Children's Service Use During the Transition to PCCM in Two States

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This study examines whether use of primary, preventive, or emergency care changed as primary care case management (PCCM) programs for children were implemented in Alabama and Georgia. Using claims data we track the same children over time, and control for geographic availability of Medicaid providers, which also changed over this period. A decline in use of all three types of care was found to be associated with PCCM implementation, with use of primary and preventive care falling below national averages and recommended use rates. Family difficulties in shifting to exclusive use of unfamiliar providers is the primary reason for the decline in use rates.

BACKGROUND

PCCM is a form of managed care that links enrollees in an insurance program with a primary medical provider (PMP) who serves as first point of contact when the enrollee has health care needs. The PMP provides primary and preventive care for the individual, coordinates referrals for specialty and ancillary care, and usually authorizes the use of emergency department facilities, directing non-urgent care requests to office sites. PCCM programs were first introduced into State Medicaid Programs in the early 1980s (Hurley, Freund, and Paul, 1993) with the dual goals of improving access and quality of care for enrollees and reducing unnecessary expenditures for Medicaid Programs. In 2003, 16 States offered PCCM programs statewide to Medicaid enrollees, and an additional 13 States offered PCCM in selected geographic areas of States (Centers for Medicare & Medicaid Services, 2003).

In theory, PCCM arrangements should offer all of the advantages that individuals receive from having an identifiable usual source of care, including better access to services, less use of emergency departments, and more regular use of preventive care (Rowland et al., 1995; Xu, 2002). In practice, the measured impacts of implementing PCCM arrangements in Medicaid Programs are mixed. A summary of the evaluations of the early PCCM programs suggested that the most consistent effects were a decrease in the use of emergency departments, ancillary, and inpatient services (Hurley, Freund, and Paul, 1993). A decrease in emergency department use over time, or less use in areas where PCCM is in operation, continues to be documented as an effect in more recent evaluations (Smith, Des Jardins, and Peterson, 2000; Piehl, Clemens, and Joines, 2000; Zuckerman, Brennan, and Yemane, 2002)

In terms of the use of primary and preventive care, Hurley et al. (1993) reported that for the 12 best program assessments they reviewed, 3 reported increases in

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visits, 5 reported decreases, and 4 reported no change. Long and Coughlin (2001) report no difference in physician usage between fee-for-service (FFS) and managed care enrollees in rural Minnesota, but Schoenman et al. (1997) report an increase in primary care utilization after the implementation of PCCM in Maryland, and Zuckerman et al. (2002) report that analysis of national data indicate Medicaid covered children enrolled in PCCM programs have a greater likelihood of seeing a physician, but no greater likelihood of receiving preventive care, than Medicaid covered children in FFS programs.

At least two factors mediate the impact of PCCM (and managed care in general) on access to care for Medicaid enrollees. First, the implementation of PCCM may change the number and location of sites of primary care, causing them to become either more or less available to Medicaid enrollees. Elsewhere, we have shown that implementation of PCCM programs in Alabama and Georgia in the late 1990s was associated with reductions in the portion of physicians participating in Medicaid (Adams, Bronstein, and Florence, 2003), but an increase in the share of visits provided by community health centers (Florence, Bronstein, and Adams, 2002).

Second, low-income families may have difficulty adapting to the constraints of using a single assigned office-based physician to meet their health care needs. These families often have limited access to transportation, difficulty leaving other time commitments such as jobs to travel and wait for care, low literacy levels which make comprehension of the requirements for using a PCCM system difficult, and challenges communicating with physician offices (Pina, 1998; Hill, Zimmerman, and Fox, 2002). These factors may result in decreased use of care under PCCM programs, compared to use in Medicaid without PCCM arrangements.

This study tracks changes in the probability of any primary care visit for an illness, any visit for preventive services, any emergency care visits, and the number of primary care illness visits for children age 0-18, over 4-year Medicaid PCCM implementation periods in Alabama (1996-1999) and Georgia (1994-1997). By controlling for changes in the geographic availability of Medicaid participating providers, which may occur in association with PCCM implementation, and by comparing use among the same children over time, instead of comparing a cross section of the population before and after implementation, or comparing usage in communities with and without PCCM programs this study is able to distinguish the impact of PCCM arrangements from other changes over time or differences in patterns of care use across populations. We model the impact of PCCM in Georgia and Alabama separately in order to explore the extent to which there may be parallels in the impact of PCCM across different States.

In both Georgia and Alabama the PCCM program assigns children to individual primary medical providers, based in offices or community health centers, and reimburses these providers with a small monthly case management fee per assigned child. Enrollment is mandatory except for children in the foster care system. For some parts of the implementation period in both States, small geographic areas were included in single mandatory enrollment capitated managed care programs instead of the PCCM programs, but these arrangements were not maintained over time. Neither State increased other reimbursement rates for services during this period. Both States required referrals from PMPs for the reimbursement of non-emergency services, specialty care, and some preventive services provided by other physicians and facilities. Over time PMPs developed various

blanket referrals and agreements that allowed emergency departments in some locations to provide care after hours, and allowed health departments in some locations to provide early, periodic screening diagnosis, and treatment (EPSDT), and other prevention services without individualized referrals. While emergency departments have always been able to provide urgent care to PCCM enrollees as necessary without referrals from PMPs, the definition of urgent care in Medicaid managed care shifted following the passage of the 1997 Balanced Budget Act, which mandated the use of a prudent patient standard for determining urgency. The prudent patient standard allows coverage without referrals for emergency department use if a patient might reasonably think that the problem for which they were seeking care required immediate attention (Centers for Medicare & Medicaid Services, 1998).

For this study, we use fixed effects models that control for the individual child, and assess whether there were differences in the four care use measures for each child in quarters before and after the child's residential county was phased-in to the PCCM arrangements, controlling for provider availability, and continuity of Medicaid enrollment. To aid in the interpretation of the multivariate models, we also present findings from focus groups conducted in both States with Medicaid enrollees and Medicaid providers.

METHODS

Sources of Data

We used Medicaid enrollment data for children age 0-18 over 4-year periods in Alabama (1996-1999) and Georgia (1994-1997), to draw 25 percent samples in each State of children ever enrolled over the time period. We linked the identification numbers of these enrolled children to paid claims data for the period. We summarized claims for each quarter, but the first one, in order to count the number of visits the child made for different types of services in the quarter. A visit is defined as an encounter with a single provider on a single day in the quarter. Primary care was defined as visits that included claims with Current Procedural Terminology (CPT®) codes (American Medical Association, 2005) for evaluation and management in the office and inpatient settings. Preventive care was defined as visits that included claims with indicators for EPSDT services, diagnosis codes indicating well-child monitoring or contraceptive services, and procedures indicating preventive care services. Emergency visits were defined as those where claims included procedure codes for emergency department services. (Coding is available on request from the authors.) Visits with codes indicating a combination of primary, preventive, or emergency services were counted in each category. Children who were enrolled in Medicaid in the quarter, but who had no visits were given values of zero for the four care use measures. Children covered by capitated managed care arrangements during this time were excluded from the study sample.

We constructed three types of measures of Medicaid participating provider availability in the quarter: (1) whether or not a child had any of seven types of providers in their residential ZIP Code in a quarter seeing Medicaid patients, (2) the miles from the child's residential ZIP Code to the closest hospital, community health center, and large volume office physician seeing Medicaid patients, and (3) for the child's residential community, the ratio of large volume office physicians seeing Medicaid patients to the number of child Medicaid enrollees in the local physicians' market

area. Claims data from the preceding quarter were used to identify those providers of all types who were actually seeing (that is, billing for) Medicaid covered children in the quarter. We distinguished large and small office and hospital-based providers based on whether their Medicaid visit volume in the quarter exceeded 1 percent of the average visit volume for pediatric and general care providers in the Southeast region; the other three provider types included were hospitals, community health centers, and health departments. Residential communities were defined as the post office delivery name for the child's ZIP Code, and Atlanta and Birmingham, the two largest metropolitan areas in the two States, were divided into five and four subcommunities, respectively. Refer to Adams et al. (2003) for a discussion of the definition of small and large volume physicians, and the patient origin approach used to define the market area for providers in the community. Mileage for the shortest distances was calculated as the shortest point-to-point distance from the latitude and longitude of the center of each residential ZIP Code to the center of the community (post office delivery name) where an active Medicaid provider was located.

Medicaid eligibility files for the sample children were used to construct three measures of Medicaid enrollment: (1) cumulative months of Medicaid enrollment, (2) a marker for whether the child was newly enrolled in Medicaid in the quarter, and (3) the number of months within the quarter that the child was enrolled in the program. This last variable was used in some regression models to control for exposure to Medicaid when examining the number of visits a child made in the quarter.

Birth date, ZIP Code of residence, and type of eligibility for Medicaid were also collected from Medicaid files. County of residence was taken from the eligibility and claims files. These county fields were used to designate whether the child was included in the PCCM program in any given quarter, and whether this quarter was the first quarter in which the county of residence was included in PCCM. County fields were also used to mark whether or not the child resided in a metropolitan area.

Finally, census data estimated at the ZIP Code level by Consolidated Analysis Centers, Inc. of Arlington, Virginia, and projected for each year of the study from the 1990 Census, were linked to each child's residential ZIP Code in the quarter. Census variables included the percent of the population in the ZIP Code that was Black, the percentage with household incomes less than $15,000, the total population of the ZIP Code, and the population under age 18.

Enrollee focus group data were gathered from six focus groups held with Medicaid enrollees in Alabama communities, and six focus groups held with Medicaid enrollees in Georgia communities, all during spring 2001. The 12 communities were selected to represent a range of rural and urban locations geographically dispersed across the two States. Parents were selected at random from Medicaid enrolled families in the 12 counties, and invited to attend the focus groups. No attempt was made to match the demographics of the enrollee population in the area to the demographics of the focus groups. Each enrollee focus group had approximately 10 participants and lasted about 2 hours. In the focus groups, enrollees described their experiences with Medicaid, with use of primary and specialty physician, and with emergency department services.

Provider focus group data were gathered in Alabama from a focus group of pediatricians, a group of public health district administrators, and a group of directors of community health centers. In Georgia, provider focus group data were

gathered from groups of pediatricians, rural-based family physicians, urban-based family physicians, and public health department clinic managers. In all cases, these focus groups were held in conjunction with statewide meetings of these professionals, and providers were recruited on a volunteer basis. In these focus groups, providers described their experiences with the Medicaid Program, their experiences treating Medicaid-covered patients, and their experiences and evaluations of the PCCM programs within their States. Georgia Health Decisions, Inc. of Atlanta, Georgia, recruited for all of the focus groups except those of the Alabama providers; the latter groups were recruited by the Center for Community Health Resource Development at the University of Alabama at Birmingham, School of Public Health. Georgia Health Decisions, Inc. moderated all of the focus groups, and prepared summaries of the verbatim focus group transcripts.

Analytic Approach

With claims data, we used fixed-effects models, using a unique child identification number to control for unobserved and time invariant child characteristics (e.g., including race or ethnicity of the child and eligibility category, unless data showed that eligibility category changed over time). Quarterly dummies were also included to control for unobserved factors related to time. Logit models were estimated on the use/non-use of any primary care visit, and any preventive care visit in the quarter. The number of primary care visits in a quarter was modeled as an ordinary least squares regression (OLS), with the number of visits expressed in log form, conditional on the child having had at least one visit.

For focus group data, we examined the summaries of the focus groups for documentation of enrollee and provider perceptions of key aspects of the PCCM programs, including assignment of PMPs, and use of well-child care and emergency department care. Direct quotes from focus group participants are paraphrased for this presentation.

Findings

Descriptive Data

Table 1 compares the demographic composition of the two States' 25 percent Medicaid samples, at the beginning and at the end of the PCCM implementation for each State. Both States had a larger proportion of covered children who were newly enrolled in the last year compared to the first year. Both States had an increase in the portion of children who were income eligible rather than income supported over the time period, which overlapped with welfare reform. Still, over the whole time period, Georgia had more children in the population who were income supported, compared to Alabama, undoubtedly because the income threshold for income support in Georgia was 39 percent of the Federal poverty level (FPL) compared to 15 percent of the FPL in Alabama over this period (King and Christian, 1996).

Table 2 shows the measures of primary and preventive care use, provider availability and features of enrollment in the first and last years of the study periods in each State. Alabama had a rapid increase in the portion of children covered by PCCM over the period; PCCM implementation in Georgia was much more gradual. In both States there was a decline in the portion of children with any primary and preventive care visits over the PCCM implementation period. In terms of provider availability, both States experienced a decline in the mean number of large volume active Medicaid office providers per enrollee within communities, and a decline in the portion of children living in ZIP Codes with

Table 1

Demographic Features of Study Sample of Children Enrolled in Medicaid: 1994-1999

	Sample States			
	Alabama		Georgia	
Demographic	1996	1999	1994	1997
Number Enrolled	92,051	86,492	109,333	165,468
	Percent			
Age				
0-5 Years	52.0	45.2	48.3	46.8
6-11 Years	31.0	32.8	30.8	30.2
12-18 Years	17.0	21.9	20.8	23.0
Race/Ethnicity				
Black	53.8	55.5	66.0	57.5
White + Other	45.2	42.9	32.3	39.0
Hispanic	1.0	1.5	1.6	3.5
Eligibility				
Income Support	27.3	21.1	58.0	43.1
Income Eligible	56.5	69.4	34.6	51.6
SSI Eligible	9.5	8.6	5.4	3.5
Foster[1]	1.1	0.7	2.0	1.4
Other[2]	5.6	0.3	0.1	0.4
Live in MSA	58.2	55.6	60.8	62.7
Newly Enrolled During the Year	13.7	33.3	14.5	20.8

[1] Automatically eligible for Medicaid due to placement in foster care system.

[2] Includes additional small eligibility categories such as medically needy and status as refugee.

NOTES: SSI is Supplemental Security Income. MSA is metropolitan statistical area.

SOURCE: Centers for Medicare & Medicaid Services: Medicaid enrollment data, 1994-1999.

large volume active Medicaid hospital-based physician practices. In Alabama, geographic proximity to active Medicaid participating hospitals, large and small volume office physicians, and small volume hospital physicians also decreased. In both States, geographic proximity to community health centers and to health departments increased. These changes in provider availability were due for the most part to changes in the Medicaid billing activity of local providers (that is, many decreased their patient volumes or left the program over the PCCM implementation period), although there was also an expansion in the number of sites operated by community health centers and health departments over this period, particularly in Alabama.

Multivariate Analysis of Claims Data

Tables 3–5 present the results of fixed effects time series logistic regressions assessing the likelihood of individual children having a primary care, preventive care or emergency care visit in any quarter of the study period, given whether or not they are in the PCCM program, geographic provider availability in the quarter, and the length of their own enrollment in Medicaid (counting from the first quarter of the time period). Because the provider availability measures are lagged one quarter, the regressions exclude measurements of the first quarter of the time period. In both States, controlling for other factors, PCCM enrollment was associated with a lower likelihood of a child having any of these three types of visits. For primary illness care in both States and preventive care in Alabama, likelihood of use was higher in the county's first quarter in the program, compared to later quarters, but for preventive care in Georgia and emergency care in both States, likelihood of use was even lower in the first quarter of PCCM implementation than later.

Table 2

Children's Enrollment, Care Use, and Geographic Provider Availability: 1994-1999

Description	Sample States			
	Alabama		Georgia	
	Annualized 1996	Annualized 1999	Annualized 1994	Annualized 1997
	Percent			
Enrollment				
First Quarter of PCCM	0	28.1	1.4	20.8
Total with PCCM	0	100.0	10.3	82.6
Utilization				
Primary Care Visit	48.5	43.3	69.0	65.0
Preventive Care Visit	54.7	38.8	46.9	44.1
Emergency Care Visit	28.2	16.5	17.4	7.5
Mean Primary Care Visits for Those with Any Primary Care Visit	4.3 (4.2)	3.4 (3.6)	4.1 (4.2)	4.1 (4.0)
Provider Availability				
Any Large Volume Office Active Medicaid MD in ZIP Code	69.3	60.0	84.4	84.9
Mean Miles to Large Volume Office Active Medicaid MD if Not in ZIP Code	8.9 (4.3)	8.3 (4.8)	7.2 (3.6)	7.5 (3.8)
Any Active Medicaid Community Health Center in ZIP Code	17.2	33.3	13.7	17.8
Mean Miles to Active Medicaid Community Health Center if Not in ZIP Code	16.9 (9.3)	11.1 (6.6)	21.2 (16.2)	16.5 (11.8)
Large Volume Active Medicaid Hospital MD in ZIP Code	44.6	32.9	51.9	47.1
Active Medicaid Hospital in ZIP Code	35.9	31.0	38.3	42.0
Active Medicaid Health Department in ZIP Code	7.5	31.0	37.9	41.0
Small Volume Office Active Medicaid MD in ZIP Code	60.2	56.3	73.0	80.6
Small Volume Active Medicaid Hospital MD in ZIP Code	42.2	39.3	60.7	61.0
Mean Large Volume Office Active Medicaid MD to Enrollee Ratio in Residential Community	15.4 (16.5)	12.0 (12.3)	12.8 (13.6)	11.3 (10.5)

NOTES: PCCM is primary care case management. Numbers in parentheses are standard deviation. MD is medical doctor.

SOURCE: Centers for Medicare & Medicaid Services: Medicaid paid claims data, 1994-1999.

Provider availability measures show a small, but significant impact on utilization in both States. All three types of service use in Alabama and primary care use in Georgia were more likely to occur in communities with higher Medicaid physician to enrollee ratios. In addition, primary care visits were more likely to occur in Alabama the closer a child lived to a high volume office physician, and in Georgia, for children in ZIP Codes with high volume hospital-based practices. In both States, emergency care visits were more likely to occur when children had high volume hospital-based practices in their ZIP Codes. Note that Table 2 showed that all of these providers became less available to children over the PCCM implementation period. While proximity to community health centers increased over the period, this measure was not significantly associated with likelihood of service use. The confidence intervals for the mileage-based measures are extremely small, due to the large sample size and the precision of the mileage estimate.

Children in their first quarter of Medicaid enrollment were markedly less likely to have a primary care visit, a preventive care visit or, in Alabama, an emergency care visit. Long-term enrollment had a small negative effect on primary illness care use in both States, on preventive care use in Georgia and on emergency care use in Alabama.

Table 6 shows the results of the OLS regression for the number of primary care visits a child made within a quarter, given that he or she had any visits. Again in both

Table 3

Factors Associated With Children's Likelihood of a Primary Care Visit[1] Over the PCCM Implementation Period: 1994-1999

Description	Sample States			
	Alabama		Georgia	
	Odds Ratio	95% Confidence Intervals	Odds Ratio	95% Confidence Intervals
PCCM				
County Included This Quarter	***0.88	0.86, 0.89	***0.91	0.90, 0.93
County's First Quarter of PCCM	**1.07	1.03, 1.12	***1.11	1.08, 1.14
Provider Availability				
Distance to Hospital	***1.02	1.01, 1.03	1.00	0.99, 1.01
Distance to Hospital Squared	***0.99	0.99, 0.99	1.00	1.00, 1.00
Distance to Community Health Center	0.98	0.99, 1.00	1.00	1.00, 1.00
Distance to Community Health Center Squared	**1.00	1.00, 1.00	1.00	1.00, 1.00
Distance to High Volume Office MD	*0.99	0.98, 1.00	1.00	0.98, 1.01
Distance to High Volume Office Squared	*1.00	1.00, 1.00	1.00	1.00, 1.00
Presence Low Volume Office MD	1.03	1.00, 1.06	0.99	0.96, 1.01
Presence Low Volume Hospital MD	0.98	0.95, 1.01	1.02	1.00, 1.04
Presence Health Department	0.98	0.94, 1.02	0.98	0.94, 1.02
Presence High Volume Hospital MD	1.00	0.96, 1.03	*1.05	1.02, 1.07
Ratio High Volume Office MD to Enrollees	***1.01	1.01, 1.02	*1.00	1.00, 1.00
Enrollment				
First Quarter of Enrollment	***0.52	0.50, 0.54	***0.44	0.42, 0.46
Number Months Enrolled	***0.99	0.98, 0.99	***0.99	0.99, 0.99

* $p < 0.05$.

** $p < 0.01$.

*** $p < 0.001$.

[1] Fixed effects logistic regression, controlling for urban residence and eligibility category (where these varied for individuals over time), and controlling for child's age, population size, percent of individuals with incomes < $15,000, Black, population under age 18, in the residential ZIP Code, and time period.

NOTES: PCCM is primary care case management. MD is medical doctor.

SOURCE: Centers for Medicare & Medicaid Services: Medicaid enrollment, claims, and census data, 1994-1999.

States, enrollment in PCCM was associated with a lower number of visits made in the quarter. In both States, children in communities with more large volume office physicians per enrollee made more visits. Enrollment features were not associated with the number of primary care illness visits made in the quarter in Alabama, but in Georgia, those who had been enrolled for longer periods, made fewer visits.

Focus Group Data

All of the focus groups were conducted in 2001, well after the time period studied with claims data, so that enrollees and providers described their current experiences with the PCCM programs, as well as their experiences when they first entered the programs. Providers in focus groups for the most part endorsed the concept of children having a medical home, or a continuous relationship with a physician, but felt that there were many problems with implementing this system through the Medicaid Program. Public health department providers in both States were the least supportive of the concept of PCCM, and cited two drawbacks to the new systems. First, they felt that office physicians were generally too busy and too acute care oriented to focus on the provision of preventive care, and that families also were unlikely to seek out preventive care on their own. Consequently, they felt that well-child visits and vaccination rates were declining under PCCM. Second, they felt that it was preferable to provide health

Table 4

Factors Associated With Children's Likelihood of a Preventive Care Visit Over the PCCM Implementation Period:[1] 1994-1999

	Sample States			
	Alabama		Georgia	
Description	Odds Ratio	95% Confidence Intervals	Odds Ratio	95% Confidence Intervals
PCCM				
County Included This Quarter	***0.94	0.92, 0.96	***0.92	0.90, 0.94
County's First Quarter of PCCM	**1.07	1.03, 1.12	**0.94	0.91, 0.97
Provider Availability				
Distance to Hospital	1.01	1.00, 1.02	**0.98	0.97, 0.99
Distance to Hospital Squared	1.00	1.00, 1.00	1.00	1.00, 1.00
Distance to Community Health Center	1.00	0.99, 1.00	**0.99	0.99, 1.00
Distance to Community Health Center Squared	**1.00	1.00, 1.00	***1.00	1.00, 1.00
Distance to High Volume Office MD	1.00	0.99, 1.01	0.98	0.97, 1.00
Distance to High Volume Office Squared	1.00	1.00, 1.00	**1.00	1.00, 1.00
Presence Low Volume Office MD	0.99	0.96, 1.02	1.02	0.99, 1.05
Presence Low Volume Hospital MD	1.02	0.99, 1.05	***0.93	0.91, 0.96
Presence Health Department	1.02	0.98, 1.07	**0.91	0.86, 0.97
Presence High Volume Hospital MD	1.03	0.99, 1.07	***1.08	1.05, 1.12
Ratio High Volume Office MD to Enrollees	***1.01	1.01, 1.02	***0.99	0.99, 1.00
Enrollment				
First Quarter	***0.65	0.62, 0.68	***0.49	0.46, 0.52
Number Months Enrolled	0.99	0.99, 1.00	***0.98	0.98, 0.99

** $p < 0.01$.

*** $p < 0.001$.

[1] Fixed effects logistic regression, controlling for urban residence and eligibility category (where these varied for individuals over time), and controlling for child's age, population size, percent of individuals with incomes < $15,000, Black, population under age 18, in the residential ZIP Code.

NOTES: PCCM is primary care case management. MD is medical doctor.

SOURCE: Centers for Medicare & Medicaid Services: Medicaid enrollment, claims, and census data, 1994-1999.

services to families whenever they saw them, rather than expecting families to be able to get to a specific place at a specific time. In some focus groups, described their willingness to see ill patients presenting at their clinic and forego reimbursement because they felt they would be unable to get a referral from a PMP.

Medicaid enrolled families in Alabama were generally positive about the idea of the same physician or physician group seeing their children consistently, since the physician would know the child's history and would also be familiar with which medications were covered by the Medicaid Program. However, they did not feel strongly about the issue. Some focus group participants in Georgia reported resenting being restricted in their choice of physician at any given time, and expressed a preference for choosing where they went, or for taking their child to a hospital-based clinic instead of a private physician. Participants in both States reported receiving Medicaid cards with assigned physicians on them, rather than being asked to choose a physician. Many were unaware that they could change their assigned physician, and others had attempted to change their assigned physician, but found it difficult to do so. Many participants left it up to the providers to arrange for approval to bill for services, and few expressed concern that they were using physicians who were not assigned to them as PMPs. However, some participants stated that they no longer took their children to the physician because they were not familiar

Table 5

Factors Associated With Children's Likelihood of an Emergency Department Services Visit Over the PCCM Implementation Period:[1] 1994-1999

	Sample States			
	Alabama		Georgia	
Description	Odds Ratio	95 % Confidence Intervals	Odds Ratio	95 % Confidence Intervals
PCCM				
County Included This Quarter	***0.96	0.94, 0.98	***0.51	0.49, 0.53
County's First Quarter of PCCM	***0.83	0.79, 0.88	*0.95	0.91, 0.99
Provider Availability				
Distance to Hospital	1.00	1.00, 1.02	0.99	0.97, 1.00
Distance to Hospital Squared	1.00	1.00, 1.00	1.00	1.00, 1.00
Distance to Community Health Center	*1.00	1.00, 1.01	1.00	1.00, 1.00
Distance to Community Health Center Squared	1.00	1.00, 1.00	1.00	1.00, 1.00
Distance to High Volume Office MD	***1.02	1.01, 1.03	1.00	0.98, 1.03
Distance to High Volume Office Squared	***1.00	1.00, 1.00	1.00	1.00, 1.00
Presence Low Volume Office MD	1.03	0.99, 1.07	0.99	0.96, 1.03
Presence Low Volume Hospital MD	1.03	0.99, 1.07	0.99	0.96, 1.02
Presence Health Department	**1.07	1.02, 1.13	**0.88	0.81, 0.94
Presence High Volume Hospital MD	***1.11	1.06, 1.16	***1.17	1.12, 1.22
Ratio High Volume Office MD to Enrollees	***1.02	1.01, 1.02	**1.00	0.99, 1.00
Enrollment				
First Quarter of Enrollment	***0.60	0.58, 0.63	1.06	0.99, 1.15
Number Months Enrolled	***0.98	0.98, 0.99	0.99	0.99, 1.00

*$p < 0.05$.

** $p < 0.01$.

*** $p < 0.001$.

[1] Fixed effects logistic regression, controlling for urban residence and eligibility category (where these varied for individuals over time), and controlling for child's age, population size, percent of individuals with incomes < $15,000, Black, and population under age 18, in the residential ZIP Code.

NOTES: PCCM is primary care case management. MD is medical doctor.

SOURCE: Centers for Medicare & Medicaid Services: Medicaid enrollment, claims, and census data, 1994-1999.

with the physician who had been assigned to them by Medicaid.

Providers in both States agreed that most families did not really understand the restrictions of the PCCM system. They felt they were in the position of having to explain how the system worked. They were often asked to provide their numbers (i.e., authorize referrals) to other physicians when their assigned patients were being seen in other settings. They agreed that assignment of patients to primary care providers seemed random; patients were assigned to physicians they did not know who were located in communities that were hard for them to reach. They also agreed that they had children assigned to their practices whom they had never seen, and that some families had stopped using physician care because they were unfamiliar with their assigned physician.

In both States, families of Medicaid enrollees reported not receiving or not being able to understand any printed material received from the Medicaid Program, and thus discovering though trial and error which services are covered and what the rules are for using services. Also in both States, families were ambivalent about the need to take children to physicians for well-child care, but were clear about their preference to use hospital emergency departments if they felt their child had an emergency, or if they could not be seen immediately in physician offices when their child had a fever or other illness. From their experiences, the PCCM systems had not radically changed their use of emergency

Table 6

Factors Associated With the Number of Primary Care Visits Made by Children With Any Primary Care Visits:[1] 1994-1999

Description	Sample States			
	Alabama		Georgia	
	Coefficient	*t*-statistic	Coefficient	*t*-statistic
PCCM				
County Included This Quarter	**-0.018	-2.86	**-0.013	-2.79
County's First Quarter of PCCM	0.004	0.41	-0.002	0.77
Provider Availability				
Distance to Hospital	0.001	0.27	-0.000	-0.29
Distance to Hospital Squared	-0.000	-0.55	0.000	0.65
Distance to Community Health Center	-0.001	-0.75	-0.000	-0.31
Distance to Community Health Center Squared	0.000	0.32	0.000	0.10
Distance to High Volume Office MD	*0.006	2.09	-0.006	-1.78
Distance to High Volume Office Squared	-0.000	-1.77	0.000	1.70
Presence Low Volume Office MD	-0.011	-1.30	-0.001	-0.24
Presence Low Volume Hospital MD	0.016	1.77	0.005	1.20
Presence Health Department	*-0.026	-2.12	0.007	0.61
Presence High Volume Hospital MD	-0.000	-0.01	*0.012	2.05
Ratio High Volume Office MD to Enrollees	***0.003	4.36	*0.001	2.34
Enrollment				
First Quarter of Enrollment	-0.005	-0.31	-0.017	-1.30
Number Months Enrolled	-0.002	-1.13	***-0.003	-4.14

* $p < 0.05$.

** $p < 0.01$.

*** $p < 0.001$.

[1] Ordinary Least Squares Regression (OLS) on log of visits, controlling for urban residence and eligibility category (where these varied for individuals over time), and controlling for child's age, population size, percent of individuals with incomes < $15,000, Black, population under age 18, in the residential ZIP Code, time period and number of months within the quarter that the child was enrolled.

NOTES: PCCM is primary care case management. MD is medical doctor.

SOURCE: Centers for Medicare & Medicaid Services: Medicaid enrollment, claims, and census data, 1994-1999.

department services; they still used these services even when their physicians advised other treatments over the telephone and they ignored bills from the hospital because they expected Medicaid to cover the services.

Providers agreed that Medicaid covered families made frequent use of emergency departments. They also felt that referral requirements and other restrictions had not been effective in reducing this use. Still, most felt that strict enforcement of the referral requirements and payment rules, refusing to see patients who were not assigned to them and refusing to provide referrals when patients used other providers, was the only way to enforce the PCCM system. They hoped that the Medicaid Program could find a way to effectively educate families on use of the PCCM systems.

DISCUSSION

The purpose of this study was to examine more precisely the impact of PCCM on children's utilization in health care by controlling for potentially confounding factors such as simultaneous improvements or declines in geographic provider availability, other uncontrolled time trends or long standing differences in communities with and without PCCM programs. We accomplished this by using a model that examined changes in an individual's use of care over time, controlling for whether they

were or were not in a PCCM program and taking changes in provider availability into account.

In accord with other studies of PCCM programs, previously cited, we found a decline in use of emergency department services in both States that was associated with a child's residential county entry into PCCM. The effect of PCCM on emergency department use in Georgia in 1994-1997 was much more negative than the effect of PCCM on emergency use in Alabama 1996-1999, possibly because of the prudent patient modifications in the requirements for emergency referrals implemented in the late 1990s, which liberalized criteria for treating patients in emergency departments. It was interesting to note that, although data in the multivariate analysis from the PCCM implementation period clearly showed a decline in use of emergency services associated with PCCM, providers and enrollees in interviews conducted in both States a few years later describe continued use and preference for use of these services.

We also found a decline in primary care visit rates in both States with PCCM implementation. Given that the initial rates of use of primary care in the States were not that high, 48.5 percent in Alabama and 69.0 percent in Georgia compared to 66.3 percent reported by Elixhauser et al. (2002) for publicly insured children nationally in the 2002 Medical Expenditure Panel Survey, the decline in use of primary care with PCCM suggests the presence of new difficulties faced by families gaining access to primary care physicians, rather than a reduction in use of unnecessary primary care visits. In both States, there was an initial increase in primary care visits in the first quarter that PCCM was implemented in a county, but not in the first quarter that a child was enrolled. This suggests that participating primary care physicians may have made an initial attempt to contact assigned patients when the PCCM program began, but were not able to sustain high levels of primary care utilization.

Finally, this study also documented a decline in the likelihood of a child having a preventive care visit after PCCM implementation. This is distressing, but not surprising, considering that the system directs children away from public health departments, who have been major providers of EPSDT, and preventive care in these States traditionally. It is possible that office-based primary care physicians continue to provide preventive services, but do not submit claims with explicit coding for preventive care. However, there is no complementary increase in primary care visit use rates that would suggest a direct substitution of primary care for preventive care

An important limitation of this study is that the utilization measures reported here in the descriptive and multivariate analyses are based on paid claims data. Visits to physicians that were not reimbursed by Medicaid are not captured in these data. If many providers continued to see children after PCCM implementation, but did not submit claims or were not reimbursed because they did not have the proper authorization, the utilization rates reported here for the post-PCCM period may be understated. Also as noted, preventive care use could appear misleadingly low if providers did not use well-child diagnoses or bill for an identified set of EPSDT services. Finally, we included the small number of children covered by Medicaid through foster care eligibility in the study sample, although enrollment in the PCCM programs was not mandatory for this group. Eligibility category was not retained in the multivariate analysis for the Georgia models, because

the designation was collinear to the child's identification number. Eligibility category was retained in the Alabama models, because there was some change in categories for the same children over time. In those analyses, foster care eligibility was associated with a greater likelihood of use of preventive and primary care, but no difference in use of emergency care or number of primary care visits, compared to children with Medicaid eligibility through income support programs. This suggests that the presence of PCCM in a county may have had less negative effect on children in foster care, and the overall effect of PCCM may have been even more negative than shown in these analyses, had foster care covered children been excluded from the sample.

In summary, the literature evaluating PCCM programs does not show a consistent positive effect of assigning a primary care provider to each patient on access to and utilization of general primary and preventive care, but does show, for the most part, a negative impact on use of emergency department care. Our study supports these findings. At least in the initial implementation years of PCCM in Alabama and Georgia, use rates for primary, preventive and emergency department services all declined. While some of the decline could be attributed to a concomitant decline in the geographic availability of physician services, PCCM was associated with a decline in utilization even when provider availability was controlled for. Focus group interviews with enrollees and providers point to the difficulties families had understanding and adjusting to restrictions on the providers that they are authorized to use for routine care as the likely basis for decline in use.

It is possible that, as the PCCM programs mature, providers and enrollees will adjust to the system, and care use rates will increase. Certainly very active attempts to communicate the PCCM system to enrollees, to link primary medical providers successfully to families and to provide accessible alternatives to hospital emergency departments for conditions that families perceive to be urgent are all necessary to achieve improvements in access to care in Medicaid through the PCCM mechanism.

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