

TABLE 1

Population Estimates and Hospital Discharges in the Study Area in 1996*

VARIABLE	ESTIMATED POPULATION (*n* = 688,397)	HOSPITAL DISCHARGE (*n* = 67,156)	HOSPITAL DISCHARGE RATE (DISCHARGES PER 1000 POPULATION)
Sex			
Female	51%	61%	116
Male	49%	39%	78
Age			
0–5 yr	8%	18%	213
6–17 yr	15%	4%	23
18–34 yr	28%	22%	78
35–64 yr	39%	31%	76
≥65 yr	9%	26%	263
Health insurance status			
Uninsured	19%	10%	52
Insured	81%	90%	108

**ZIP code areas included in or overlapping with DeKalb County, Georgia.*

groups proposed by the National Association of County and City Health Officials.[15] For each of these groups, we determined the proportion of uninsured persons.

Hospital Ownership

We classified hospitals according to their ownership and control by using a scheme from the Georgia State Health Planning Agency. Ownership relates to the physical facilities. According to the Georgia State Health Planning Agency definition, control is vested in the organization that has primary responsibility for policies and financial operations. Control defines the actual operator of the hospital (e.g., the lessee), which can be different from the owner. For example, a publicly owned and nonprofit organization–controlled hospital could be an institution located in public buildings but run by a nonprofit organization that leases the facility. To simplify the presentation, we defined public hospitals as those facilities that were both owned and operated by the public sector.

Hospital Charges

Hospitalization-related charges (referred to as "charges" for the remainder of this article) correspond to all charges for services rendered during the length of stay for patient care at the facility, based on the hospital's full established rate. In this analysis, we could not adjust the charges by severity of disease or any other factor likely to influence the amount or cost of medical care.

Analysis

We determined the proportion of the hospitalizations of DeKalb County residents that were uninsured, the proportion of uninsured hospitalizations in public hospitals, and the total charges for these hospitalizations. We also determined which medical conditions accounted for most of the uninsured hospitalizations, identified those diagnoses for which the uninsured were disproportionately hospitalized, and the 10 most costly diagnoses among the uninsured.

Results

As shown in **Table 1**, 688,397 persons were estimated to reside in our study area in 1996 (white persons, 54%; black persons, 42%; Asian persons, 4%). A total of 67,364 persons were discharged from Georgia hospitals (a rate of 97.9 hospitalizations per 1000 population). Of those, 67,156 (99.7%) had complete information for all the variables used in our analysis and were retained for subsequent analysis. Female patients accounted for 61%

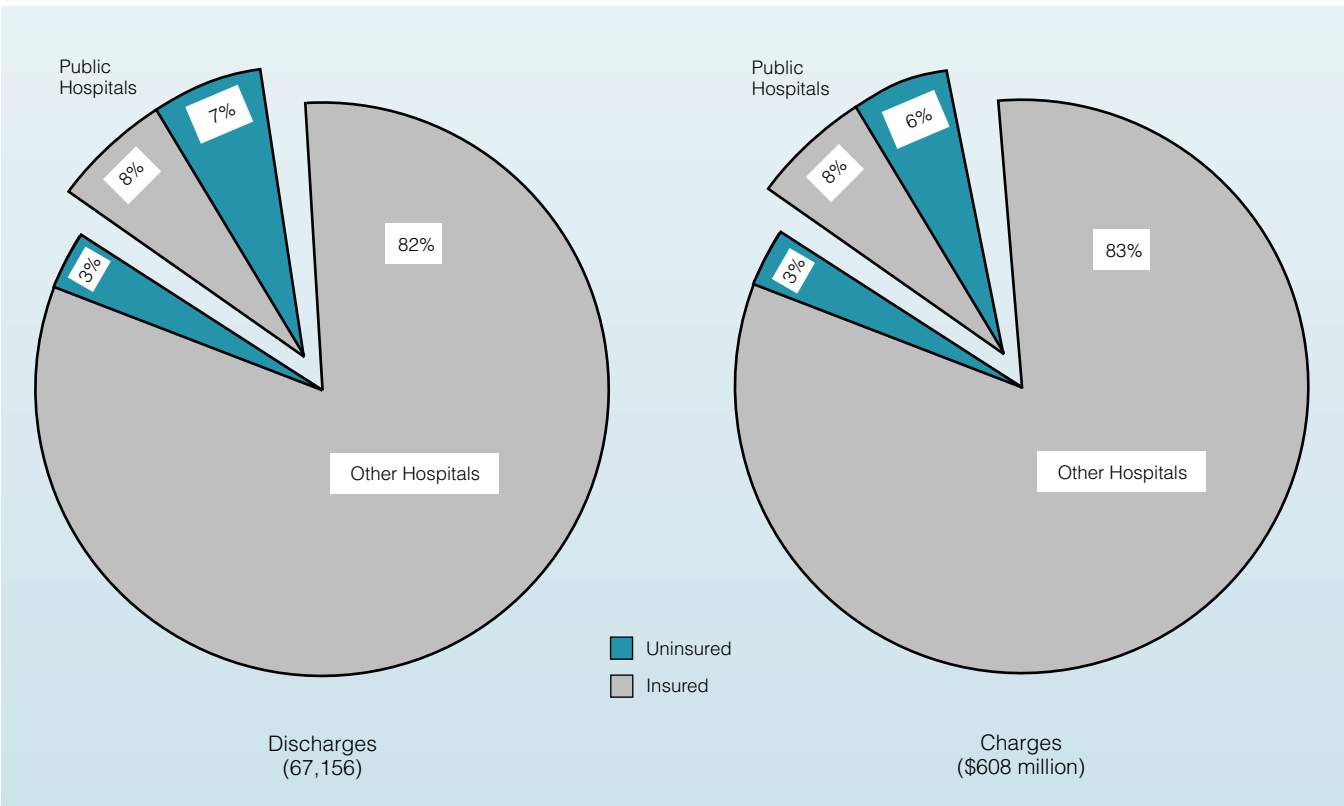

FIGURE 1. Distribution of hospital discharges and charges in public and other hospitals by insurance status for residents of DeKalb County, Georgia, in 1996.

TABLE 2

Diagnoses Accounting for More Than 100 Discharges among Uninsured Residents of DeKalb County, Georgia, in 1996*

ICD-9-CM CODE GROUP	HOSPITALIZATIONS, *n*		PROPORTION UNINSURED
	UNINSURED	TOTAL	
Pregnancy and childbirth (630–676)	1000	11,611	9%
Injury or poisoning (800–999)	976	5137	19%
Genitourinary diseases (580–629)	299	2832	11%
Conditions related to the digestive tract (520–569)	283	3296	9%
Infectious or parasitic diseases (001–041, 045–139)	274	1847	15%
Ischemic heart disease (410–414)	219	3158	7%
Mental disorders (290–319)	214	1810	12%
Pneumonia/influenza (480–487)	214	2068	10%
Other heart diseases (390–398, 415–429)	198	2819	7%
Other liver–pancreas disorders (570, 572–579)	174	1356	13%
Diabetes (250)	173	883	20%
Cancer (140–208)	149	2116	7%
Chronic obstructive pulmonary disease (490–496)	149	1690	9%
Skin diseases (680–709)	143	867	16%
Neoplasms, uncertain (210–239)	121	1550	8%
Nondiabetic endocrine diseases (240–246, 251–279)	110	1184	9%
Musculoskeletal and connective tissue diseases (710–739)	110	2040	5%
All other	1975	20,892	9%
All code groups	6781	67,156	10%

**ICD-9-CM= International Classification of Diseases, 9th Revision, Clinical Modification.*

(41,198) of all discharges. Ten percent of the discharges (6781) were classified as uninsured. Persons without health insurance had lower estimated discharge rates (52 per 1000 population) than persons with Medicaid, Medicare, or any type of commercial health care coverage.

Figure 1 shows how discharges and charges were distributed across hospital type. With 10,123 discharges, public hospitals accounted for 15% of all hospital discharges of DeKalb County residents in 1996. Over two thirds of the care of the uninsured took place in public hospitals. Although the uninsured represented about half the workload of public hospitals, they represented less than 5% of the workload at other hospitals. As expected, the distribution of total charges for the care of the uninsured followed the same pattern. Fourteen percent of the total $608 million charges for all hospitalizations of DeKalb County residents occurred in public hospitals. About 43% of these charges were incurred by the uninsured; in contrast, at other hospitals, only 3% of charges were incurred by uninsured patients.

Table 2 highlights the diagnoses accounting for most uninsured hospitalizations of DeKalb County residents. About 10% of all discharges were uninsured. We considered the uninsured to be overrepresented in a given diagnostic category if the proportion of uninsured discharges exceeded the overall 10% rate. **Table 3** lists those diagnoses in which the uninsured were overrepresented. Disproportionate hospitalization was greatest for diabetes, injury or poisoning, chronic liver disease, skin diseases, and infectious or parasitic diseases.

To better appreciate the burden of uninsured hospitalizations on the public, we also determined which uninsured hospitalizations were most costly (**Table 4**). Injury or poisoning, pregnancy and childbirth, infectious or parasitic diseases, conditions related to the digestive tract, and cancer were the five most costly

TABLE 3
Diagnoses in Which the Uninsured Were Overrepresented*

ICD-9-CM CODE GROUP	HOSPITALIZATIONS, *n*		RELATIVE RISK FOR ADMISSION†
	UNINSURED	TOTAL	
Diabetes (250)	173	883	1.94
Injury or poisoning (800–999)	976	5137	1.88
Chronic liver disease (571)	27	147	1.82
Skin diseases (680–709)	143	867	1.63
Infectious or parasitic diseases (001–041, 045–139)	274	1847	1.47
Other liver–pancreas disorders (570, 572–579)	174	1356	1.27
Mental disorders (290–319)	214	1810	1.17
Genitourinary diseases (580–629)	299	2832	1.05

**ICD-9-CM= International Classification of Diseases, 9th Revision, Clinical Modification.*
†*Risk for being uninsured in specific diagnostic categories relative to being uninsured in all diagnostic categories (10%).*

diagnoses among the uninsured. In each case, approximately 60% to 80% of the charges were incurred in public hospitals.

Discussion

Our findings document two important burdens associated with uninsured hospitalizations. First, most uninsured hospitalizations occurred in public hospitals serving DeKalb County residents; therefore, the cost of these hospitalizations had to be borne by taxpayers who supported these hospitals or by cost-shifting to other sources of funds. Second, among hospitalized persons, those without health insurance accounted for large numbers and proportions within specific diagnostic categories, such as injury or poisoning, infectious diseases, or diabetes.

Although public hospitals accounted for only 15% of all the hospitalizations, uninsured hospitalizations were concentrated in these facilities. About half of public hospitalizations were uninsured in our analysis, and

TABLE 4
The 10 Most Costly Diagnoses among the Uninsured*

ICD-9-CM CODE GROUP	EXPENDITURES (IN MILLIONS)		PERCENTAGE IN PUBLIC HOSPITALS
	PUBLIC HOSPITALS	ALL HOSPITALS	
Injury or poisoning (800–999)	$11.1	$13.6	82%
Pregnancy and childbirth (630–676)	$2.0	$3.1	63%
Infectious or parasitic diseases (001–041, 045–139)	$2.0	$2.5	80%
Conditions related to the digestive tract (520–569)	$1.9	$2.8	69%
Cancer (140–208)	$1.6	$2.5	66%
Ischemic heart disease (410–414)	$1.4	$2.6	58%
Genitourinary diseases (580–629)	$1.2	$1.9	61%
Other heart diseases (390–398, 415–429)	$1.2	$1.8	64%
Cerebrovascular disease (430–438)	$1.1	$2.2	48%
Pneumonia/influenza (480–487)	$1.0	$1.6	66%

**ICD-9-CM= International Classification of Diseases, 9th Revision, Clinical Modification.*

these patients were responsible for 42% of these hospital charges. In non–publicly controlled hospitals, on the other hand, only 3% of hospitalizations were uninsured. Andrulis and colleagues[16] suggested a series of strategies that public hospitals should consider to maintain their ability to provide care to uninsured persons in an evolving health care environment.

Health care providers who attend to persons without health insurance are usually referred to as the "safety net." In a changing health care market with increasing competition, traditional sources of financing for safety net providers (e.g., Medicaid funding for pregnancies) are moving away, although the number of uninsured patients served by these providers does not decrease.[11] The recent Children Health Insurance Program passed by the federal government has the potential to substantially reduce the uninsured proportion of those younger than 18 years of age.[17] For adults, approaches for possible expansion of health care coverage include voluntary subsidized health care plans, such as that offered in Minnesota[18]; expansions of Medicaid eligibility; or granting older adults permission to purchase Medicaid.[19–21] In our analysis, 69% of uninsured charges took place in hospitals supported by public funds. These hospitals, however, accounted for only 15% of all discharges in our study population. The possibility of non–public sector organizations helping shoulder some of this burden should also be explored.

Persons without health insurance are among the most vulnerable in terms of health-related outcomes. Nineteen percent of persons with injury or poisoning, 20% of those with diabetes, 16% of those with skin diseases, and 15% of those with infectious or parasitic conditions as the primary diagnosis were uninsured. This finding corroborates reports from broader areas, suggesting that persons who are uninsured or insured by Medicaid might have higher rates of hospitalization for conditions that are preventable by ambulatory care than do persons with private health insurance.[5] Our findings may help public health officials target resources toward these conditions.

Because we included discharges with payer category labeled as "other" among the uninsured, we may have overestimated the number of uninsured hospitalizations. This overestimation most likely affected the pregnancy and childbirth group. Only 9% of women with pregnancy-related conditions and newborns lacked health insurance at the time of discharge, and three quarters of them had a payer category labeled as "other." Because of expanded Medicaid eligibility criteria for pregnant women and newborns in Georgia, it can be expected that a majority of "others" would eventually be found eligible for Medicaid reimbursement, leaving a relatively small number of pregnant women and newborns without actual health care coverage. In Georgia, Medicaid eligibility is at 185% of the federal poverty level for pregnant women and infants. In 1995, 52% of all births were covered by Medicaid.[14] In addition, Georgia has adopted a series of strategies to streamline eligibility of pregnant women and children: discontinuation of assets test, presumptive eligibility, shortened application, expedited eligibility, mail-in eligibility, and newborn referral form.[22] Among other limitations of our classification of uninsured patients, it must be noted that for each hospitalization, only one payer category is allocated. For this reason, the problem of persons with incomplete health coverage cannot be addressed.[23] It has also not been possible to distinguish persons who were uninsured because they elected not to have health insurance from those who cannot buy health insurance.

This report illustrates how hospital discharge records can offer insights into the health needs of uninsured persons. As a result of managed care contracts, the ability of the traditional safety net to deliver uncompensated care has decreased.[24] In DeKalb County, additional public funding for effective population-based prevention programs directed toward health problems associated with uninsured hospitalizations (e.g., injury,[25] infectious diseases, and diabetes[26]) should be considered as a means to reduce the burden of health problems among those who do not have health care coverage.

Take-Home Points

- **With a population of almost 700,000 people, DeKalb County is the second largest county in Georgia.**
- **About 10% of hospitalizations of DeKalb County residents are uninsured.**
- **Two thirds of these uninsured hospitalizations occur in public hospitals.**
- **The uninsured represent about half the workload in public hospitals but less than 5% of that in other hospitals.**
- **Seventy percent of the financial burden of these uninsured hospitalizations—about $35 million—falls on the public sector.**

References

1. U.S. Bureau of Census. Current Population Survey, 1997, March Supplement.
2. Billings J, Teicholz N. Uninsured patients in District of Columbia hospitals. Health Aff (Millwood). 1990;9:158-65.

3. Wenneker MB, Weissman JS, Epstein AM. The association of payer with utilization of cardiac procedures in Massachusetts. JAMA. 1990;264:1255-60.
4. Asubonteng P, McCleary K, Munchus G. The uninsured in the United States: a strategic critical management review. Int J Health Plann Manag. 1995;10:99-111.
5. Weissman JS, Gatsonis C, Epstein AM. Rates of avoidable hospitalization by insurance status in Massachusetts and Maryland. JAMA. 1992;268:2388-94.
6. Rafferty M. A profile of the medically uninsured in Georgia. J Med Assoc Ga. 1989;78:693-8.
7. Holahan J, Winterbottom C, Rajan S. A shifting picture of health insurance coverage. Health Aff (Milwood). 1995;14:253-64.
8. Faulkner LA, Schauffler HH. The effect of health insurance coverage on the appropriate use of recommended clinical preventive services. Am J Prev Med. 1997;13:453-8.
9. Swartz K, Marcotte J, McBride TD. Personal characteristics and spells without health insurance. Inquiry. 1993;30:64-76.
10. Monheit AC. Underinsured Americans: a review. Annu Rev Public Health. 1994;15:461-85.
11. Lipson DJ, Naierman N. Effects of health system changes on safety-net providers. Health Aff (Milwood). 1996;15:33-48.
12. Georgia Health Care Data Reporting Manual. Atlanta: Georgia Department of Human Resources, Division of Public Health; 1997.
13. The Claritas demographic update methodology. Arlington, VA: Claritas, Inc; 1997.
14. MCH Update (September 30). State Medicaid Coverage of Pregnant Women and Children. Washington, DC: National Governors' Association; 1997.
15. Assessment Protocol for Excellence in Public Health. Washington, DC: National Association of County Health Officials; 1991:108.
16. Andrulis DP, Acuff KL, Weiss KB, Anderson RJ. Public hospitals and health care reform: choices and challenges. Am J Public Health. 1996;86:162-5.
17. Alpert JJ. Serving the medically underserved. Am J Public Health. 1998;88:347-8.
18. Call KT, Lurie N, Jonk Y, Feldman R, Finch MD. Who is still uninsured in Minnesota? Lessons from state reform efforts. JAMA. 1997;278:1191-5.
19. Davis K. Incremental coverage of the uninsured. JAMA. 1996; 276:831-2.
20. Thorpe KE. Incremental strategies for providing health insurance for the uninsured. Projected federal costs and number of newly insured. JAMA. 1997;278:329-33.
21. Diehr P, Madden CW, Cheadle A, Martin DP, Patrick DL, Skillman S. Will uninsured people volunteer for voluntary health insurance? Experience from Washington State. Am J Public Health. 1996;86:529-32.
22. MCH Update (March 15). State Medicaid coverage of pregnant women and children: winter 1996. Washington, DC: National Governor's Association; 1996.
23. Short PF, Banthin JS. New estimates of the underinsured younger than 65 years. JAMA. 1995;274:1302-6.
24. Smith BM. Trends in health care coverage and financing and their implications for policy. N Engl J Med. 1997;337:1000-3.
25. Baker SP, O'Neill B, Ginsburg MJ, Li G, eds. The Injury Fact Book. 2d ed. New York: Oxford Univ Pr; 1992.
26. Wilson BE, Sharma A. Public cost and access to primary care for hyperglycemic emergencies, Clark County, Nevada. J Community Health. 1995;20:249-56.

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Correspondence

Patrick L.F. Zuber, MD, MPH, US Embassy Ouagadougou, Department of State, Washington, DC, 20521-2440; telephone: (011 226) 30 65 09; fax: (011 226) 33 25 41; e-mail: pzuber@fasonet.bf.