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Medicaid Patients Seen At Federally Qualified Health Centers Use Hospital Services Less Than Those Seen By Private Providers

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ABSTRACT **Federally qualified health centers, also known as community health centers, play an essential role in providing health care to millions of Americans. In return for providing primary care to underserved, homeless, and migrant populations, these centers are reimbursed at a higher rate than other providers by public programs such as Medicaid. Under the Affordable Care Act of 2010, the role of the centers is expected to grow. To examine the quality of care that the centers provide, the Colorado Department of Health Care Policy and Financing compared the use of costly hospital-related services by Medicaid clients whose usual source of care was a community health center with the use by clients whose usual source of care was a private, fee-for-service provider. The study found that community health center users were about one-third less likely than the other group to have emergency department visits, inpatient hospitalizations, or preventable hospital admissions. Public funders such as states should work with community health centers to improve the quality and reduce the cost of care even further.**

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Federally qualified health centers, also known as community health centers, are public or private nonprofit health organizations that offer primary care and preventive health services to all patients, regardless of their ability to pay. In return for providing primary care to underserved, homeless, and migrant populations, these centers are reimbursed at a higher rate than other providers by public programs such as Medicaid.[1] The Affordable Care Act of 2010 provides new funding for the centers as part of a move to increase the availability of primary care services to low-income and minority populations.[1]

In Colorado, as in many other states, community health centers are an important part of the health care safety net. The state has 140 centers, which operate in fifty-eight of Colorado's sixty-four counties and are managed by fifteen organizations.[2] Nearly all of the centers have programs devoted to improving the efficiency and effectiveness of the care they provide.

In 2009 Colorado community health centers served 452,391 patients,[2] or approximately 9 percent of the state's population.[3] The state's Medicaid program operates on a fee-for-service basis, and the centers participate as providers. The program contributes 36 percent of the centers' overall revenue, and the centers see 36 percent of Colorado Medicaid and Child Health Plan Plus clients.[4,5] The state's Child Health Plan Plus program offers free or low-cost health insurance for low-income children whose family incomes are nonetheless too high to qualify for Medicaid.

The health benefits of comprehensive primary care are numerous and well-known.[6] In general, access to primary care reduces health disparities across the population, including members of minority groups and people of lower socioeconomic status.[6] Studies of the Medicaid population in particular have shown that patients'

use of community health centers is associated with lower health care costs, less use of acute care, and fewer preventable hospitalizations, compared to patients who do not use the centers.[7–11]

The rate of preventable hospital admissions is a measure often used to assess how well community health centers are caring for Medicaid patients.[7–10] If a center's primary care is comprehensive enough, it should avert the use of costlier hospital care. Other researchers have asked how the centers compare to private fee-for-service providers in terms of comprehensiveness of care and overall effectiveness.

Given the high percentage of Medicaid clients in Colorado who use community health centers for primary care, and the increasing role that the centers will play with the passage of the Affordable Care Act, we wanted to investigate this question in more detail. Therefore, we analyzed Medicaid patients' emergency department visits, inpatient hospitalizations, preventable hospital admissions, and—unlike any previous study that we are aware of—ninety-day hospital readmissions.

Study Data And Methods

STUDY POPULATION The study population consisted of the 179,749 Colorado Medicaid clients who had two or more office or clinic visits during the state's fiscal year 2008 (July 1, 2007–June 30, 2008), who were not enrolled in a managed care organization during the year, and whose usual source of care was either a community health center or a private fee-for-service provider. Because we wanted to study clients who had a usual source of care, we excluded those with limited use of the health care system—fewer than two nondental clinic or office visits during the year. We also excluded clients who were sixty-five or older, those who were eligible for both Medicaid and Medicare, and those who were receiving hospice services.

All care included in the analysis was reimbursed on a fee-for-service basis. Because all clients were in the fee-for-service program and therefore were not assigned to any one provider, we adapted the Centers for Medicare and Medicaid Services' Physician Quality Reporting Initiative physician attribution methodology to accommodate Medicaid fee-for-service claims data and assign clients to a usual source of care.[12]

Of the 179,749 clients in the study population, 37,326 (21 percent) used one of the state's fifteen community health centers as their usual source of care, and 142,423 (79 percent) used a private fee-for-service provider (Exhibit 1; an expanded version of Exhibit 1 is available in the online Appendix).[13] Five of the fifteen community health centers each served 13–15 percent of the 37,326 clients. The other ten centers each served no more than 8 percent.

The clients we attributed to private fee-for-service providers could have as their usual source of care any type of facility besides a community health center, such as a hospital outpatient clinic, large private clinic, or individual provider's office. The private providers ranged from large group practices to practices with one or two providers.

We used one-way analysis of variance to compare means and binary logistic regressions to determine statistical significance and odds ratios between the two groups of clients. For all statistical analyses, we used the statistical software SPSS, version 17.0.

OUTCOMES OF INTEREST We were interested in four outcomes: emergency department visits, inpatient hospitalizations, hospital readmissions within ninety days of discharge, and preventable hospital admissions.

We included emergency department visits for any reason, except for those visits that resulted in an inpatient admission. *Inpatient hospitalizations* were defined as an inpatient discharge from a hospital during the fiscal year. An inpatient admission from the emergency department was counted as an inpatient hospitalization. We excluded one-day surgery or observation stays in a hospital.

EXHIBIT 1

Characteristics Of Colorado Medicaid Clients With A Usual Source Of Care, By Provider Type, Fiscal Year 2008

Clients' characteristics	Community health center (n = 37,326)	Private fee-for-service provider (n = 142,423)
SEX		
Male	41%	45%
Female	59	55
AGE (YEARS)		
0–5	37%	24%
6–17	28	38
18–24	7	8
25–44	15	17
45–64	14	12
RESIDENCE		
Rural county	15%	15%
Urban county	85	85
DISABILITY STATUS		
Disabled	18%	23%
Not disabled	82	77

SOURCE Authors' analysis of Medicaid Management Information System data for Colorado, July 1, 2007–June 30, 2008. **NOTES** Seven clients had inaccurate ages of less than zero at the end of the fiscal year and were therefore deleted from all analyses. Thirteen clients had "default" listed as their county and were therefore deleted from analyses involving residence.

If a center's primary care is comprehensive enough, it should avert the use of costlier hospital care.

Hospital readmissions were defined as clients who were readmitted to any hospital within ninety days after an initial hospital discharge. We selected ninety days—rather than seven or thirty days—because even in that relatively extended period there was a low rate of readmissions.

Preventable hospital admissions were defined as "conditions for which good outpatient care can potentially prevent the need for hospitalization or for which early intervention can prevent complications or more severe disease."[14] We used the Agency for Healthcare Research and Quality's Prevention Quality Indicators Technical Specifications to identify preventable hospital admissions.[15]

In addition to analyzing the overall preventable hospitalizations, we divided them into three categories: those for acute conditions; those for chronic conditions; and those for perforated appendicitis or low birthweight, which we included in the overall figures although we did not consider these two conditions either acute or chronic. The acute conditions were dehydration, bacterial pneumonia, and urinary tract infections.[16] The chronic conditions include four conditions related to diabetes (short- and long-term complications, lower-extremity amputations, and uncontrolled diabetes), chronic obstructive pulmonary disease, hypertension, congestive heart failure, angina, and asthma.[16] We obtained the data for these analyses from the Colorado Medicaid Management Information System, the state's claims payment system.

STATISTICAL ANALYSES We compared the demographic composition of the two groups of clients—those whose usual source of care was a community health center and those whose usual source of care was a private fee-for-service provider. To compare the two groups' likelihood of each outcome (emergency department visit, inpatient hospitalization, ninety-day hospital readmission, and preventable hospital admission), we used logistic regression.

The regression controlled for sex, age, rural or urban residence, and whether or not the client was disabled. The age groups we used are shown in Exhibit 1. We defined as *disabled* all clients receiving Medicaid because they were determined to be eligible for Social Security. We did not use race as a variable because many records had poor or missing data in that field.

LIMITATIONS This study has several limitations. First, it is possible that some of our results could be attributed to clients' receiving services not in the community health center that was their usual source of care but in a different center or state. These clients could be more transient or less likely to use sources of care consistently than clients who usually receive care from private providers.

Second, the private provider group includes a wide variety of providers, including those designated as medical homes, those with electronic health records, and those affiliated with management service organizations or active independent practice associations, as well as those fitting in none of these categories. As a result, it is difficult to identify any common factors that may have a bearing on the study's findings.

Third, we did not adjust the data based on diagnosis or combinations of diagnoses (risk adjustment), although our analysis accounted for age and disability status. And as previously mentioned, we could not control for race because of poor or missing data.

In addition, because the study used administrative claims data, we were unable to control for other possibly relevant variables such as education, income, employment status, and distance from residence to the usual source of care. Geocoding was not available at the time we conducted our analysis. Although administrative claims data are commonly used for studies such as ours, the accuracy of the data depends on the level of documentation and coding practices and norms.

Finally, although community health centers receive larger reimbursements than private fee-for-service providers do for a patient visit, this study did not look at costs. Therefore, we do not know if the cost of community health center reimbursement outweighs the lower use of services and better outcomes of the centers' clients.

However, we consider the general information presented here to be an important first step in identifying potential areas of improvement and further research.

Study Results

A higher percentage of community health center clients were female, age five or younger, and not

disabled, compared to the private providers' clients. The latter group had a higher percentage of clients ages 6–17 (Exhibit 1).

Before controlling for other factors, we found that a higher percentage of community health center clients had an emergency department visit, an inpatient hospitalization, and a preventable hospital admission for a chronic condition, compared to the clients of private fee-for-service providers. However, the controlled regression revealed lower odds for all outcomes for the community health center group compared to the private fee-for-service provider group. We discuss this difference below.

EMERGENCY DEPARTMENT VISITS Medicaid beneficiaries are known to have higher rates of emergency department use than either the uninsured or people with private insurance.[17] When we did not control for variables, we found that a higher percentage of the community health center clients visited the emergency department, compared to clients of private providers (Exhibit 2; an expanded version of Exhibit 2 is available in the online Appendix).[13] When we controlled for all other variables in the model, the odds that a community health center client would visit the emergency department were less than the odds that a private provider's client would, and this difference was statistically significant.

Exhibit 3 presents the results of the logistic regression for emergency department visits, inpatient hospitalizations, and ninety-day hospital readmissions (an expanded version of Exhibit 3 is available in the online Appendix).[13] Women and clients ages 18–24 were less likely to have an emergency department visit than men and clients in other age groups, respectively.

INPATIENT HOSPITALIZATIONS A higher percentage of the community health center group had an inpatient hospitalization, compared to the private provider group (Exhibit 2). However, controlling for other variables, the logistic regression analysis showed that the odds of a community health center client's having an inpatient hospitalization were significantly less than for the private fee-for-service provider group. Other factors lowering the odds of experiencing an inpatient hospitalization were being female and being under twenty-five years old. The odds of having an inpatient hospitalization increased for those ages 45–64 and for the disabled (Exhibit 3).

NINETY-DAY HOSPITAL READMISSIONS The odds of experiencing a ninety-day hospital readmission were significantly reduced for the community health center group as opposed to the private provider group (Exhibit 3). Factors associated with lower odds of a readmission include being ages 18–24 and being disabled. People ages 6–17 and 45–64 also tend to have lower likelihoods of a readmission, although these differences are not as pronounced as that for people ages 18–24.

PREVENTABLE HOSPITAL ADMISSIONS We report preventable hospital admissions as frequencies per 100,000 client years (Exhibit 2), to permit comparisons to the national data prepared by the Agency for Healthcare Research and Quality.[18]

The unadjusted overall preventable hospital admission rate for community health center clients was 3,882 per 100,000 client-years. That rate was 3,989 for the clients of private fee-for-service providers ($p = 0.743$). The odds of experiencing a preventable hospital admission

EXHIBIT 2

Percentages Of Colorado Medicaid Clients With A Usual Source Of Care Who Experienced An Outcome Of Interest, Fiscal Year 2008

	Community health center (n = 37,326)		Private fee-for-service provider (n = 142,423)	
Outcome	**Percent**	**Outcome rate per 1,000 client-years**	**Percent**	**Outcome rate per 1,000 client-years**
Emergency department visit	46.6	1,144	35.0****	912
Inpatient hospitalization	12.6	126	9.3****	131
90-day hospital readmission	1.3	16	0.9****	16
Outcome	**Percent**	**Outcome rate per 100,000 client-years**	**Percent**	**Outcome rate per 100,000 client-years**
Preventable hospital admissions for acute conditions	0.4	1,605	0.3****	1,973
Preventable hospital admissions for chronic conditions	0.5	2,277	0.3****	2,016
Total preventable hospital admissions	0.9	3,882	0.6****	3,989

SOURCE Authors' analysis of Medicaid Management Information System data for Colorado, July 1, 2007–June 30, 2008. **NOTE** A client-year is twelve months of enrollment in Medicaid. ****$p < 0.001$

EXHIBIT 3

Adjusted Odds Of Emergency Department Visit, Inpatient Hospitalization, And 90-Day Hospital Readmission Among Colorado Medicaid Clients, Fiscal Year 2008

Characteristic	Reference group	Emergency department visit	Inpatient hospitalization	90-day hospital readmission
ALL MEDICAID CLIENTS				
Community health center clients	Private fee-for-service provider clients	0.65***	0.68***	0.65***
SEX				
Female	Male	0.90***	0.67***	0.88
AGE, YEARS				
0–5	25–44	1.18***	0.71***	0.76***
6–17		1.28***	0.13***	0.50***
18–24		0.65***	0.09***	0.32***
45–64		1.15***	1.14***	0.54***
RESIDENCE				
Rural county	Urban county	1.20	0.44	5,395,443.47
DISABILITY STATUS				
Disabled	Not disabled	1.00	1.31***	0.21***

SOURCE Authors' analysis of Medicaid Management Information System data for Colorado, July 1, 2007–June 30, 2008. **NOTE** *p* values for odds that were not significantly different from 1 were all 0.43 or higher. ***$p < 0.01$

were reduced for the community health center clients, and this reduction was statistically significant (Exhibit 4; an expanded version of Exhibit 4 is available in the online Appendix).[13]

We found similar results for preventable hospital admission rates for acute conditions. Exhibit 2 shows unadjusted rates of 1,605 per 100,000 client-years for the community health center group, and 1,973 for the private provider group ($p = 0.12$). Being a community health center patient reduced the odds of experiencing a preventable hospital admission for an acute condition, and this reduction was statistically significant. The same pattern appeared in our results for preventable hospital admission rates for chronic conditions.

EXHIBIT 4

Adjusted Odds of Preventable Hospital Admissions Among Colorado Medicaid Clients, Fiscal Year 2008

Characteristic	Reference group	Preventable admission for acute condition	Preventable admission for chronic condition	Total preventable admissions
ALL MEDICAID CLIENTS				
Community health center clients	Private fee-for-service clients	0.66***	0.62***	0.64***
SEX				
Female	Male	0.85	0.79***	0.82
AGE, YEARS				
0–5	25–44	0.66***	0.35***	0.48***
6–17		0.00	0.00	0.00
18–24		0.00	0.00	0.00
45–64		0.32***	0.17***	0.23***
RESIDENCE				
Rural county	Urban county	1.01	1.01	1.01
DISABILITY STATUS				
Disabled	Not disabled	0.37***	0.32***	0.35***

SOURCE Authors' analysis of Medicaid Management Information System data for Colorado, July 1, 2007–June 30, 2008. **NOTE** All analyses used 95 percent confidence intervals and $p < 0.05$ for statistical significance. ***$p < 0.01$

Discussion And Policy Recommendations

Previous studies have found that users of community health centers are less likely than other Medicaid clients to have emergency department visits, inpatient hospitalizations, or preventable hospital admissions.[8–10] Other researchers have found, as we did, that unadjusted results typically indicate higher rates of use among clients of community health centers as a result of demographic and other characteristics.

However, after controlling for variables, we found that these results were reversed.[8] Making these logical statistical adjustments suggests that receiving routine care from community health centers reduces the likelihood that patients will receive additional care at more expensive hospital settings. And in fact, in our study, even when variables were not controlled for, Medicaid clients who received their usual care from community health centers had lower rates than other clients of preventable hospital admissions overall, as well as lower rates of admissions for acute conditions.

The general pattern of reversal after adjusting for variables is probably chiefly due to demographic differences between the two groups of clients. The community health center group appears to be composed of healthier clients, because it contains larger portions of women and of children in the youngest age group and a smaller portion of disabled people (Exhibit 1).

However, these demographic factors do not necessarily mean that the better outcomes of clients whose regular care comes from community health centers are unrelated to that source of care. As Exhibit 3 shows, the age groups 0–5 and 45–64 are more likely than other groups to have emergency department visits or inpatient hospitalizations, and both of these age groups make up a larger portion of the community health center clients than of the private provider clients (Exhibit 1). Equally, clients without disabilities are a larger portion of the community health center population but are more likely to experience a preventable hospital admission (Exhibit 4).

Sex and urbanicity do not appear to have as great an effect on the health outcomes we measured as we initially expected they would. The use patterns of the clients included in this study seem to indicate that conventional notions of which demographic categories will be the highest users of medical services may not apply to the Colorado Medicaid population in the same way that they apply to other non-Medicaid groups. Nonetheless, differences in the care each group received appears to drive differences in health outcomes. Our results are similar to those found in previous studies, which suggests that the routine care that community health centers provide does reduce the likelihood that patients will also receive care in more expensive hospital settings.

This study shows that there are differences in outcomes between fee-for-service provider types.

Public health insurance entities, such as state Children's Health Insurance Programs, Medicaid, and publicly funded clinics, and community health centers share the goal of providing a high level of care at an affordable cost. The evidence from Colorado shows that the centers do provide a level of office-based care that results in patients' being less likely to use the emergency department, be admitted to the hospital, be readmitted within ninety days of a previous hospitalization, or be admitted to the hospital for conditions that could be managed in an outpatient setting—all events associated with higher costs of care.

Colorado budget considerations and policy mandates in the past several years have moved the vast majority of the state's Medicaid clients out of mandatory managed care programs and into fee-for-service programs. This study shows that there are differences in outcomes between fee-for-service provider types. When government payers and community health centers share information such as the results of our study, they can discover areas of success and target other areas for improvement. ■

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Jennifer Rothkopf and coauthors demonstrate that Colorado Medicaid patients treated at federally qualified health centers had have fewer emergency room visits, hospitalizations, hospital readmissions, and preventable hospitalizations than their counterparts whose primary source of care was private, fee-for-service providers.

The findings of this month's article are consistent with results from similar studies, and they could inspire other states to make greater use of the centers, Rothkopf says.

Rothkopf is now a health specialist with the Peace Corps in Mongolia, having earned her master of public health (MPH) degree in behavioral sciences and health education from Emory University's Rollins School of Public Health in May 2011. At the time of the study, she was an MPH candidate and an intern at the Colorado Department of Health Care Policy and Financing.

While at Emory, she was a research assistant in the Department of Behavioral Sciences and Health Education, where she helped develop a website for use by people with epilepsy to manage their medications, stress, and sleep. She also helped teach history of public health and mental health and American culture courses at Rollins.

Rothkopf's research interests include program evaluation, mental health among refugees, access to health care, and using sustainable economic development to improve population health. She originally developed an interest in community health centers while working as an outreach worker to the homeless at a Denver clinic.

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