

Primary Care Quality: Community Health Center and Health Maintenance Organization

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Objective: This study compares the primary health care quality of community health centers (CHCs) and health maintenance organizations (HMOs) in South Carolina to elucidate the quality of CHC performance relative to mainstream settings such as the HMO.

Methods: Mail surveys were used to obtain data from 350 randomly selected HMO users. Surveys with follow-up interviews were conducted to obtain data from 540 randomly selected CHC users. A validated adult primary care assessment tool was used in both surveys. Multivariate analyses were performed to assess the association of health care setting (HMO versus CHC) with primary care quality while controlling for sociodemographic and health care characteristics.

Results: After controlling for sociodemographic and health care use measures, CHC patients demonstrated higher scores in several primary care domains (ongoing care, coordination of service, comprehensiveness, and community orientation) as well as total primary care performance.

Conclusion: Users of CHC are more likely than HMO users to rate their primary health care provider as good, except in the area of ease of first contact. The positive rating of the CHC is particularly impressive after taking into account that many CHC users have characteristics associated with poorer ratings of care.

Since their inception in the 1960s, community health centers (CHCs) have served as a primary care safety net for the medically vulnerable populations in both inner-city and rural areas of the United States.¹⁻⁴ CHCs are private, non-profit organizations that receive public funding to provide comprehensive, coordinated, integrated health care, including

primary and preventive care services, within a single institutional setting for people residing in their service areas. Their central mission is to increase access to community-based primary health care services and improve the health status of medically vulnerable populations. In 1998, health centers nationwide consisted of nearly 700 organizations delivering services at almost 2,000 sites to an estimated 9 million people, among whom approximately 40% were uninsured, 65% were members of racial and ethnic minority groups, 6% were homeless, 33% were insured by Medicaid, 66% were living below the poverty level, and another 20% had incomes between 100 and 200% of the poverty level.⁵

Although CHCs have improved access to health care for medically vulnerable populations in the United States,⁶⁻¹³ limited research has been published regarding the quality of health care services provided in the CHC setting relative to mainstream settings.^{4,14-18} The purpose of this study was to compare primary care quality provided to patients seen by a CHC with that provided to patients seen by a health maintenance organization (HMO). The Institute of Medicine listed the quality attributes of primary care as accessibility, comprehensiveness, coordination, continuity, and accountability.¹⁹ Its 1994 report further defined primary care as "the provision of integrated, accessible health care services by clinicians who are accountable for addressing a large majority of personal health care needs, developing a sustained part-

Key Points

- Users of community health centers (CHCs) are more likely than health maintenance organization (HMO) users to rate their primary care as good, except in the area of ease of first contact.
- After controlling for sociodemographic and health care use measures, CHC patients demonstrated higher scores in several primary care domains (ongoing care, coordination of service, comprehensiveness, and community orientation) as well as total primary care performance.
- The positive rating of the CHC is particularly impressive after taking into account that many CHC users have characteristics associated with poorer ratings of care.

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nership with patients, and practicing in the context of family and the community" (p 1).²⁰ Using primary care attributes as quality measures is consistent with the prevailing literature that links high-quality primary care to improved health. Individual and ecological studies have demonstrated the association of primary care system measures and better health outcomes.²¹⁻³¹ Each of the main features of primary care (person-focused care over time, accessible care, comprehensive in the sense of meeting all common health needs, and coordination when people have to receive services elsewhere) are known to improve both the effectiveness and the efficiency of care.^{21,22,27,32-38}

This study emphasizes patients' experience of their care rather than their rating of satisfaction or providers' perception of their experience. Satisfaction ratings often depend on individuals' expectations and preferences, which vary widely and ultimately do not suggest ways in which the health care system can be improved.³⁴ Whereas providers are better equipped to judge the technical quality of care, patients are best suited to assess their own experience of care and the interpersonal aspect of the care they receive. Use of the HMO for comparison is consistent with the trend in health care delivery. Health care delivery is likely to continue to be delivered in a managed care environment for the foreseeable future, with increased penetration in both private and public sectors. Thus, comparing CHC health care delivery with that of HMOs not only serves to elucidate the quality of CHC performance relative to mainstream settings but also examines the extent to which the HMO is able to provide high-quality primary care to vulnerable populations relative to that provided by CHCs.

Patients and Methods

Patients

The study participants were patients in an HMO or a CHC in two counties of South Carolina. Both counties are part of Columbia, the capital and the third-largest city in South Carolina. The HMO is licensed according to an independent practice association HMO model in which primary care physicians act as gatekeepers and health care managers. Referral to specialists must be through primary care physicians, and specialists must be affiliated with the HMO. The HMO's major market has been large-group employers, including employees of state agencies as well as national and regional companies. Members of this plan are primarily from middle-income households. The CHC provides services to people including Medicaid recipients and low-income households at three sites in the two counties. These two settings were selected because they were the major sources of care for middle- and low-income individuals in the two counties. Samples of patients from these two settings allowed us to compare the quality of primary care that patients received, including

both middle- and low-income individuals, who receive services in regular physician offices and at CHC sites, respectively.

A minimum sample size of 300 for each setting was deemed necessary to conduct the comparative analysis.³⁹ For the HMO plan, a mail survey was used because it was considered the most efficient data-gathering method. In two prior longitudinal studies of the same HMO, we had alternately used mail surveys or telephone interviews for HMO members and obtained comparable results.^{40,41} We sent a cover letter with the questionnaire to 1,000 randomly selected members from a list of current HMO enrollees who had made at least one physician visit and invited them to participate in the project. A total of 350 individuals responded after three mailings. After excluding the nonresponders (due to wrong addresses or changed plans) ($n = 340$), the effective response rate was 53% (350 of 660). The respondents and nonresponders were not significantly different with regard to age and race.

For the CHC group, because of more frequent address changes and to enhance response rate, we solidified mail surveys with follow-up interviews with nonresponders during their regularly scheduled on-site visits. A total of 800 individuals were randomly selected and contacted. Three hundred fifty individuals responded to the surveys, and 190 responded during interviews. Taking only the refusal rate into account, the response rate was 67% (540 of 800). All interviews were conducted by graduate public health students trained in interactive sessions and completed in 1999. The analyses were restricted to those who identified the HMO or the CHC as their usual source of medical care (333 for the HMO plan and 490 for the CHC plan). Separate analysis (with mode of data collection entered into the regression model) indicated no bias toward satisfaction ratings due to the mode of data collection (ie, the regression coefficient of the variable mode was not significant).

Measures

We used the Primary Care Assessment Tool-Adult Edition (PCAT-AE) for data collection. PCAT-AE was developed by Johns Hopkins Primary Care Policy Center for Underserved Populations to measure the extent and quality of primary care services provided at a setting designated by consumers as their main source of general care and is consistent with a focus on the attributes of primary care that have been demonstrated to produce better outcomes of care at lower cost.³⁷ It focused on consumers' experiences with aspects of health care delivery rather than satisfaction with them. The questionnaire, which takes approximately 40 minutes to complete, can be administered by telephone, in face-to-face interviews, or by mail. A relatively high reading level is required to self-administer the questionnaire. Validation of the PCAT-AE published elsewhere³⁹ indicates that the hypoth-

esized domains for primary care have substantial reliability and validity, consistent with the findings with regard to the PCAT-Child Edition.⁴²

Domains of Primary Care

The validated PCAT-AE consists of seven scales representing five primary care domains: first contact-accessibility, first contact-use (first contact domain), ongoing care (longitudinal domain), coordination of services (coordination domain), comprehensiveness-services available, comprehensiveness-services received (comprehensiveness domain), and community orientation (derivative domain). First contact care implies accessibility to and use of services for each new problem or each new episode of a problem for which people seek health care. Longitudinality presupposes the existence of a regular source of care and the characteristics of the interpersonal relationship between that source and the patient. Coordination of care requires some form of continuity, either by practitioners, medical record keeping, or both, as well as recognition of problems that are addressed elsewhere and the integration of care into the total care of patients. Comprehensiveness implies that primary care facilities are able to provide or to arrange for all types of health care services, including referrals to secondary services for consultation, tertiary services for specific conditions, and essential supporting services such as home care and other community services.²⁷ Community orientation refers to the care provider's knowledge of community needs and involvement in the community. These primary care domains were consistent with the Institute of Medicine definition of primary care.^{14,15} The specific items representing the primary care domains are presented in Figure 1.

For consistency in response and scoring, all items representing the primary care domains were scored according to a 4-point Likert-type scale, with 1 indicating "definitely not," 2 indicating "probably not," 3 representing "probably," and 4 representing "definitely." The total score for each domain was derived by summing (after reverse-coding where appropriate) the values for all items under each domain. The total score for overall primary care achievement was derived by summing the values for all domains.

Sociodemographic and Health Care Measures

The sociodemographic characteristics included in the questionnaire were race, household income, and insurance coverage. Health care use measures included duration with usual source of care, physician choice, specialist visit, and trouble paying for health care.

Analysis

The purpose of the analysis was to compare the achievement of primary care quality attributes of the CHC and HMO settings. First, sociodemographic and health care character-

istics of patients in the CHC and the HMO were compared by performing χ^2 analysis to highlight the differences in target populations and service characteristics. Next, ordinary least squares multiple regression analysis was performed to assess the association of health care setting (HMO versus CHC) with primary care attributes while controlling for sociodemographic and health care characteristics. Further comparisons were made with regard to the achievement of the separate and total primary care attributes between the CHC and the HMO. *t* tests of differences in means were conducted, and multivariate analysis of variance was performed for comparison after adjustments were made for sociodemographic and health care covariates.

Results

Table 1 compares the HMO sample with the CHC sample with regard to sociodemographic and health care use measures. The HMO sample included predominantly white (81.6%) and higher-income individuals (86.8% with annual household income \$25,000 or more). In contrast, the CHC sample included predominantly nonwhite (83.2%) and lower-income individuals (85.9% with annual household income less than \$25,000). Although most of the HMO sample (93.6%) was insured all year, many patients in the CHC sample were uninsured (19.3%) or insured during only part of the year (18.2%). Compared with the CHC respondents, HMO users had been seeing their regular source of care for a longer time, were more likely to choose their own doctors and to visit specialists, and were less likely to have trouble paying for health care.

Table 2 presents the regression coefficients of health care setting, health care use, and sociodemographic characteristics with regard to primary care attributes represented by the total primary care score. The square of the multiple correlation coefficient (r^2) indicates that 21.19% of the variance in the dependent variable was explained by the independent variables in the model. The adjusted r^2 , 19.93%, takes into account the number of parameters used and the number of observations in the model.

Controlling for the influence of health care use and sociodemographic measures, health care setting was significantly associated with primary care attributes. Specifically, whether a patient was enrolled in the study HMO had a significant negative effect on whether the patient reported receiving high-quality primary care services. The average adjusted primary care score was nearly 11 points higher at the CHC than at the HMO ($P = 0.0056$). The finding for the setting variable confirmed the descriptive finding that HMO patients reported fewer attributes associated with high-quality primary care. Among health care use measures, factors positively associated with primary care quality were longer duration with usual source of care (5 or more years versus less than 1 year; $P = 0.0004$), physician choice (versus being

First Contact: Accessibility (4 items)

1. When the office is open and you get sick, would someone there see you the same day?
2. When the office is closed on Saturday and Sunday and you get sick, would someone there see you the same day?
3. When the office is closed and you get sick during the night, would someone be there to see you or talk with you that night?
4. When the office is closed, is there a telephone number you can call when you get sick?

First Contact: Utilization (3 items)

1. When you need a regular general checkup, do you go to your doctor before going somewhere else?
2. When you have a new health problem, do you go to your doctor before going somewhere else?
3. When you see a specialist, does your doctor have to approve it or provide a referral?

Ongoing Care (20 items)

1. When you go to see your doctor, do you see the same doctor or nurse each time?
2. Do you think that doctor or nurse understands what you say or ask?
3. Does your doctor answer your questions in ways that you can understand?
4. If you have a question, can you call and talk to the doctor who knows you best?
5. Does your doctor know you well as a person?
6. Does your doctor give you enough time to talk about your worries or problems?
7. Do you feel comfortable telling your doctor about your worries or problems?
8. Does your doctor know who lives with you?
9. Does your doctor know what problems are most important to you?
10. Does your doctor know your complete medical history?
11. Does your doctor know about your work or employment?
12. Would your doctor know if you had trouble getting or paying for medicine you needed?
13. Would your doctor be willing to meet with family members if you thought it would be helpful?
14. Does your doctor know about all of the medications you are taking?
15. Would your doctor let you look at your medical record if you wanted to?
16. When you go to your doctor, is your medical record always available?
17. Does your doctor call or send you the results of laboratory tests?
18. If the doctor who knows you best is not available and you have to see someone else, would your doctor get the information about that visit?
19. Would you recommend your doctor to a friend or relative?
20. Would you recommend your doctor to someone who does not speak English well?

Coordination of Services (8 items)

1. Did your doctor suggest that you see a specialist or receive special services?
2. Did the doctor know you made these visits to the specialist or to special services?
3. Did your doctor discuss with you different places you could have gone to get help with that problem?
4. Did your doctor or someone working with your doctor help you make the appointment for that visit?
5. Did your doctor write down any information for the specialist about the reason for the visit?
6. Did your doctor know the results of the visit?
7. After going to the specialist or special service, did your doctor talk with you about what happened at the visit?
8. Does your doctor seem interested in the quality of care you receive from that specialist or special service?

Comprehensiveness: Services Available (21 items)

1. Answer questions about nutrition or diet.
2. Immunizations (ie, "shots"), such as for influenza or tetanus.
3. Check to see whether your family is eligible for any social services program or benefits.
4. Suggestions for nursing home care for someone in your family.
5. Family planning or birth control methods.
6. Discussion of alcohol or drug abuse problems for you or a family member.
7. Counseling for mental health problems.

(continued on next page)

Fig. 1 Validated questionnaire items of the Primary Care Assessment Tool—Adult Edition.

(continued)

8. Test for lead poisoning.
9. Sew up a cut that needs stitches.
10. Counseling and testing for human immunodeficiency virus (HIV)/acquired immunodeficiency virus (AIDS).
11. Hearing screening.
12. Allergy shots.
13. Removal of wart.
14. Peroxidase antiperoxidase complex (ie, PAP) tests for cervical cancer.
15. Rectal examinations or sigmoidoscopy examinations for bowel cancer.
16. Smoking counseling.
17. Prenatal care.
18. Splinting for sprained ankle.
19. Care for an ingrown toenail.
20. What to do in case someone in your family is incapacitated and cannot make decisions about his or her care.
21. Changes in mental or physical abilities that are normal with aging.

Comprehensiveness: Services Received (13 items)

1. Advice about healthy and unhealthy foods.
2. Advice on seatbelt use or child safety seats.
3. Home safety, such as obtaining and checking smoke detectors and storing medicines safely.
4. Ways to handle family conflicts that arise from time to time.
5. Advice about appropriate exercise for you.
6. Tests for cholesterol level in your blood.
7. Checking on and discussing the medications you are taking.
8. Possible exposure to harmful substances in your home, at work, or in your neighborhood.
9. Ask whether you own a gun, as well as its storage or security.
10. For women: How to prevent osteoporosis or fragile bones.
11. For women: Care for menstrual or menopause problems.
12. For people older than 65 years of age: How to prevent hot water burns.
13. For people older than 65 years of age: How to prevent falls.

Community Orientation (3 items)

1. Would anyone at the doctor's office ever make a home visit?
2. Does your doctor know about health problems in your neighborhood?
3. How does (Dr. _____/Place P) get opinions and ideas from people that will help provide better health care?
Do they:
 - a. Conduct surveys of their patients to see if their services are meeting people's needs?
 - b. Conduct surveys in the community to find out about health problems that they should know about?
 - c. Ask family members to be on the board of directors or advisory committee?

Fig. 1 Continued.

assigned; $P = 0.0069$), visit to specialist (versus no specialist visit; $P = 0.0001$), and having trouble paying for health care (versus no trouble; $P = 0.0010$). After controlling for health care setting and use patterns, no sociodemographic measures included in the model were significant for predicting primary care quality.

Table 3 presents comparative results of primary care quality of the HMO and CHC settings. In the unadjusted comparisons, there was no significant difference in comprehensiveness of services available. HMO patients received significantly better primary care quality on the first contact domain (accessibility and use), whereas CHC patients re-

ported significantly higher scores on all other primary care domains (ongoing care, coordination of service, comprehensiveness, and community orientation). CHC patients also reported a higher overall primary care total score than HMO patients did.

In the adjusted comparisons (after controlling for race, income, insurance, duration of usual source of care, and physician choice), there was no significant difference in the first contact domain. However, CHC patients continued to demonstrate higher scores in other primary care domains (ongoing care, coordination of service, comprehensiveness, and community orientation). The adjusted average primary care

Table 1. Comparison of sociodemographic characteristics and health care services use among adult patients in health maintenance organizations and community health centers^a

Variables	HMO (%) (n = 333)	CHC (%) (n = 490)
Sociodemographic characteristics		
Race		
White	266 (81.6%) ^b	77 (16.8%) ^b
Nonwhite	60 (18.4%)	382 (83.2%)
Household income		
Under \$25,000	42 (13.2%) ^b	373 (85.9%) ^b
\$25,000 or more	276 (86.8%)	61 (14.1%)
How much of the past 12 months were you covered by any type of health insurance, including Medicaid?		
All year	307 (93.6%) ^b	279 (62.6%) ^b
Partial year	14 (4.3%)	81 (18.2%)
Never	7 (2.1%)	86 (19.3%)
Access to health care		
How long have you been going to your usual source of care?		
<1 yr	36 (10.9%) ^b	108 (22.2%) ^b
1–2 yr	66 (20.1%)	99 (20.4%)
3–4 yr	88 (26.7%)	104 (21.4%)
≥5 yr	139 (42.2%)	175 (36.0%)
Did you choose this doctor, or were you assigned there?		
You or someone in your family chose it.	287 (87.0%) ^b	347 (71.4%) ^b
You were assigned to it.	43 (13.0%)	139 (28.6%)
Have you ever visited a specialist or special services?		
Yes	230 (70.3%) ^b	216 (45.5%) ^b
No	97 (29.7%)	259 (54.5%)
In the past year, did you have trouble paying for health care?		
Yes	50 (15.2%) ^b	156 (34.3%) ^b
No	278 (84.8%)	299 (65.7%)

^aHMO, health maintenance organization; CHC, community health center.

^b $P < 0.01$ (χ^2 test).

total score by CHC patients was more than 10 points better than that of HMO patients (201.79 versus 191.50; $P < 0.01$).

Discussion

On the basis of patient-provided survey information collected in two health care settings in South Carolina, this study assessed the quality of primary care received by patients in a CHC and those in an HMO. Achieving the hallmarks of adequacy in the delivery of high-quality primary care services is an important goal for all primary care organizations. There is reason, therefore, to expect that different types of organiza-

Table 2. Health care setting and use and sociodemographic characteristics associated with primary care achievement by adult patients: Multiple regression analysis results^a

Dependent variables: Primary care achievement (total score) (n = 702)	Estimated coefficient (SEM)	P value
Intercept	187.40 (5.2668)	0.0001
Health care Setting		
HMO	-10.9886 (3.9517)	0.0056
CHC	0.0000	
Health care services use		
How long have you been going to your usual source of care?		
≥5 yr	12.922 (3.6061)	0.0004
3–4 yr	3.9522 (3.8612)	0.3064
1–2 yr	2.0303 (3.9807)	0.6102
<1 yr	0.0000	
Did you choose this doctor or were you assigned there?		
You or someone in your family chose it	8.2024 (3.0248)	0.0069
You were assigned to it	0.0000	
Have you ever had a visit to any kind of specialist or special services?		
Yes	29.2393 (2.5343)	0.0001
No	0.0000	
In the last year, did you have trouble paying for your health care?		
Yes	-10.0185 (3.0218)	0.0010
No	0.0000	
Sociodemographic characteristics		
Race		
White	-0.8837 (3.1764)	0.7809
Nonwhite	0.0000	
Household income		
\$25,000 or more	-3.4295 (3.6042)	0.3417
Under \$25,000	0.0000	
How much of the past 12 months were you covered by any type of health insurance, including Medicaid?		
All year	5.4479 (4.0812)	0.1824
Partial year	4.2718 (4.8780)	0.3805
Never	0.0000	
Model statistics		
r^2	21.19%	
Adjusted r^2	19.93%	
F statistic	16.863	0.0001

^aSEM, standard error of the mean; HMO, health maintenance organization; CHC, community health center.

tions should strive toward providing good primary care defined by a wide range of professional groups and experts.²⁰

Table 3. Comparison of primary care achievement among adult patients in health maintenance organizations and community health centers^a

Primary care domains (range of values)	HMO Mean % (SD)	CHC Mean % (SD)
Unadjusted primary care achievement		
First contact: Accessibility (4–16)	12.03 (2.41) ^b	10.71 (3.12) ^b
First contact: Utilization (3–12)	11.25 (1.54) ^b	10.38 (2.15) ^b
Ongoing care (20–80)	62.99 (11.35) ^b	68.49 (9.29) ^b
Coordination of services (8–32)	24.81 (6.18) ^b	26.80 (6.89) ^b
Comprehensiveness: Services available (21–84)	64.73 (12.21)	63.32 (16.49)
Comprehensiveness: Services received (13–52)	34.13 (10.27) ^b	36.99 (10.38) ^b
Community orientation (5–20)	9.76 (3.36) ^c	10.67 (4.29) ^c
Primary care total score (74–296)	193.43 (30.40) ^d	197.49 (33.81) ^d
Adjusted primary care achievement ^e		
First contact: Accessibility (4–16)	11.50 (0.22)	11.07 (0.20)
First contact: Utilization (3–12)	10.70 (0.15)	10.84 (0.13)
Ongoing care (20–80)	62.24 (0.76) ^b	69.64 (0.69) ^b
Coordination of services (8–32)	24.54 (0.47) ^b	26.94 (0.52) ^b
Comprehensiveness: Services available (21–84)	65.22 (1.09)	64.00 (0.99)
Comprehensiveness: Services received (13–52)	33.55 (0.80) ^b	37.11 (0.71) ^b
Community orientation (5–20)	9.63 (0.32) ^d	10.58 (0.28) ^d
Primary care total score (74–296)	191.50 (2.29) ^b	201.79 (2.06) ^b

^aHMO, health maintenance organization; SD, standard deviation; CHC, community health center. Statistical probabilities are based on *T* tests for unadjusted comparisons and analysis of variance for adjusted comparisons.

^b*P* < 0.01.

^c*P* < 0.05.

^d*P* < 0.10.

^ePrimary care scores adjusted for race, income, insurance, duration of usual source of care, and physician choice.

The results of the study indicate that CHC patients were more likely than HMO patients to report consistently the attributes of primary care associated with quality. This outcome is even clearer after adjusting for patient sociodemographic and health care use factors. Although no significant differences were noted in the first contact domain, CHC patients reported higher primary care scores with regard to on-

going care, coordination of services, comprehensiveness, community orientation, and overall primary care performance. The adjusted average primary care total score by CHC patients was considerably higher than that of the HMO patients.

In part, this finding may be explained by the importance placed on culturally competent and responsive care provided by CHCs. It is important to note that the CHCs have as their mission the provision of medical care to vulnerable populations, and their care providers are trained to tailor services according to the special needs of vulnerable populations. The same may or may not be said of HMOs, which historically have served primarily middle-income families. Although this HMO was able to provide good access to primary care, it fell short in providing quality primary care in other areas, particularly with regard to interpersonal, longitudinal aspects of care and the community orientation of care, presumably because most of the care provided by HMOs remains episodic and problem-focused rather than being holistic and individually and community-oriented. Furthermore, the annual turnover of patients from one HMO plan to another often weakens the continuity of care and severs the usual source of care relationship.^{43,44} Frequent changes in the usual source of care result in physicians' lack of knowledge about patients' medical history, family medical history, and health needs and thus weakens the patient-physician relationship.³³

Caution must be exercised in interpreting the results of this study because of several limitations. First, because this study was restricted to one locale and surveyed only one HMO plan and one CHC, the generalizability of the findings to other sites and states is not possible. Additional corroborative studies are needed. Furthermore, this study examined an HMO and a CHC rather than the distinguishing attributes of managed care (ie, gate-keeping arrangements, provider and patient financial inducements, restricted provider networks, limited choice of health care services)⁴⁵ or community health services (ie, low or no cost, patient rather than disease focus, comprehensiveness of services, cultural competence, community orientation). Future studies can identify which of the managed care and CHC attributes foster or impede primary health care delivery performance.

Second, this study examined the experience with rather than the outcome of primary health care services. Although numerous studies have linked primary care to better health outcome,^{21–31} further research is needed to examine how each of the primary care attributes is related to health outcome and which organizational arrangements with regard to HMOs and CHCs best provide these features. Such research can help to explain which processes and systems of care are most closely related to outcome so that limited resources can be used to focus on these combinations of attributes.

Third, the survey data on primary care are based entirely on respondent self-report. In addition to the usual recall and response set-related biases, self-report restricts the inclusion of questions about the technical quality of primary care.

However, self-report is the only way that people's actual experiences can be ascertained. Differences in data collection methods, although necessary because of respondents' characteristics, could also cause differences in reporting. Fourth, the cross-sectional nature of the analysis limited our ability to draw causal inferences from these findings. Longitudinal analysis is the next important step.

This study demonstrates that CHC users are more likely than HMO users to rate their primary care as good, except in the area of ease of first contact. The positive rating of the CHC is particularly impressive after taking into account that many CHC users have characteristics associated with poorer ratings of care. Given the managed care environment, in addition to cost savings, policy makers should closely monitor the quality of primary care provided by HMOs.

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References

1. U.S. General Accounting Office. *Community Health Centers: Challenges in Transitioning to Prepaid Managed Care* (GAO/HHS 95-138). Washington, DC, U.S. General Accounting Office, April 1995.
2. Freeman HE, Kiecolt KJ, Allen HM II. Community health centers: An initiative of enduring utility. *Milbank Mem Fund Q Health Soc* 1982; 60:245-267.
3. Gardner RJ. National health care reform and community and migrant health centers. *J Health Care Poor Underserved* 1993;4:268-271.
4. Dievler A, Giovannini T. Community health centers: Promise and performance. *Med Care Res Rev* 1998;55:405-431.
5. Shi L, Politzer RM, Regan J, et al. The impact of managed care on the mix of vulnerable populations served by community health centers. *J Ambul Care Manage* 2001;24:51-66.
6. Zwick DI. Some accomplishments and findings of neighborhood health centers. *Milbank Mem Fund Q* 1972;50:387-420.
7. Reynolds RA. Improving access to health care among the poor: The neighborhood health center experience. *Milbank Mem Fund Q Health Soc* 1976;54:47-82.
8. Seacat MS. Neighborhood health centers: A decade of experience. *J Community Health* 1977;3:156-170.
9. Rosenbaum S. *Community and Migrant Health Centers: Two Decades of Achievement*. Washington, DC, National Association of Community Health Centers, 1987.
10. Sardell A. *The United States Experiment in Social Medicine: The Community Health Center Program, 1965-1986*. Pittsburgh, University of Pittsburgh Press, 1988.
11. Patton LT. Community health centers at 25: A retrospective look at the first 10 years. *J Ambul Care Manage* 1990;13:13-21.
12. Zuvekas A. Community and migrant health centers: An overview. *J Ambul Care Manage* 1990;13:1-12.
13. Shi L, Frick KD, Lefkowitz B, et al. Managed care and community health centers. *J Ambul Care Manage* 2000;23:1-22.
14. Politzer RM, Yoon J, Shi L, et al. Inequality in America: The contribution of health centers in reducing and eliminating disparities in access to care. *Med Care Res Rev* 2001;58:234-248.
15. Regan J, Lefkowitz B, Gaston MH. Cancer screening among community health center women: Eliminating the gaps. *J Ambul Care Manage* 1999; 22:45-52.
16. Frick KD, Regan J. Whether and where community health center users obtain screening services. *J Health Care Poor Underserved* 2001;12: 429-445.
17. Falik M, Needleman J, Korb J, et al. *ACSC Experience by Usual Source of Health Care: Comparing Medicaid Beneficiaries Who Rely on CHCs with Medicaid and Beneficiaries Who Rely on Other Primary Care Providers*. Washington, DC, Bureau of Primary Health Care, Health Resources and Services Administration, U.S. Department of Health and Human Services, July 1998.
18. Ulmer C, Lewis-Idema D, Von Worley A, et al. Assessing primary care content: Four conditions common in community health center practice. *J Ambul Care Manage* 2000;23:23-38.
19. Division of Health Manpower and Resources Development, Institute of Medicine. *A Manpower Policy for Primary Health Care: Report of a Study* (IOM Pub. 78-02). Washington, DC, National Academy of Sciences, 1978.
20. Institute of Medicine. *Defining Primary Care: An Interim Report*. Washington, DC, National Academy Press, 1994.
21. Starfield B. *Primary Care: Balancing Health Needs, Services, and Technology*. New York, Oxford University Press, 1998, rev ed.
22. Bindman AB, Grumbach K, Osmond D, et al. Primary care and receipt of preventive services. *J Gen Intern Med* 1996;11:269-276.
23. Roos NP. Who should do the surgery? Tonsillectomy-adenoidectomy in one Canadian province. *Inquiry* 1979;16:73-83.
24. Shi L. The relationship between primary care and life chances. *J Health Care Poor Underserved* 1992;3:321-335.
25. Starfield B. Is primary care essential? *Lancet* 1994;344:1129-1133.
26. Shi L. Primary care, specialty care, and life chances. *Int J Health Serv* 1994;24:431-458.
27. Greenfield S, Rogers W, Mangotich M, et al. Outcomes of patients with hypertension and non-insulin-dependent diabetes mellitus treated by different systems and specialties: Results from the medical outcomes study. *JAMA* 1995;274:1436-1444.
28. Lohr KN, Brook RH, Kamberg CJ, et al. Use of medical care in the Rand Health Insurance Experiment: Diagnosis- and service-specific analyses in a randomized controlled trial. *Med Care* 1986;24(9 Suppl):S1-S87.
29. Keeler EB, Sloss EM, Brook RH, et al. Effects of cost sharing on physiological health, health practices, and worry. *Health Serv Res* 1987; 22:279-306.
30. Newhouse JP; The Insurance Experiment Group. *Free for All? Lessons from the Rand Health Insurance Experiment*. Cambridge, MA, Harvard University Press, 1993.
31. Starfield B. *Effectiveness of Medical Care: Validating Clinical Wisdom*. Baltimore, The Johns Hopkins University Press, 1985.
32. Starfield B. *Primary Care: Concept, Evaluation, and Policy*. New York, Oxford University Press, 1992.
33. Flocke SA, Stange KC, Zyzanski SJ. The association of attributes of primary care with the delivery of clinical preventive services. *Med Care* 1998;36(8 Suppl):AS21-AS30.
34. Starfield B, Cassady C, Nanda J, et al. Consumer experiences and provider perceptions of the quality of primary care: Implications for managed care. *J Fam Pract* 1998;46:216-226.
35. Safran DG, Kosinski M, Tarlov AR, et al. The Primary Care Assessment Survey: Tests of data quality and measurement performance. *Med Care* 1998;36:728-739.
36. Green LA. Science and the future of primary care. *J Fam Pract* 1996; 42:119-122.
37. Grumbach K. Separating fact from fiction: Family medicine, primary care, and the role of health services research. *J Fam Pract* 1996;43:30-33.

38. Donaldson MS, Vanselow NA. The nature of primary care. *J Fam Pract* 1996;42:113-116.
39. Shi L, Starfield B, Xu J. Validating the Adult Primary Care Assessment Tool. *J Fam Pract* 2001;50(2):E1.
40. Shi L, Huang Y, Kelly K, et al. Gastrointestinal symptoms and use of medical care associated with child day care and health care plan among preschool children. *Pediatr Infect Dis J* 1999;18:596-603.
41. Shi L, Lu N, Zhao M, et al. Respiratory symptoms and use of medical care associated with child day care and health care plan among preschool children. *J S C Med Assoc* 2000;96:335-340.
42. Cassady CE, Starfield B, Hurtado MP, et al. Measuring consumer experiences with primary care. *Pediatrics* 2000;105:998-1003.
43. Davis K, Collins KS, Schoen C, et al. Choice matters: Enrollees' views of their health plans. *Health Aff (Millwood)* 1995;14:99-112.
44. National Committee for Quality Assurance. *Technical Report: Report Card Pilot Project*. Washington, DC, National Committee for Quality Assurance, 1995.
45. Hellinger FJ. The effect of managed care on quality: A review of recent evidence. *Arch Intern Med* 1998;158:833-841.

Wisdom is knowing what to do next.
Skill is knowing how to do it.
Virtue is doing it.

—Thomas Jefferson

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