

Primary Care Safety-Net Delivery Sites in the United States

A Comparison of Community Health Centers, Hospital Outpatient Departments, and Physicians' Offices

Christopher B. Forrest, MD, PhD

Ellen-Marie Whelan, PhD

IN 1994, MORE THAN 600 COMMUNITY health centers provided primary care to 7.1 million individuals nationwide,¹ increasing to 8.1 million by 1998.² This program is the federal government's primary mechanism for attempting to ensure access to primary care for populations residing in medically underserved areas. However, the Bureau of Primary Health Care (BPHC), Health Resources and Services Administration, Department of Health and Human Services, estimates that community health centers provide services for just 1 in 6 persons who lack access to a primary care practitioner.³ A patchwork of locally funded hospital outpatient departments, physicians' offices, and community clinics therefore supplies most of the safety net primary care. This local structure has led to substantial variation across communities in the composition and capacity of the primary care safety net.^{3,4}

Understanding how the mix of patients and the content of services differ by the primary care delivery site is important to decision makers who develop policy aimed at improving access to health care. Because of limitations in data sources, there have been no comprehensive national studies that compare primary care delivery among community health centers, hospital outpatient departments, and physicians' offices. The National Center for Health Statistics conducts separate annual surveys of visits to

Context The US primary care safety net is composed of a loose network of community health centers, hospital outpatient departments, and physicians' offices. National data on how the mix of patients and services differ across sites are needed.

Objective To develop and contrast national profiles of patient and service mix for primary care.

Design, Setting, and Patients Comparative analyses of 3 national surveys of primary care visits occurring in 1994: for data on physician's office visits, the National Ambulatory Medical Care Survey (NAMCS); for hospital outpatient department data, the National Hospital Ambulatory Medical Care Survey (NHAMCS); and for data on community health centers, the Bureau of Primary Health Care's 1994 Survey of Visits to Community Health Centers. A time trend analysis also was conducted using the 1998 NAMCS and NHAMCS.

Main Outcome Measures National estimates of primary care visit rates, types of patient presentation, patient case-mix, disposition of patients, and management interventions in 1994, and compared with 1998 data.

Results The US population made 1.3 primary care visits per person in 1994, which accounted for 43.5% of all ambulatory visits to physicians' offices, community health centers, and hospital outpatient departments. Primary care visits per person were 20% lower for Hispanics and 33% lower for black, non-Hispanic persons compared with white, non-Hispanic persons. Visits to community health centers were more likely to be made by ethnic minorities, patients with Medicaid or no insurance, and rural dwellers than visits made to the other delivery sites. Visits at hospital outpatient departments were made by sicker populations and were characterized by less continuity than the other delivery sites. Controlling for patient mix, visits made to hospital outpatient departments were more commonly associated with imaging studies, minor surgery, and specialty referrals than those made to physicians' offices. In 1998, the US population made an estimated 3.4 visits per person, 45.6% of which were primary care visits. National estimates of primary care visit rates and patient mix and practice pattern comparisons between hospital outpatient departments and physicians' offices were similar in 1998 and 1994.

Conclusions Expanding community health centers will likely improve access to primary care for vulnerable US populations. However, enhancing access to physicians' offices is also needed to bolster the safety net. The greater service intensity and poorer continuity for primary care visits in hospital outpatient departments that he observed raises concern about the suitability of these clinics as primary care delivery sites.

JAMA. 2000;284:2077-2083

www.jama.com

office-based practitioners⁵ and hospital outpatient departments.⁶ In 1994, the BPHC conducted the only national Survey of Visits to Community Health Centers.⁷ The objectives of this study were to use these 3 surveys to develop and con-

Author Affiliations: The Primary Care Policy Center for the Underserved, Department of Health Policy and Management, Johns Hopkins School of Public Health, Baltimore, Md.
Corresponding Author and Reprints: Christopher B. Forrest, MD, PhD, Department of Health Policy and Management, Johns Hopkins School of Public Health, 624 N Broadway, Room 689, Baltimore, MD 21205 (e-mail cforrest@jhsph.edu).

trast national profiles of patient and service mix for primary care visits made to community health centers, hospital outpatient departments, and physicians' offices. Using data from the 1998 National Center for Health Statistics surveys,^{8,9} we also assess how these profiles have changed over time.

METHODS

Data Sources

Visit data from physicians' offices were obtained from the National Ambulatory Medical Care Survey (NAMCS).⁵ This survey's target universe included visits made to nonfederally employed, office-based physicians in the United States; hospital outpatient departments were excluded. Selected physicians completed questionnaires for a systematic sample of patient visits made during 1 week.

The 1994 National Hospital Ambulatory Medical Care Survey (NHAMCS) was used for visits to hospital outpatient departments.⁶ This survey's target universe included visits made to outpatient departments of nonfederal, short-stay hospitals. Using patient records, hospital staff completed questionnaires for a random sample of visits that occurred during a randomly assigned 4-week reporting period. We excluded visits made to emergency departments from the sample.

In 1994, the BPHC replicated the NHAMCS survey method (as described above) for a probability sample of visits made to community health centers.⁷ The target universe included visits to community health centers, including all of their delivery sites that received funds through the BPHC grant program under Section 330 of the Public Health Service Act (42 USC 2546). Grantee centers in operation fewer than 2 years were excluded from the sampling frame.

Additional details of the surveys' methods are available elsewhere.⁵⁻⁷ The response rates for in-scope physicians or clinics were 95% for hospital outpatient departments, 100% for community health centers, and 70% for physicians' offices. For the items in this study, the survey instruments from all 3 data

sources used the same questions, which were listed in the same order.

We also used the 1998 NAMCS⁸ and 1998 NHAMCS⁹ for a 1994-1998 time trend analysis. Because physicians practicing in community health centers were in-scope for the NAMCS, these 2 data sources provided similar national estimates as the 3 from 1994. The methods for the 1998 surveys were the same as for counterparts done in 1994. Response rates for in-scope physicians or clinics in 1998 were 68% for physicians' offices and 98% for hospital outpatient departments.

Primary Care Visit Samples

Several exclusion criteria were applied to the data sets to obtain samples of primary care visits. In the NAMCS data sets, we selected visits made to general pediatricians, family physicians, general internists, and obstetricians/gynecologists; in the NHAMCS data sets, visits to medical, obstetric, and pediatric clinics were selected; and in the BPHC data set, we selected all visits because community health centers are organized to deliver primary care.

We removed visits made to specialists or specialized clinics falsely identified as generalists or general clinics because self-designated specialty information can overestimate the number of generalist physicians." Physicians in the NAMCS data set who did not provide any preventive care (defined by reasons for encounter and diagnosis codes) were excluded; similarly, clinics in the NHAMCS data set that did not provide preventive care during at least 10% of their visits were excluded. Physicians and clinics that recorded at least 20 visits and gave diagnosis codes in the same clinical area (cardiology, endocrinology, etc) for greater than 50% of these visits also were excluded from the sample. Applying these exclusion criteria yielded unweighted sample sizes for the 1994 data sets of 2878 (100% of total) primary care visits made to 48 community health centers, 9853 (29.3% of total) made to offices of 409 physicians, and 10371 (35.6% of

total) made to 162 hospital outpatient departments. The exclusion criteria applied to the 1998 data sets yielded 6913 visits (29.6% of total) made to the offices of 263 physicians, and 11600 (39.4% of total) made to 175 hospital outpatient departments.

Variable Construction

Diagnosis and reason for encounter codes were used to identify routine/preventive care visits. Specific items from each survey allowed further classification of patient presentation by new vs established patients; among new patients, those referred by another physician; and among established patients, those presenting with new health problems. (These items were not available in the 1998 surveys.) Higher percentages of established patients presenting with new problems suggest better continuity of care."

The case-mix index was based on the Johns Hopkins Adjusted Clinical Groups (ACG) Case-Mix system.¹² The ACG system assigns all International Classification of Diseases, *Ninth* Revision, Clinical Modification (ICD-9-CM)¹³ codes to 1 of 32 morbidity groups, or diagnostic groups called ADGs. In all surveys, up to 3 ICD-9-CM codes were recorded for each visit; thus, each visit could be assigned up to 3 unique ADGs. The case-mix index was the sum of ADG-specific resource intensity weights. The weights were obtained from ADG β coefficients derived from regression analyses done for 4 large commercial health plans in which total patient charges were regressed on the 32 ADGs. (Details of this method, including the specific weights used, are available from the authors.) To simplify interpretation of the case-mix index, raw scores were standardized to a mean (SD) of 50 (10) for the combined sample. Higher case-mix index scores indicate greater medical complexity, sicker patients, and higher expected resource use.

To assess visit intensity, we predicted the duration of each visit based on the age and sex of the patient, type of patient presentation, case-mix in-

dex, and diagnosis codes. Estimating visit intensity using expected visit duration is a method used previously in the development of Ambulatory Visit Groups, a case-mix measure developed in the 1980s using NAMCS data. Visit duration weights were the β coefficients obtained from regressing visit duration in minutes on the covariates described above using generalist and obstetric patient visits from the 1989-1993 NAMCSs (<http://www.cdc.gov/nchs/about/major/ahcd/ahcdl.htm>).

Patient management practices were compared across the delivery sites on the disposition of the patient following visits and whether any of the following were done during the visits: medication(s) prescribed, laboratory tests, imaging studies, minor surgery, or a blood pressure check during a routine, preventive care visit. Each 1994 data set included a disposition variable that identified visits in which no follow-up encounters were scheduled, specialty referrals were made, or patients were admitted to hospital. Disposition was not available in the 1998 data sets. Information on laboratory tests, imaging studies, and minor surgery was not collected in the community health center survey.

Data Analysis

Sampling weights that accounted for the multistage sample design and nonresponse of in-scope practitioners were used to obtain national estimates of numbers of visits made to each primary care delivery site. Population rates of visits per 100 persons in the United States were based on the US Bureau of the Census estimates of the mid-year, civilian, non-institutionalized US population.¹⁶ Physicians working in community health centers are theoretically in scope for the NAMCS. For the 1994 primary care visit estimates, we subtracted the count of visits to community health centers from the count of visits for physicians' offices.

Type of patient presentation, diagnostic case-mix of patients, visit intensity, and patient management of primary care visits were compared across the 3 delivery sites. Statistical analyses using unweighted data contrasted proportions (x2

Table 1. All Visits and Primary Care Visits Made to Primary Care Delivery Sites in the United States for 1994

	Primary Care Delivery Site				Total
	Community Health Center	Physicians' Offices	Hospital Outpatient Department	Outpatient	
All visits					
No. in thousands (%) [†]	13051 (1.7)	668 406 (89.4)	66 345 (18.9)		747 802 (100)
No. per 100 persons per year [†]	5.1	261.7	26.0		292.8
Primary care visits					
No. in thousands (%) [†]	13051 (4.0)	290 649 (89.3)	21 348 (6.7)		325 048 (100)
No. per 100 persons per year [†]	5.1	113.8	8.4		127.3

[†]Visit counts were multiplied by sampling weights, which account for the multistage sample design and nonresponse of in-scope practitioners, to obtain national estimates.

[†]Based on the US Bureau of the Census estimates of the noninstitutionalized US civilian population as of July 1, 1994.¹⁶

analysis) and means (t tests) of physicians' offices with the 2 traditional safety-net delivery sites-community health centers and hospital outpatient departments. Because delivery of preventive care depends primarily on the age-sex distribution of a population, the regression analyses for routine/preventive care controlled for age-sex groups only. Other logistic regression analyses controlled for age, sex, payer, race/ethnicity, case-mix, and rural residence (nonstandard statistical metropolitan areas).

Multivariable linear regression was used to adjust case-mix index means for differences in other patient characteristics.

RESULTS

In 1994, approximately 747.8 million outpatient visits were made to community health centers, hospital outpatient departments, and physicians' offices, a rate of 2.9 visits per person (TABLE 1). Of the 747.8 million visits, an estimated 325 million (43.5%) were primary care visits, a rate of 1.3 primary care visits per person. Obstetric services for pregnant women, defined by diagnosis codes, comprised 5.8% of primary care visits made to community health centers, 3.9% to physicians' offices, and 3.9% to hospital outpatient departments.

Community health centers constituted 4.0%, hospital outpatient departments 6.7%, and physicians' offices 89.3% of all primary care visits (Table 1). The distribution of primary care visits for patients with either Medicaid or

no insurance was 10.6% to community health centers, 11.5% to hospital outpatient departments, and 77.9% to physicians' offices. A similar distribution was found for primary care visits made by ethnic minorities: 11.2% to community health centers, 11.9% to hospital outpatient departments, and 76.9% to physicians' offices. However, a smaller percentage of primary care visits for ethnic minorities with either Medicaid or no insurance were made to physicians' offices: 19.6% to community health centers, 17.5% to hospital outpatient departments, and 62.9% to physicians' offices.

Patient Characteristics

The number, percent distribution, and annual rates of primary care visits are shown by delivery site and patient characteristics in TABLE 2. Primary care visits made by either uninsured persons or those with Medicaid financing accounted for 65.4% of those made to community health centers, 43.0% to hospital outpatient departments, and only 18.5% to physicians' offices. Rural dwellers comprised 49.6% of community health center primary care visits, which contrasted with 19.7% in physicians' offices and 5.1% in hospital outpatient departments.

Compared with the white, non-Hispanic population, the overall primary care visit rates to all 3 types of facilities for the Hispanic population were 20% lower and 33% lower for the black, non-Hispanic population. The Asian/

Pacific Islander and white, non-Hispanic populations had similar primary care visit rates.

For the Hispanic vs white, non-Hispanic populations, rates of primary care visits made to community health centers were 700% higher, 79% higher to hospital outpatient departments, but 35% lower to physicians' offices. For the black, non-Hispanic vs white, non-Hispanic populations, rates of primary care visits made to community health centers were 550% higher, 93% higher to hospital outpatient departments, and 48% lower to physicians' offices.

Visit Complexity

TABLE 3 compares the type of patient presentation, diagnostic case-mix of patients, and predicted visit duration of primary care visits made to the 3 delivery sites. Among established patients, the odds that primary care visits were for new health problems were significantly higher in community

health centers compared with physicians' offices and hospital outpatient departments. A greater proportion of primary care visits made to hospital outpatient departments were for new patients, many of whom were physician-referred, than those made to physicians' offices.

The case-mix index of patient visits was 2.8% higher, suggesting a sicker patient population, in hospital outpatient departments than physicians' offices and was similar between community health centers and physicians' offices (Table 3). The case-mix of primary care visits made by the elderly population to the 3 types of delivery sites was similar, whereas the case-mix index for primary care visits made by children and adolescents was 1.7% higher in community health centers and 4.7% higher in hospital outpatient departments than physicians' offices.

Visit intensity is a measure of the predicted duration of the visit based on clinical characteristics of the patient and the

type of patient presentation. The overall visit intensity of hospital outpatient departments was 4.5% higher than physicians' offices (Table 3). The higher visit intensity in hospital outpatient departments translates into visits expected to be about 40 seconds longer than those in physicians' offices; visits for children and adolescents were predicted to be more than 2 minutes (132 seconds) longer in hospital outpatient departments than physicians' offices.

Patient Management

TABLE 4 contrasts patient management by primary care delivery site. The adjusted odds ratio of blood pressure checks during routine check-ups was highest in hospital outpatient departments. Controlling for differences in patient case-mix and other characteristics, the service intensity of hospital outpatient department visits was higher than those made to physicians' offices. Specifically, the adjusted odds ratios of

Table 2. Number of Primary Care Visits Made to Primary Care Delivery Sites in the United States in 1994 Based on Demographic Characteristics*

Patient Characteristics	Overall		Community Health Centers		Physicians' Offices		Hospital Outpatient Departments	
	In Thousands	Per100 Persons per Year (%)	In Thousands	Per 100 Persons per Year (%)	In Thousands	Per100 Persons per Year (%)	In Thousands	Per100 Persons per Year (%)
Age, Y								
0-17	104979 (32.3)	155.0	4638 (37.0)	6.8	92231(31.7)	136.2	8110 (38.0)	12.0
18-64	166600 (51.3)	106.7	6543 (52.1)	4.2	149 427 (51.3)	95.7	10630 (49.8)	6.8
≥65	53467 (16.4)	169.6	1370 (10.9)	4.3	49489 (17.0)	157.0	2608 (12.2)	a.3
sex								
Female	196548 (60.5)	149.4	8391 (64.3)	6.4	175 459 (60.4)	133.4	12 698 (59.5)	9.7
Male	128 500 (39.5)	103.8	4660 (35.7)	3.8	115190(39.6)	93.0	8650 (40.5)	7.0
Race/ethnicity								
Hispanic	28 087 (8.6)	109.1	3608 (31.7)	14.0	21205 (7.3)	82.4	3275 (15.3)	12.7
Black, non-Hispanic	27 425 (8.4)	91.0	3356 (29.5)	11.1	19930(6.8)	66.1	4140 (19.4)	13.7
Asian/Pacific Islander	11 910 (3.7)	141.0	539 (4.7)	6.4	10903 (3.7)	129.1	468 (2.2)	5.5
White, non-Hispanic	257 622 (79.2)	134.9	3891 (34.1)	2.0	240 265 (82.2)	125.8	13466 (63.1)	7.0
Health Insurance payer								
Medicare	49117 (15.1)	NA	1375 (10.6)	NA	44 899 (15.4)	NA	2843 (13.3)	NA
Medicaid	38120 (11.7)	NA	5151 (39.7)	NA	26367 (9.1)	NA	6602 (30.9)	NA
Private	190681 (58.7)	NA	2754 (21.2)	NA	180 226 (62.0)	NA	7701 (36.1)	NA
Uninsured	33376 (10.3)	NA	3339 (25.7)	NA	27 458 (9.4)	NA	2579 (12.1)	NA
Other payment	13 758 (4.2)	NA	350 (2.7)	NA	11 785 (4.1)	NA	1623 (7.6)	NA
Rural residence								
Yes	64 752 (19.9)	124.0	6476 (49.6)	12.4	57 181 (19.7)	109.5	1095 (5.1)	2.1
No	260 293 (80.1)	125.1	6575 (50.4)	3.2	233 465 (80.3)	112.2	20 253 (94.9)	9.7

*Visit counts were multiplied by sampling weights, which account for the multistage sample design and nonresponse of in-scope practitioners, to obtain national estimates. Rates were based on the US Bureau of the Census estimates of the US civilian noninstitutionalized population as of July 1, 1994. NA indicates that visit rates were not calculated by health insurance payer because denominators were not available.

having an imaging study, minor surgery, or specialty referral were all higher among primary care visits in hospital outpatient departments vs those in physicians' offices.

**Time Trend Analysis:
Primary Care Visits in 1998**

In 1998, the US population made an estimated 3.4 visits per person, 45.6% of which were for primary care. Compared with 1994, similar proportions of visits were made to hospital outpatient departments in 1998 (6.7% and 6.9%, respectively) and made by ethnic minorities (20.9% vs 26.2%). The payer mix of visits to physicians' offices and hospital outpatient departments in 1994 and 1998 was similar. In 1998, the case-mix of patient visits to hospital clinics was 3.9% higher than physicians' offices; visit intensity was 5.6% higher. For those management variables available in data sets from both years, the trends in practice patterns between hospital outpatient departments and physicians' offices found in 1994 held true in 1998.

COMMENT

This study used 3 nationally representative surveys to contrast primary care visits made to community health centers, physicians' offices, and hospital outpatient departments. The US population made an estimated 1.3 to 1.5 primary care visits per person per year, which constituted 43.5% to 45.6% of all ambulatory visits made to these delivery sites. Most primary care visits occurred in physicians' offices, even for vulnerable subpopulations identified by a single personal characteristic, such as race/ethnicity. However, about 40% of primary care visits for ethnic minorities with either no insurance or Medicaid were made to traditional safety-net delivery sites, such as community health centers and hospital outpatient departments. This finding demonstrates the importance of examining the impact of multiple vulnerable characteristics in studies on access and service use.

Several caveats should be considered when interpreting this study's data on primary care visit rates. Some safety-

net delivery sites were not included. The Veterans Affairs and Indian Health Service network of primary care clinics were not part of our combined database. Exclusion of these federal delivery sites is likely to have a small impact on visit rates estimates: it has been estimated that Veterans Affairs clinics provide services to about 1.7 million low-income veterans.¹⁷ Although locally funded health departments were not explicitly evaluated in this study, physicians in these delivery sites were in the sampling frame of the NAMCS, and visits to them were categorized in the physicians' offices group. Second, the sampling frame of the NAMCS survey of physicians' offices excluded nurse practitioners and physician assistants, who are becoming in-

creasingly important in the provision of primary care.¹⁸ Third, we used algorithms to identify primary care providers in the 3 surveys and then classified all visits to these physicians and clinics as primary care. Our methods may have overestimated the number of primary care visits to the extent that generalist physicians and obstetrician/gynecologists deliver some specialty care services. On the other hand, the method may have underestimated primary care visits to the extent that specialists provide primary care. To examine how these potential biases may influence our estimates, we examined the 1998 NAMCS survey,⁸ which contained an item that asked physicians to report whether they were the patient's primary care practi-

Table 3. Primary Care Visits Made to Primary Care Delivery Sites in the United States, 1994

Patient Presentation	Community Health Centers	Physicians' Offices	Hospital Outpatient Departments
Type of visit: routine/preventive care			
Unadjusted %	29.0	28.6	29.2
Adjusted odds ratio (95% CI)*	0.95 (0.86-1.04)	1.00	1.01 (0.95-1.08)
Type of patient: new patient			
Unadjusted %	11.5	12.4	18.6‡
Adjusted odds ratio (95% CI)†‡	0.94 (0.80-1.10)	1.00	1.72 (1.58-1.88)
Among new patients: referred by outside physician for primary care visit			
Unadjusted %	4.6‡	12.7	29.0‡
Adjusted odds ratio (95% CI)†‡	0.31 (0.16-0.60)	1.00	2.97 (2.39-3.69)
Among established patients: newly presenting health problems			
Unadjusted %	50.2‡	35.0	25.9%
Adjusted odds ratio (95% CI)†‡	1.77 (1.57-1.99)	1.00	0.70 (0.65-0.76)
Adjusted case-mix index, mean§			
Total sample (age, y)	49.3	49.4	50.8‡
Children (0-7)	47.2	46.4	48.6‡
Adults (18-64)	49.0	49.3	50.6‡
Elderly (≥65)	55.9	56.9	56.7
Visit intensity, predicted visit duration, min¶			
Total sample (age, y)	15.2‡	15.6	16.3‡
Children (0-7)	13.6	13.5	15.7‡
Adults (18-64)	16.1	16.2	16.5‡
Elderly (≥65)	16.5‡	17.3	16.9‡

*Logistic regression controlled for age and sex groups. CI indicates confidence interval.
 †Logistic regression controlled for age, sex, race/ethnicity, payer, rural residence, and case-mix. The physicians' offices was the reference group.
 ‡P < .001.
 §Higher scores of the case-mix index indicate sicker patient populations. Multivariable linear regression controlling for age, sex, race/ethnicity, payer, rural residence, and type of patient presentation was done to adjust means. Statistical significance compares the means of community health centers and hospital outpatient departments with the mean case-mix index for physicians' offices.
 ¶.05 < P < .011.
 ††A predicted visit duration was based on the age and sex of patient, type of patient presentation (self-referred new patient, physician-referred new patient, or established patient), and presenting health problems. The means for community health centers and hospital outpatient departments were compared with the mean for physicians' offices using t tests.

tioner. Analysis revealed that 85.4% of visits to generalist physicians, 24.6% to obstetricians/gynecologists, and just 8.8% to specialists were for patients for whom physicians reported they were the primary care practitioner. Fourth, differences in survey administration between the NAMCS (physicians completed the questionnaires) vs the other 2 surveys (medical record abstraction) could affect the diagnosis coding and thus the morbidity assessments. Analysis of the ICD codes recorded for each visit revealed no significant differences in the mean numbers or the percentages with more than 1 code among the 3 delivery sites.

Primary Care Visits in Community Health Centers

Continuity of care, one of the hallmark features of primary care," was better in

community health centers than other delivery sites. Established patients at community health centers were more likely to present with new health problems compared with the other delivery sites. Better continuity of care allows practitioners to use more watchful waiting and employ health care resources more judiciously, an association that helps explain the lower likelihood of prescribed medications during primary care visits to community health centers.

The medical complexity and patient management of primary care visits in community health centers compared favorably with physicians' offices. None of the measures in this study, however, assessed the social complexity of patients, which should be greater in community health centers because of their higher burden of low-income patients. The impact of patients' social risk on the

overall complexity and resultant resource intensity of primary care visits is likely to have a positive effect.

Physicians working in community health centers were theoretically in-scope in the NAMCS. To calculate primary care visit rates, we subtracted the count of visits to community health centers from the count of visits for physicians' offices. However, for the comparative analyses of patient mix and service use, no such adjustment was made. The bias that may result from this overlap in sampling frames is likely to be negligible because the number of community health center visits possibly included in the physicians' office sample was very small.

Primary Care Visits in Hospital Outpatient Departments

The medical complexity of patient visits in hospital outpatient departments was greater than those made to other delivery sites. Using a measure of visit intensity that predicted the visit duration, we estimated that the patient population visiting hospital outpatient departments was 4% to 6% sicker than the population visiting physicians' offices. This estimate is consistent with the study by Lion and Altman¹⁴ from the 1970s, which used a similar measure and found 5% to 15% higher visit intensity at hospital outpatient departments vs physicians' offices. An important clinical implication of the greater visit intensity is that primary care visits to hospital clinics may last longer than those to physicians' offices—as much as 2 minutes per visit for children and adolescents.

Even after differences in case-mix and other patient characteristics were controlled for, the service intensity among primary care visits in hospital outpatient departments exceeded that of visits made to physicians' offices. Hospital outpatient department visits were more likely than visits to physicians' offices to be associated with a specialty referral, minor surgery, and imaging studies. These findings are consistent with studies using Medicaid claims data that showed patients who use hospital outpatient departments incurred higher risk-adjusted expenditures than those

Table 4. Patient Management of Primary Care Visits Made to Primary Care Delivery Sites in the United States During 1994*

Patient	Community Health Center	Physicians' Offices	Hospital Outpatient Departments
Disposition			
No follow-up			
Unadjusted %	35.8	36.8	30.8†
Adjusted odds ratio	0.98 (0.87-1.10)	1.00	0.95 (0.89-1.02)
Specialty referral			
Unadjusted %	5.7	5.4	7.8†
Adjusted odds ratio	1.02 (0.81-1.28)	1.00	1.40 (1.24-1.59)
Hospital admission			
Unadjusted %	0.40	0.60	0.90
Adjusted odds ratio	0.74 (0.36-1.53)	1.00	1.28 (0.89-1.83)
Interventions			
Medication prescribed			
Unadjusted %	68.5‡	71.1	68.0‡
Adjusted odds ratio	0.82 (0.73-0.92)	1.00	0.95 (0.89-1.02)
Laboratory test			
Unadjusted %	N A	35.9	34.45
Adjusted odds ratio	N A	1.00	0.91 (0.85-0.97)
Minor surgery			
Unadjusted %	N A	3.4	3.8
Adjusted odds ratio	N A	1.00	1.48 (1.26-1.75)
Imaging study			
Unadjusted %	N A	12.8	13.3
Adjusted odds ratio	N A	1.00	1.12 (1.02-1.24)
Blood pressure checked during routine check-up			
Unadjusted %	63.0-f	70.0	55.5‡
Adjusted odds ratio	1.03 (0.80-1.33)	1.00	1.33 (1.14-1.56)

*Odds ratios adjusted for patient age, sex, race/ethnicity, payer, rural residence, case-mix, and patient presentation. Numbers in parentheses are the 95% confidence intervals. NA indicates these items were not available for the community health center survey. The physicians' offices was the reference group in these analyses.

†P < .001.
‡01 < P ≤ .001.
§.05 < P ≤ .01.

who used physicians' office.^{19,20} Greater resource use in hospital outpatient departments could be a consequence of better availability of ancillary and specialty services. Furthermore, the poorer continuity of care among visits to hospital outpatient departments may contribute to a more aggressive practice style, because of less familiarity with patients' health histories. Greater service intensity and poorer continuity of care in hospital outpatient clinics compared with other delivery sites also raise the concern over the suitability of these clinics as primary care delivery sites. However, until studies are done that compare health outcomes across delivery sites, we can make no conclusions about which service use rate is best.

Policy Implications

The main findings from this study are from data collected in 1994. To assess the applicability of these data for current policy decisions, we conducted sensitivity analyses using data from 1998. Our findings showed remarkable similarity between the 1994 and 1998 results, suggesting that our primary care visit analyses are applicable to current health care policy. Overall primary care visit rates and patient mix were similar, and higher service intensity in hospital outpatient departments compared with physicians' offices was found in both years. This sensitivity analysis was limited by not including specific community health center estimates and not explicitly evaluating the impact of managed care. Some safety-net delivery sites have been responding to the pressures of health care system change by forming integrated delivery systems and expanding their contracts with managed care plans to attract paying patients.²¹ Despite these new organizational arrangements, the patient and payer mix at community health centers has remained relatively constant over this time period, according to BPHC estimates (Jerrilynn Regan, MSN, MPA, BPHC, Health Resources and Services Administration, oral communication, August 2000).

Our estimates indicate that 1 in 25 primary care visits in the nation occurred in community health centers. The patient population making visits to community health centers was characterized by larger shares of ethnic minorities, individuals with Medicaid or no insurance, rural dwellers, and women receiving obstetric services compared with the other 2 delivery sites. An important implication of these findings is that federal policy that affects the financing or organization of community health centers will have its greatest impact on access for these vulnerable subpopulations.

This study documented large inequalities between ethnic minorities and whites in primary care visit rates. Compared with the white population, the Hispanic population made 20% fewer primary care visits per person and the black, non-Hispanic population made 33% fewer primary care visits per person. Can expansions in the capacity of community health centers—the main federal policy lever for improving nonfinancial access to care for vulnerable populations—eliminate these disparities? If the number of community health centers were doubled and the composition of patient populations did not change for the delivery sites, the white-Hispanic primary care visit disparity would be reduced by 50%, but the white-black disparity would be reduced by just 24%. These are significant reductions in access disparities and move our nation closer to a more equitable primary care system. However, eliminating race/ethnicity inequalities in use of primary care will require policy directed at improving vulnerable populations' access to mainstream physicians' offices as well as traditional safety-net delivery site.

Funding/Support: Funding was provided by the Bureau of Primary Health Care, Health Resources and Services Administration, Department of Health and Human Services.

Previous Presentation: This study was presented in part at the 1999 Pediatric Academic Societies meeting, May 4, 1999, San Francisco, Calif.

Acknowledgment: Robert Politzer, MS, ScD, CAS, Jerrilynn Regan, MSN, MPA, and Barbara Starfield, MD,

MPH, gave thoughtful comments on the manuscript. Sarah von Schrader, MA, provided excellent technical support

REFERENCES

1. Bureau of Primary Health Care. 1994-1995 Annual Report. Rockville, Md: US Department of Health and Human Services, Health Resources and Services Administration; 1996
2. Bureau of Primary Health Care. State profiles. Available at: <http://www.bphc.hrsa.gov/ear/sitepro.html>. Accessed September 27, 2000
3. Medicaid Access Study Group. Access of Medicaid recipients to outpatient care. *N Engl J Med*. 1994; **330**:1426-1430
4. Long SH, Marquis MS. Geographic variation in physician visits for uninsured children. *JAMA*. 1999; **281**:2035-2040.
5. Schappert SM. National Ambulatory Medical Care Survey: 1994 summary. In: *Advance Data From Vital and Health Statistics*. Hyattsville, Md: National Center for Health Statistics; 1996. No. 273.
6. Lipkind KL. National Hospital Ambulatory Medical Care Survey: 1994 outpatient department summary. In: *Advance Data From Vital and Health Statistics*. Hyattsville, Md: National Center for Health Statistics; 1996. No. 276.
7. Bureau of Primary Health Care. *Technical Report on Community Health Center User/Visit Survey Methodology*. Rockville, Md: US Dept of Health and Human Services, Health Resources and Services Administration; 1998.
8. Woodwell DA. National Ambulatory Medical Care Survey, 1999 summary. In: *Advance Data From Vital and Health Statistics*. Hyattsville, Md: National Center for Health Statistics; July 19, 2000. No. 315
9. Slusarcick AL, McCraig LF. National Hospital Ambulatory Medical Care Survey: 1998 outpatient department summary. In: *Advance Data from Vital and Health Statistics*. Hyattsville, Md: National Center for Health Statistics; July 27, 2000. No. 317.
10. Grumbach K, Becker SH, Osborn EH, Bindman AB. The challenge of defining and counting generalist physicians. *Am J Public Health*. 1995; **85**:1402-1407.
11. Starfield B. *Primary Care, Balancing Health Needs, Services, and Technology*. New York, NY: Oxford University Press; 1998.
12. Weiner JP, Abrams C, eds. The Johns Hopkins ACG Case-MIX System, February 2000. Available at <http://acg.jhsph.edu>. Accessed August 28, 2000.
13. *International Classification of Diseases, Ninth Revision, Clinical Modification*. Washington, DC: Public Health Service, US Dept of Health and Human Services; 1988.
14. Lion J, Altman S. Case-mix differences between hospital outpatient departments and private practice. *Health Care Financ Rev*. 1982; **4**:89-98.
15. Lion J, Malbon A, Henderson MC, Friedman RH. A comparison of hospital outpatient departments and private practice. *Health Care Financ Rev*. 1985; **6**:89-91.
16. US Population Estimates. Available at: <http://www.census.gov/population/www/estimates/uspop.html>. Accessed September 20, 2000.
17. Wilson JN, Kizer KW. The VA health care system. *Health Aff (Millwood)*. 1997; **16**:200-204.
18. Cooper RA, Laud P, Dietrich CL. Current and projected workforce of nonphysician clinicians. *JAMA*. 1998; **280**:788-794.
19. McDevitt RD, Dutton B. Expenditures for ambulatory episodes of care. *Health Care Financ Rev*. 1989; **11**:43-55.
20. Stuart ME, Steinwachs DM. Patient-mix differences among ambulatory providers and their effects on utilization and payments for Maryland Medicaid users. *Med Care*. 1993; **31**:1119-1137.
21. Lipson DJ, Naierman N. Effects of health system change on safety-net providers. *Health Aff (Millwood)*. 1996; **15**:33-48.