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Pregnancy and Delivery Costs in Georgia Medicaid: PCCM Versus Fee-for-Service Enrollees

Pregnancy and Delivery Costs in Georgia Medicaid: PCCM versus Fee-for-Service Enrollees[4]

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Abstract

This study examines the enrollment, resource utilization, and prenatal care cost patterns among pregnant black and white women in Georgia's PCCM program, Georgia Better Health Care (GBHC), compared with those acquiring pregnancy and delivery services through Georgia's Fee for Service (FFS) sector. Birth certificate data from 1998 were linked with Medicaid enrollment and claims data from 1997 and 1998 to construct a retrospective pregnancy history for each Medicaid woman giving birth in Georgia hospitals in 1998. Total payments for pregnancy and delivery services and on the total number of prenatal care visits were derived for each woman in the sample. Multivariate logistic analyses were employed to assess the role of PCCM versus FFS in determining total payments and the likelihood of a prenatal hospitalization, length of hospital stay longer than 2 days following delivery, and cesarean section delivery. While prenatal pregnancy services and delivery costs were higher for those in PCCM than FFS, PCCM women had fewer prenatal care visits and were less likely to have delivery stays longer than 2 days postpartum compared with FFS women. The higher costs under PCCM are apparently related to the finding that this delivery system was highly associated with having more prenatal hospitalizations compared with FFS. In similar analyses conducted separately for white and black pregnant women, black women served by PCCM followed these overall results across delivery systems while there were no differences in the likelihood of a prenatal hospitalization or total prenatal care visits for whites served by PCCM versus FFS. In light of Georgia's turn toward full capitation under its new managed care initiative, many issues regarding pregnancy services and delivery such as earlier program enrollment, coordination of care, payment policies and capitation rates will need to be addressed.

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Pregnancy and Delivery Costs in Georgia Medicaid: PCCM versus Fee-for-Service Enrollees

Primary care case management (PCCM) is a form of managed care that links enrollees in an insurance program with a primary care provider (PCP) who serves as first point of contact when the enrollee has health care needs. The PCP is contracted with to provide primary and preventive care for the individual, coordinate referrals for specialty and ancillary care, and usually, to authorize the use of emergency department facilities and direct non-urgent care requests to office sites. PCCM programs were first introduced into state Medicaid programs in the early 1980's (Hurley, Freund & Paul, 1993) with the dual goals of improving access and quality of care for enrollees and reducing unnecessary expenditures for Medicaid programs.

PCCM is not the dominant form of Medicaid managed care nationwide. While approximately 58% of all enrollees are in some form of managed care, only 23% of these are enrolled in PCCM (Kaye, 2005). Still, over half of the States (29 out of 50) use PCCM as a part of their overall managed care program. Regardless of the form states use, more than half make special arrangements for maternity-related expenses (Holahan, Rangarajan & Schirmer, 1999). Some make lump-sum payments, while others transfer maternity expenses into infant rates; some states pay a substantially higher rate for poverty-related eligible women (Holahan et al., 1999).

In Georgia, the focus state of this study, special arrangements for pregnant women under PCCM were made. Those eligible under the poverty-related expansions (up to 235% at time of study), or the Right From the Start Moms (RFTSM) in Georgia, could enroll in PCCM on a voluntary basis, while those eligible under welfare-related or disability eligibility criteria were mandated to participate as PCCM phased in over the 1994-1997 time period. Women in either group, however, could choose an Obstetrician / Gynecologist as their PCP rather than receive one assigned to them through the system. It was hypothesized however, that along with these program features, marked differences in the characteristics of women served by the fee-for-service (FFS) and PCCM delivery sectors in Georgia's Medicaid system would be revealed. For example, welfare-eligible women are lower income, single and more likely to be enrolled prior to pregnancy than the Right from the Start Medicaid mothers (RFTSMs).

While the effects of PCCM in Georgia on physician participation and children's use of services has been examined (Adams, Bronstein, & Florence, 2003; Bronstein, Adams, & Florence, 2005), little is known about the enrollment and resource utilization patterns of pregnant women in Georgia's PCCM program. In the current study, 1998 data are used to examine:

- How different the characteristics of pregnant women enrolled in FFS versus PCCM are in Georgia's Medicaid program?
- After adjusting for these characteristics, are there differences in the service utilization patterns of women served in the two sectors?
- Do these differences result in lower costs in the PCCM versus FFS sector?
- Is there evidence of racial disparities in costs due to length of stay and prenatal hospitalization served by PCCM and FFS?

As states continue to move from PCCM into stronger forms of Medicaid managed care, it is important to understand how PCCM performs relative to FFS. It is especially important to understand how states' policies regarding

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pregnant women have interacted with this form of managed care and what this means for a state like Georgia which is now moving into a capitated form of Medicaid managed care.

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, Rosenbaum, Simon, & Chait, 1995; Xu, 2002). In practice, the measured impacts of implementing PCCM arrangements in Medicaid programs are mixed. A summary of early evaluations of PCCM suggested that the most consistent effects were a decrease in emergency department use, and ancillary and inpatient services (Hurley et al., 1993, chap. 6). 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 recent evaluations (Smith, Des Jardin, & Peterson, 2000; Piehl, Clemens, & Joins, 2000; Zuckerman, Brennan, & 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 visits, 5 reported decreases, and 4 reported no change. Long and Coughlin (2001) reported no difference in physician usage between those in FFS versus managed care, but Schoenman, Evans and Schur (1997) reported an increase in primary care utilization after the implementation of PCCM in Maryland. Using national data, Zuckerman, Brennan and Yemane (2002) reported that Medicaid covered children enrolled in PCCM programs had a greater likelihood of seeing a physician, but no greater likelihood of receiving preventive care than those Medicaid covered children enrolled in FFS.

Only a few studies have actually examined the impact of PCCM on provider networks. One study, specific to the implementation of PCCM in Georgia and Alabama, found that there were associated declines in the proportion of participating physicians, reductions in small Medicaid practices, and declines in Medicaid visit volume among those still participating (Adams, et al., 2003). After following the same children over time as PCCM was implemented, an associated decline not only in emergency room use, but also in primary and preventive care was found in this study (Adams, et al., 2003). These results indicate that the PCCM delivery system may not have been able to better manage the care of pregnant women in Georgia.

There have been relatively few studies which have looked at the impact of Medicaid managed care specific to pregnant women. One study of mandatory Medicaid HMO care in Missouri conducted by Sommers, Kenney, and Dubay (2005) found that managed care counties showed relatively smaller increases in prenatal care and use of WIC, but a larger decrease in smoking than FFS counties. In another study, the move from voluntary to mandatory HMO enrollment for pregnant women in Ohio found mandatory enrollment had positive effects on both prenatal care and reductions in smoking, but no effect on birth weight (Howell, Dubay, Kenney, & Sommers, 2004. A study specific to PCCM also found that while there was a general upward trend in levels of prenatal care use, women in Iowa counties still served by FFS experienced a more dramatic improvement than those in counties serving women through PCCM (Schulman, Sheriff, & Momany, 1997). While there was no association of PCCM with improved birth outcomes, the lack of controls for certain baseline medical and social risk factors could have affected this comparison, e.g., women in PCCM were in more urbanized county areas (Schulman et al.., 1997).

The present study adds to this body of literature by examining PCCM and pregnant women in Georgia, a southern state in which Medicaid pays for

approximately 45% of all births. While a pre-post analysis was not able to be completed as in these earlier studies of PCCM, this study does provide significant new information on the differences in caseloads and costs that can occur under state policies which make PCCM mandatory for pregnant women in the lowest-income strata, but voluntary for higher-income women.

METHODOLOGY

A retrospective cohort study design was employed to examine the relationship between enrollment in either PCCM or fee-for-service (FFS) within Georgia Medicaid on the total costs of prenatal care and delivery, and several utilization measures (i.e., length of stay following delivery, number of prenatal visits, prenatal hospitalization, and cesarean section delivery) that affect total costs.

The data employed in the current study were actually part of a larger investigation that funded the time and effort needed to link three separate data sources. An outside vendor, Medstat, Inc., was paid to link the birth certificate and Medicaid enrollment data for 1998. Deterministic matching based on social security number was used yielding a 99% match rate. Claims data for 1997 and 1998 were then linked back to the birth certificate/enrollment file to achieve a retrospective pregnancy history for each Medicaid woman giving birth in a Georgia hospital during 1998. Each woman's outpatient and inpatient claims were then linked to her birth certificate/enrollment record to provide full information on prenatal and delivery experiences and costs while Medicaid enrolled. This linkage covered the period from delivery date back to conception. Medicaid enrollment data for both years were used to identify those pregnant women with continuous enrollment during their pregnancy. Due to the lag in obtaining complete claims data, especially those linked to birth certificate data, Georgia birth certificate data along with Medicaid outpatient and inpatient claims data for 1997-1998 were the latest available for the study. By linking birth certificate data to Medical enrollment and claims data, a comprehensive pregnancy history dataset was created thus, providing a unique way to explore the past performance of PCCM.

The study subjects were Medicaid pregnant women, categorized into 3 age groups (10-17, 18-34, or 35 years old or older) who delivered a singleton live birth without congenital abnormalities in a Georgia hospital during the year 1998. The main exposure variable of interest was the Medicaid delivery system for prenatal and delivery care, either PCCM or FFS. Women who delivered in 1998 were retrospectively followed over their entire prenatal period through Medicaid claims and birth certificate data to assess outcomes in the FFS versus PCCM sectors. Only those women who spent their full time in Medicaid in their respective delivery sector, regardless of the length of their enrollment, were included. In addition, a variable was constructed to reflect whether the mother delayed her enrollment into Medicaid by comparing the trimester her prenatal care began from the birth certificate data (whether or not paid for by Medicaid) with the trimester she was Medicaid enrolled. If her enrollment trimester lagged behind the trimester that she initiated care, she was categorized as 'delaying Medicaid enrollment'.

Bundled billing is when providers typically bill a specific CPT code after all antepartum care has been rendered using the last antepartum visit as the date of service. In Georgia, specific rates for a packaged group of pregnancy-related services which include prenatal care, labor and delivery, and postpartum care, are paid through a single "bundled" payment. As such, in the current study, 2 separate global billing variables, Global1 and Global2, were constructed from specific inpatient and outpatient CPT procedures. For Global1, women were flagged if they

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received prenatal and delivery care billed under the following obstetrical care CPT bundled codes: 59400, 59510, 59610 and 59618. Women with a Global2 flag had their care billed under one of the following obstetrical care CPT bundled codes: 59400, 59510, 59610 and 59618. Differences in the tendency of women in the PCCM and FFS to have had their care provider bill under Global1 or Global2 were tested.

Potential risk factors in this study included:1) demographic characteristics (i.e., age, marital status, education, residence, and race); 2) behavioral risk factors (i.e., smoking and alcohol use); 3) obstetric conditions (i.e., number of previous pregnancies, history of spontaneous abortion, previous pregnancy); 4) adverse pregnancy and/or birth outcomes (i.e., preterm birth or small for gestation or low weight birth, abruptio placentae, cervix incompetence, placenta previa, delivery type, and fetal distress); 5) medical conditions (i.e., preeclampsia, eclampsia, preexisting chronic hypertension, diabetes mellitus, vaginosis, and anemia); and 6) the trimester the woman entered into prenatal care. A single index indicating the presence of any of the complications from the above list of adverse pregnancy outcomes and medical conditions was also created. This summary measure is used in the demographic analysis.

Outcome variables included prenatal hospitalization, total Medicaid costs, length of stay longer than 2 days following delivery, total number of prenatal care visits, and delivery by cesarean section. In this study, prenatal hospitalization was defined as a hospital admission for a pregnancy-related complication without delivery, or a hospital admission more than two days before delivery. Total costs included the amounts paid by Medicaid for all inpatient and outpatient services used during pregnancy or at delivery. Since global billing was used extensively in Georgia, only the combined costs of prenatal and delivery services together were examined.

Differences in prenatal care and delivery costs across the two sectors were assessed using Pearson chi-square contingency statistics and multivariate log linear and logistic analysis. Multiple logistic regression procedures were used to derive the adjusted odds that a woman had a prenatal hospitalization, a length of stay longer than 2 days following delivery, or a cesarean section at delivery. Log-linear regression analysis on total costs for pregnancy and delivery services and total prenatal care visits was also estimated; direction and significance of the impact of PCCM using a dummy variable for enrollment in that sector was employed. Testing for the effect of being in PCCM using data on only those women for whom services were not globally billed was employed.

RESULTS

Marked differences in the characteristics of pregnant women served by these two sectors were revealed (Table 1). Women enrolled in PCCM during their pregnancy were the mirror image of those in FFS in terms of eligibility group. Whereas 86% of those in PCCM were eligible through welfare-related criteria, only 16% of those in FFS were; correspondingly, 84% of those in FFS are RFTSMs. There are virtually no disabled pregnant women served by the FFS sector, while 11% of the PCCM sample fall into that category.

Differences in eligibility criteria in PCCM versus FFS has implications for length of enrollment in the two sectors as the RFTSMs were eligible only when their pregnancy is confirmed, whereas the other two groups are eligible for Medicaid whether pregnant or not. Almost all of the women in PCCM, 97%, were enrolled from their first trimester, whereas only 74% of those served by FFS were enrolled this early. Women in the FFS sector were also less likely to be teens (8% vs. 22%), far more likely to be white (57% vs. 20%),

Table 1

Demographic Characteristics of Women PCCM and FFS Sectors

	Fee For Service (FFS) (N=29,306)	Georgia Better Health Care (PCCM) (N=3,523)	X^2 & p-value
Aid Category Recipients			
Pre-qualified	16%	86%	12193.93, p<.0001
Right From the Start Medicaid Mom (RFTSM)	84%	3%	
Disability	0%	11%	
Enrollment Term			
Since 1st Trimester	74%	97%	945.22, p<.0001
Since 2nd Trimester	19%	2%	
Since 3rd Trimester	7%	1%	
Bundled Claims (Global 1)			
Yes	72%	69%	7.25, p<.01
No	28%	31%	
Bundled Claims (Global 2)			
Yes	10%	14%	68.92, p<.0001
No	90%	86%	
Mother's Age			
18-34	87%	73%	745.50, p<.0001
> 35	5%	5%	
10-17	8%	22%	
Mother's Race			
White	57%	20%	1864.01, p<.0001
African American	43%	80%	
Mother's Marital Status			
Married	41%	17%	771.34, p<.0001
Single	59%	83%	
Any Pregnancy Complications			
Yes	26%	25%	4.39, p<.05
No	74%	75%	
Maternal Smoking During Pregnancy			
Yes	17%	10%	119.98, p<.01
No	83%	90%	
Delay			
No Delay	80%	94%	535.28, p<.0001
Delay 1 Trimester	13%	1%	
Delay 2 Trimesters	5%	1%	
Delay Other (3 Trimesters)	2%	4%	
Mean Total Prenatal Care Visits	11.78	10.83	t=187.90, p<.001

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married (41% vs. 17%) and somewhat more likely to be smokers (17% vs. 10%). FFS women were more likely to have Global1 bundled claims (72% vs. 69%) and less likely to have Global2 claims (10% vs. 14%) than those served by PCCM. Those served by FFS were slightly more likely to experience an adverse birth outcome or pregnancy complication (25% vs. 24%) compared with those served by PPCM.

PCCM women compared with FFS were also less likely to have a delay between the trimester they enrolled in Medicaid and the trimester prenatal care began (94% vs. 80%), and less likely to have a one trimester (1% vs. 13%) or a 2 trimester (1% vs. 5%) delay. PCCM women were twice as likely as FFS women (4% vs. 2%) to initiate prenatal care in the 3rd trimester having had enrolled into Medicaid that same trimester or earlier.

Despite the differences in various characteristics between the two groups and the shorter time enrolled in Medicaid for those served by FFS, FFS women had a slightly (not statistically significant) higher number of prenatal care visits, X = 11.78, versus X = 10.83 visits for those in PCCM. Although certain characteristics of those in the FFS sector, i.e., higher income, white, married, could be predictive of lower costs, they were more likely to smoke and had more prenatal care visits.

Data in Table 2 confirmed the expected (based on their characteristics) lower costs for women served by FFS. Mean Medicaid costs were $7,570 for women in PCCM, while average costs were only $5,742 for FFS women. Although marked differences in the characteristics of women in each group would guide differences in the overall means within virtually all strata, PCCM enrollees cost more than FFS with one exception, the disabled. Average costs for FFS disabled pregnancies and deliveries were almost $15,000 compared with approximately $9,000 for those disabled in the PCCM sector. However, since the number of disabled women in the FFS sample was noted to be too small for comparison (n = 38), this group was omitted from further analyses.

While PCCM was expected to achieve some cost-savings compared to FFS, it is clear that PCCM served a more needy (lower income) and less healthy population. PCCM served these women for a longer period during their pregnancy and indeed, perhaps prior to pregnancy. Higher average costs in this sector may reflect then, the longer duration of service provision costs related to higher case-mix (not fully measured here). Furthermore, it may be the case that PCCM, through its primary physician case management function, actually provided more of the care needed by pregnant women.

To further assess the differences in the costs by service sector, multivariate analyses were conducted not only to account for the differences in demographics but also to examine separate outcomes thought to drive observed differences in total costs. Specifically, in Table 3, adjusted outcome results are presented for 1) log of dollar costs, 2) logistic analysis of whether the woman stays longer than 2 days post delivery, 3) logistic analysis of whether the woman had a prenatal hospitalization; 4) logistic analysis of whether she experienced cesarean section delivery, and 5) log linear analysis of the total number of prenatal care visits received.

The results for total costs indicate that even after adjusting for the numerous differences in the characteristics in the two sectors, those in PCCM were more costly to the Medicaid program. Interpretation of a semi-logarithmic function requires taking the exponent of the coefficient and subtracting 1.00; hence, a woman served by PCCM can be expected to cost Medicaid close to 12% more than if served by the FFS sector. As such, despite the primary care management function of PCCM, after adjusting for the greater needs and enrollment duration of the women it

Table 2
Net Pay: Means (Standard Deviations), F-test/t-test

	Fee For Service (FFS) (N=29,306)	Georgia Better Health Care (PCCM) (N=3,523)	t-test /F-test p-value
ALL	$5,742 ($3,337)	$7,570 ($4,794)	t=294.59, p<.0001
Aid Category Recipients			
Pre-qualified	$6,398 ($3,280)	$7,391 ($4,414)	F=278.15, p<.0001
Right From the Start Medicaid Mom (RFTSM)	$5,604 ($3,045)	$7,421 ($3,344)	
Disability	$14,785 ($33,888)	$9,011 ($7178)	
Enrollment Term			
Since 1st Trimester	$5,835 ($3,114)	$7,578 ($4,774)	F=186.56, p<.0001
Since 2nd Trimester	$5,577 ($4,175)	$8,209 ($7,058)	
Since 3rd Trimester	$5,194 ($2,949)	$6,166 ($2,411)	
Bundled Claims (Global 1)			
Yes	$7,099 ($4,909)	$7,7776 ($4,729)	F=486.79, p<.0001
No	$4,969 ($4,051)	$6,049 ($2,952)	
Delay			
No Delay	$5,800 ($3,085)	$7,566 ($4,772)	F=129.01, p<.0001
Delay 1 Trimester	$5,611 ($4,712)	$8,147 ($7,224)	
Delay 2 Trimesters	$5,180 ($2,972)	$6,166 ($2,457)	
Delay Other (3 Trimesters)	$5,556 ($3,083)	$7,861 ($4,736)	
Mother's Race			
White	$5,677 ($3,429)	$8,142 ($4,723)	F=294.47, p<.0001
African American	$5,829 ($3,209)	$7,431 ($4,801)	
Mother's Marital Status			
Married	$5,746 ($3,165)	$8,264 ($5,589)	F=291.50, p<.0001
Single	$5,740 ($3,450)	$7,431 ($4,608)	
Trimester When Prenatal Care Began			
1st Trimester	$5,764 ($3,410)	$7,577 ($4,512)	F=170.78, p<.0001
2nd Trimester	$5,648 ($2,927)	$7,489 ($5,738)	
3rd Trimester	$5,556 ($3,083)	$7,861 ($4,736)	

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serves, this sector incurred more costs, rather than less.

Some additional insights are gained regarding PCCM from the remaining outcomes in Table 3. PCCM is associated with greater odds of having a prenatal hospitalization, but lower odds of a postpartum hospital stay longer than 2 days. Finally, being served by PCCM did not result in more prenatal care visits but rather, somewhat fewer.

To further examine outcome differences for PCCM and FFS, we conducted separate analyses for blacks and whites. An abbreviated table of the results is provided (Table 4). For both racial groups, total costs are higher under PCCM than under the FFS delivery system after controlling for other factors. Also, both white and black mothers were less likely to have a stay longer than 2 days if served by PCCM versus FFS. However, blacks serviced by PCCM were less likely to have more prenatal care visits compared with blacks served by FSS, whereas there was no effect of delivery system on the number of visits for whites. In contrast to whites, blacks were far more likely to have a prenatal hospitalization under PCCM than blacks in the FFS sector. The results for blacks tend to mirror our overall results.

DISCUSSION

Despite the expectation that PCCM should lead to lower costs, current results did not indicate lower combined prenatal and delivery cost savings. To the contrary, higher PCCM costs as well as more prenatal hospitalizations, longer postpartum stays, and more cesarean sections were revealed compared to FFS. While this study provides new information on the PCCM program within Georgia Medicaid, there are several key limitations. First, selection into the two sectors is heavily affected by Georgia's program structure making it very difficult to separate out the effects of demographics from the program itself. Overwhelmingly, PCCM serves those women who fall into the much lower income welfare-related and disabled eligibility groups compared to those in the FFS sector. While eligibility group and numerous other demographics have been controlled, there are likely unmeasured characteristics (e.g., general health status) correlated with eligibility group that affect the ability of each sector to serve its enrolled population.

It is also important to note that this study is not a pre-post design but rather, a cross-sectional comparison of two sectors. In earlier analysis of PCCM in Georgia, pre-post analysis with appropriate control counties (those not yet in PCCM) or individuals serving as their own controls over time were used (Bronstein, Adams and Florence, 2004; Bronstein et al., 2005). These studies employed stronger analytic designs. In the current investigation, resources did not allow for linking Medicaid enrollment, claims, and birth certificate data over a longer period. Perhaps, if these women were followed over a longer period of time, potential cost savings under PCCM would be realized in less future health related problems and their associated costs.

In addition, the use of global billing in Georgia, as in other states, meant that separating out the costs of individual prenatal care services was not possible. Rather, the combined costs of pregnancy and delivery were examined in the current study. The costs for those women whose services were billed globally were captured by the amount paid by Medicaid for the global bill plus other individually billed services thus diluting the costs specific to prenatal versus delivery effects.

Due to the structure of policies within the Georgia PCCM program, a lower-income, and generally a sicker population of pregnant women relative to FFS are served. Despite the expectation that PCCM should lead to lower costs, current results did not indicate lower combined prenatal and delivery cost savings. To the contrary, higher PCCM costs as well as

Table 3

Multinomial Log Linear Regressions & Multinomial Logistic Regressions

	TOTAL COSTS (Log Linear)	LENGTH OF STAY (Logistic)	PRENATAL HOSPITALIZATION (Logistic) Odds Ratio	DELIVERY BY CESAREAN (Logistic) Odds Ratio	TOTAL PNC VISITS (Log Linear)
Enrollment Term					
Since 1st Trimester	.19***	.96	3.06***	1.02	.11***
Since 2nd Trimester	.10***	1.05	3.46***	.99	.05***
Since 3rd Trimester (ref)	--	--	--	--	--
Prenatal Care Began					
Since 1st Trimester (ref)	--	--	--	--	--
Since 2nd Trimester	.02*	.81**	.75***	.88**	-.35***
Since 3rd Trimester	.06*	.83	1.01	.92	-.91***
Maternal Age					
18-34	.03**	.99	.99	1.50***	.05***
35+	.04*	1.51***	1.37**	2.32***	.07***
10-17 (ref)	--	--	--	--	--
Recipient's Aid Category					
Pre-qualified	.16***	1.21***	1.39***	1.06	-.01
RFTSM (ref)	--	--	--	--	--
Maternal Race					
White (ref)	--	--	--	--	--
African American	-.007	1.18***	.81***	1.09*	-.06***
Marital Status					
Married (ref)	--	--	--	--	--
Single	.04***	1.11*	.63***	.90**	-.03***
Previously Pregnant					
Yes	.11***	.69***	.91	.86***	-.03***
No (ref)	--	--	--	--	--
Smoking While Pregnant					
Yes	.04***	.86*	.65***	1.03	-.07***
No (ref)	--	--	--	--	--
Maternal Residence					
Urban (ref)	--	--	--	--	--
Rural	-.10***	.90*	1.20***	1.24***	-.04***
Health Care Group					
FFS (ref)	--	--	--	--	--
PCCM	.11***	.68***	1.33***	1.00	-.05***
Vaginosis					
Yes	.08*	.69	1.01	.86	.04*
No (ref)	--	--	--	--	--
Chronic Hypertension					
Yes	.19***	2.39***	.93	1.80**	.01
No (ref)	--	--	--	--	--
Preclampsia and Eclampsia					
Yes	.05	7.43***	1.21	1.84***	-.05*
No (ref)	--	--	--	--	--
Diabetes Mellitis					
Yes	.14***	1.97***	1.72***	2.28***	.06***

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Table 3

Multinomial Log Linear Regressions & Multinomial Logistic Regressions, Continued

No (ref)	--	--	--	--	--
Maternal Anemia					
Yes	.02	.99	1.12	1.11	.01
No	--	--	--	--	--
Fetal Distress					
Yes	.20***	1.65***	.91	10.91***	.01
No (ref)	--	--	--	--	--
Hx of Induced Abortion					
Yes	.10	3.18 (p=.09)	.01	3.07*	-.05
No	--	--	--	--	--
Hx of Spontaneous Abortion					
Yes	.05***	1.40***	1.12 (p=.09)	1.24***	.03***
No (ref)	--	--	--	--	--
Incompetent Cervix					
Yes	.39***	1.56	2.04 (p=.08)	2.13**	-.15***
No (ref)	--	--	--	--	--
Premature Membrane Rupture					
Yes	.10***	3.47***	1.36*	1.16 (p=.13)	-.14***
No (ref)	--	--	--	--	--
Placenta Previa					
Yes	.16*	3.46***	2.84**	15.68***	-.04
No (ref)	--	--	--	--	--
Precipitous Labor					
Yes	-.10**	.48**	.83	.05***	-.10***
No (ref)	--	--	--	--	--
Abruptio Placentae					
Yes	.29***	2.13***	1.41	5.63***	-.17***
No (ref)	--	--	--	--	--
Number of Observations	32,362	32,405	32,405	32,405	32,059
Tests, df, & p-values **Log Linear : R-square & F** **Logistic: Wald Chi-square**	R^2=.05 F=70.95, df= 26, p<.0001	X^2=708.43, df=26, p<.0001	X^2=347.98, df=26, p<.0001	X^2=1585.49, df=26, p<.0001	R^2=.27 F=463.38, df= 26, p<.0001

*Beta coefficients listed for log linear regression model with Total Costs & Total Prenatal Visits; Odds Ratios listed for logistic regressions models with length of stay, prenatal hospitalization and c-section. * = p<.05, ** = p < 0.01, *** = p < 0.001.*

more prenatal hospitalizations, longer postpartum stays, and more cesarean sections were revealed compared to FFS. It is impossible to say whether these effects are due to more contact with a primary care physician or to the receipt of better care. It is difficult to say whether the prenatal hospitalizations could have been prevented through better care management, or whether they represent extra care needed during pregnancy. Given the lower odds of a stay longer than 2 days at delivery, it may represent the latter. Perhaps, if these women were followed over a longer period of time, potential cost savings under PCCM would be realized in less future health related problems and their associated costs.

A major objective of PCCM is to better manage and coordinate care which, in turn, should reduce costs and perhaps, reduce racial disparities. The current data lend some support to the notion that racial disparities may still exist among Georgia women receiving pregnancy and delivery services by PCCM and FFS. The key racial difference is a significantly higher odds of prenatal hospitalization under PCCM versus FFS for blacks but not whites. It is difficult to say whether these are due to emergencies or better management of risky pregnancies. That PCCM also lowers

Table 4

Multinomial Log Linear & Multinomial Logistic Regressions: Whites & Blacks

	TOTAL COSTS (Log Linear)	LENGTH OF STAY (Logistic)	PRENATAL HOSPITALIZATION (Logistic)	DELIVERY BY C-SECTION (Logistic)	TOTAL PRENATAL VISITS (Log Linear)
WHITES					
FFS	--	--	--	--	--
PCCM	0.17***	0.51** (0.33-0.79)	1.09 (0.80-1.48)	1.21 (0.96-1.54)	0.01
BLACKS					
FFS	--	--	--	--	--
PCCM	0.12***	0.76** (0.62-0.93)	1.50** (1.21-1.86)	0.97 (0.84-1.12)	-0.04***

*Beta coefficients listed for log linear regression model with Total Costs & Total Prenatal Visits; Odds Ratios listed for logistic regressions models with length of stay, prenatal hospitalization and c-section. * = p<.05, ** = p < 0.01, *** = p < 0.001.*

the number of prenatal care visits for blacks and not whites is of concern.

While the results indicate higher costs in the PCCM sector, it is difficult to predict what costs would be to the Medicaid Program in the absence of PCCM, given the health status and health needs of pregnant women enrolled prior to pregnancy. One could speculate that the cost to Medicaid would be even higher if this low-income, needier population did not receive the better coordination of services available under PCCM. These issues will need to be addressed as Georgia continues to turn toward full capitation under its new managed care initiative requiring all pregnant women to enroll in capitated care within days of enrollment. A major policy issue will be whether managed care companies (MCOs) can get RFTSMs to enroll earlier and hence, manage their care better. Data indicate that over one quarter of women served by the FFS, predominantly RFTSMs, enrolled later than the first trimester. This will make it difficult for MCOs to screen for maternal and infant complications or provide counseling regarding risk behaviors; smoking rate, for example, among those in the FFS sector was far greater than among those in PCCM.

Yet, MCOs have the ability to help lower-income and disabled women prevent unintended pregnancies and to 'bridge' the intrapartum period between pregnancies. They can serve these groups both pre-pregnancy and for longer durations during pregnancy and postpartum. The question is whether they can find methods to serve them better than they were served under the PCCM system. If the historical experience of PCPs within PCCM means they will incur higher costs for this group, then will they tend to avoid enrolling them in their plans, or use other forms of 'risk selection'. Georgia will need to review its payment policies and capitated rates to induce plans to serve both longer-term enrolled pregnant women as well as the RFTSMs more efficiently and effectively.

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