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## Do Increases in Payments for Obstetrical Deliveries Affect Prenatal Care?

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### Synopsis .....

*Raising fees is one of the primary means that State Medicaid Programs employ to maintain provider participation. While a number of studies have sought to quantify the extent to which this policy retains or attracts providers, few have looked at the impact of these incentives on patients. In this study, the authors used Medicaid claims data to examine changes in volume and site of prenatal care among women who delivered babies after the Maryland Medicaid Program raised physician fees for deliveries 200 percent at the end of its 1986 fiscal year.*

*Although the State's intent was to stabilize the pool of nonhospital providers who were willing to deliver Medicaid babies, it was also hoped that women would benefit through greater access to prenatal care, especially care rendered in a nonhospital setting. The authors' hypotheses were that (a) the fee increase for obstetrical deliveries would result in an*

*increase in prenatal visits by women on Medicaid, and (b) the fee increase would lead to a shift in prenatal visits from hospital to community based providers.*

*The data for Maryland's Medicaid claims for the fiscal years 1985 through 1987 were used. Comparisons were made in the average number of prenatal visits and the ratio of hospital to nonhospital prenatal visits before and after the fee increase. Data for continuously enrolled women who delivered in the last 4 months of each fiscal year were analyzed for between and within year differences using Student's t-test and ANOVA techniques.*

*The findings indicate very little overall change in either the amount or location of prenatal care during the year after the large fee increase for deliveries. Though significant increases in the number of prenatal visits occurred for women who lived outside of Baltimore City, it is difficult to attribute these changes solely to the fee increase. Where an effect was observed, it appeared to be greatest in nonurban areas of the State, probably because coordination of care by fewer Medicaid providers is more common in such areas.*

*The findings do not support the hypotheses that raising fees for obstetrical deliveries uniformly increase community-based prenatal care. Instead, the findings suggest that tying fee increases for obstetrical deliveries to the amount of prenatal care provided for each patient may be the best way of increasing the commitment of Medicaid obstetrical providers to give their patients more comprehensive perinatal care.*

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**W**ITH MALPRACTICE COSTS rapidly increasing in Maryland during 1985 and 1986, the Maryland Medicaid Program was facing a potential crisis in access to obstetrical care. The decision by the State Medicaid Program to raise reimbursement fees to physicians and nurse midwives for standard deliveries at the end of 1986 was a unique attempt to try to cope with this emerging crisis. The State responded to the prospect of diminishing numbers of providers willing to deliver babies of Medicaid mothers by

eliminating the financial disparity which existed between Medicaid and most third-party insurers. The magnitude of this fee increase left no doubt as to the goal of the State Medicaid Program at the time: to improve access to obstetrical delivery service by drastically raising fees before a potentially more costly crisis occurred.

The reimbursement rates for routine deliveries went from \$265 to \$550 on March 1, 1986, and then to \$795 on July 1, 1986—the start of the State's fiscal

Table 1. Characteristics and prenatal care use of women who were continuously enrolled in Maryland's Medicaid Program and who gave birth in the last 4 months of fiscal years 1985-87

Demographics	FY 85 (N = 1,332)		FY 86 (N = 1,396)		FY 87 (N = 1,532)	
	Percent or mean	Standard deviation	Percent or mean	Standard deviation	Percent or mean	Standard deviation
Age (average years).....	23.84	4.89	25.00	5.10	23.92	4.92
Percent nonwhite.....	68.7	...	68.9	...	70.9	...
Percent Baltimore City.....	55.1	...	53.0	...	53.4	...
Percent normal delivery <sup>1</sup> .....	71.1	...	70.7	...	71.5	...
Percent Aid to Families with Dependent Children.....	85.0	...	86.8	...	86.7	...
Percent receiving substance abuse treatment.....	1.0	...	2.0	...	2.0	...
Prenatal care use:						
Average total prenatal visits.....	7.24	5.67	7.76	6.12	7.29	6.61
Average physician or clinic prenatal visits.....	3.47	4.12	4.11	4.67	3.89	4.16
Average hospital outpatient prenatal visits.....	2.75	4.31	2.02	3.14	1.92	2.84
Average local health department prenatal visits.....	1.02	2.25	1.64	3.46	1.47	3.31
Ratio of hospital outpatient departments to physician prenatal visits (for women with physician visits).....	1.16	2.81	0.80	2.15	0.84	1.97
Prenatal visits to renderer of delivery.....	.44	.44	.42	.44	.43	.44

<sup>1</sup>"Normal" delivery is billed under Diagnosis Related Group 373 as "normal vaginal delivery."

NOTE: The following mean prenatal visits show statistically significant differences between years using Student's *t*-test: total prenatal visits: 1985/1986, *P*<.05; 1986/1987, *P*<.05. Physician or clinic prenatal visits: 1985/1986, *P*<.01;

1985/1987, *P*<.01. Hospital outpatient prenatal visits: 1985/1986, *P*<.01; 1985/1987, *P*<.01. Local health department prenatal visits: 1985/1986, *P*<.01; 1985/1987, *P*<.01. Ratio of hospital outpatient departments to physician prenatal visits: 1985/1986, *P*<.01; 1985/1987, *P*<.01.

year. Fees for all other forms of deliveries, such as cesarean sections, were increased as well. A small increase in payments for prenatal care visits (from \$17 to \$21) was introduced at the same time. By increasing reimbursement fees for deliveries, the Maryland Medicaid Program did not deliberately intend to directly influence where pregnant Medicaid women received prenatal care. If there had been such an intention, much higher increases in rates for specific prenatal procedures would have been introduced.

The respective increases in payment rates effectively placed Medicaid reimbursements for prenatal and obstetrical delivery services at the same level as those of Blue Cross-Blue Shield in Maryland at the time. It was hoped that this overall increase would offset the effects of rising malpractice costs, which were blamed for the increasing reluctance of obstetricians to deliver women with Medicaid coverage. The State sought to maintain an adequate supply of private providers of delivery services so that emergency room deliveries would not be a frequent occurrence (1).

Earlier research that looked at the effects of this fee increase on the volume and duration of provider participation indicates that it may have had only a short-term effect. The number of participating obstetrical providers rose more than 20 percent in the two quarters after the fee increase, before reverting to the same rate of decline as that preceding it (2,3). In addition, physicians, on average, increased the number of Medicaid obstetrical deliveries about 5

percent more than predicted from statistical models (2,3). The research question addressed in this paper is whether the fee increase encouraged private physicians to increase not only their billing for deliveries but also their provision of prenatal care to low-income women.

The major focus of previous evaluations of the effect of payment increases has been on identifying changes in the number of participating providers or in their Medicaid caseloads (4-6). The effects of such policy initiatives on their patients are less well documented (7,8). In this study, we used Medicaid claims data to investigate the extent to which increases in payment for deliveries affected the use of prenatal care among Medicaid-eligible women.

## Background

Cohen and Rosenbach, using data collected during the early 1980s, showed that higher Medicaid fees did not result in either beneficiaries receiving greater volume of services (Cohen) or low-income children increasing their contact with physicians (Rosenbach) (9,10). Similarly, work by Fossett and coworkers suggested that an increase in Medicaid fees was unlikely to have a major effect on overall participation by physicians in supplying obstetrical-gynecologic Medicaid services (11). A fourth study, by Long and coworkers using 1978 National Health Interview Survey data came to the same conclusion; basically, Medicaid recipients were just as likely to see a physician over the course of a year, regardless of

what the physician was paid (12). They also found, however, that the site where services were received varied with fee levels. More people used physicians' offices relative to hospital outpatient departments (OPDs) when fees were higher. Indeed, each of these studies suggests that when physician fees are low, Medicaid recipients will still receive care, but access to care in physicians' offices is less likely to occur.

In addition to research which shows that women receive similar numbers of prenatal visits regardless of the level of physician payment, evidence exists that the method of payment (fee-for-service or capitation) also has little impact on volume of prenatal visits (13,14).

## Evaluation Study Design and Methods

We hypothesized that the fee increase for obstetrical deliveries would result in an increase in prenatal visits by women on Medicaid and that the fee increase would lead to a shift in prenatal visits from hospital to community-based providers. The source of data for the study was Maryland Medicaid claims for fiscal years 1985 through 1987. These data represent a relatively comprehensive source of utilization information on users of the Medicaid Program when the data are reorganized into analytic files. Much recent work has gone into the use and construction of State Medicaid claims files to evaluate policy initiatives (6,15-17).

For this study, providers who delivered babies and billed Maryland Medicaid were identified for delivery procedures affected by the fee increase. These providers could be identified because Maryland Medicaid, unlike many private insurers, did away with "global" fees (which included all prenatal and obstetrical delivery services) in 1983. Prenatal care visits were identified using both CPT-4 (Physicians Current Procedural Terminology, 4th Edition) codes and ICD-9 (International Classification of Diseases, 9th Edition) diagnosis codes, which indicated outpatient pregnancy-related encounters.

We created person-specific records for women who delivered in each of the fiscal years. To capture all possible billed prenatal claims for each recipient in a given year, only women who were continuously enrolled in Medicaid for any 1 year and who delivered in the final 4 months of the fiscal year were included. OPD, physician, and local health department claims were then merged into a single record for each woman so that the proportion of hospital OPD to private physician prenatal claims could be compared between years.

The dependent variables in the study were the

*'It was hoped that this overall increase would offset the effects of rising malpractice costs, which were blamed for the increasing reluctance of obstetricians to deliver women with Medicaid coverage.'*

number of prenatal visits and the proportion of outpatient to private prenatal visits. Comparisons of these variables were made for women who delivered in each year using ANOVA and *t*-tests, where appropriate.

Comparisons were also made by measurable characteristics of the women that were identified using Medicaid claims. They included race (white or nonwhite); aid category (AFDC [Aid to Families with Dependent Children] or non-AFDC); maternal age (18 years or younger, 19-25, 26-36, and older than 36); and residence (Baltimore City or remainder of Maryland). We also investigated the effects of the change in reimbursement rates on the type and place of services received. They were type of delivery (routine vaginal or other); women who may have been at higher risk due to substance abuse treatment (billed treatment within the last year for alcohol or drug problems or no billed treatment); hospital of delivery (if at one of the five hospitals with the highest volume of Medicaid patients); and unbilled delivery (physician bill submitted to Medicaid for delivery or no bill submitted for delivery). It was assumed that a delivery with no accompanying bill corresponding to a hospital claim was a delivery by a hospital resident. Residents are not legally allowed to bill Medicaid for services which are rendered in a hospital, although the hospital can. A final characteristic studied was whether the renderer of delivery increased participation in response to the fee increase.

This dichotomous variable was designed for women having a billed physician delivery, whether the physician's average number of Medicaid obstetrical deliveries increased significantly after the fee increase, or whether the physician's number of deliveries were not significantly affected by the fee increase. For example, physicians who increased their obstetrical deliveries after the fee increase by 25 percent more than the average for their geographic area within the State would have been categorized this way (2,3).

## Results

Table 1 describes the characteristics of the population of continuously enrolled women delivering

Table 2. Prenatal visits by women who were continuously enrolled in Maryland's Medicaid Program and delivering in the last 4 months of fiscal years 1985-87, by personal characteristics both within and between years

Personal characteristics	Preintervention visits				Postintervention <sup>1</sup> within year 1987		Statistical <sup>2</sup> significance between years (ratio)	
	Within year 1985		Within year 1986		Mean	P value	P<.05	P<.01
	Mean	P value	Mean	P value				
Total prenatal visits .....	7.24	...	7.77	...	7.29	...	...	...
Race:								
White .....	8.03	...	9.46	...	8.85	...	...	1985:1986
Nonwhite .....	6.87	.01	7.01	.01	6.64	.01	...	1985:1987
Aid category:								
Aid to Families with Dependent Children (AFDC) .....	7.12	...	7.75	...	7.18	...	...	...
Non-AFDC .....	7.91	NS	7.89	NS	8.00	NS	...	...
Age (years):								
18 or younger .....	6.40	...	7.41	...	7.71	...	...	...
19-25 .....	7.10	...	7.73	...	7.29	...	...	...
26-36 .....	7.75	...	7.84	...	7.11	...	...	...
Older than 36 .....	9.26	.05	8.54	NS	7.91	NS	...	...
Type of delivery: <sup>3</sup>								
Normal .....	7.09	...	7.58	...	7.29	...	...	...
Not normal .....	7.61	NS	8.23	NS	7.30	NS	...	...
Residence:								
Baltimore City .....	6.82	...	5.48	...	4.71	...	...	1985:1986
Not Baltimore .....	7.75	.01	10.34	.01	10.25	.01	...	1985:1987
Substance abuse treatment:								
Treatment .....	5.80	...	6.36	...	7.12	...	...	...
No treatment .....	7.25	NS	7.79	NS	7.29	NS	...	...
Hospital of delivery (5 highest volume):								
Johns Hopkins Hospital .....	9.69	...	4.61	...	3.39	...	...	1985:1986
University of Maryland Hospital .....	6.45	...	6.15	...	5.15	...	...	1985:1987
Sinai Hospital .....	5.51	...	5.99	...	5.92	...	...	...
Prince George's General Hospital .....	6.08	...	9.92	...	7.22	...	...	...
Mercy Hospital .....	5.45	.01	5.24	.01	4.56	.01	...	...
Unbilled-billed deliveries: <sup>4</sup>								
Billed .....	7.67	...	7.82	...	7.24	...	1985:1986	1985:1987
Not billed .....	6.15	.01	7.67	NS	7.45	NS	...	...
Renderer of delivery affected by fee increase: <sup>5</sup>								
Large increase .....	5.96	...	7.40	...	6.90	...	...	...
All others .....	7.45	.01	7.82	NS	7.52	NS	...	...

<sup>1</sup>Fees for deliveries increased from \$265 to \$550 in last quarter of FY 1986 and to \$790 beginning with FY 1987.

<sup>2</sup>Analysis of variance used for both between and within year differences.

<sup>3</sup>"Normal" delivery is billed as Diagnosis Related Group 373.

<sup>4</sup>"Unbilled" delivery lists hospital but no rendering provider.

<sup>5</sup>Providers identified as greatly increasing their participation after the fee increase.

NOTE: NS = not significant.

in the last 4 months of each year. A general profile emerges of women about 24-25 years old who most likely reside in Baltimore City, are nonwhite, are in the aid category of AFDC, and who had a routine vaginal delivery. In general, these women had between seven and eight prenatal visits. In the aggregate, about half of these visits were to private physicians or clinics, 30 percent to hospital outpatient clinics, and 20 percent to local health departments. The ratio of hospital outpatient prenatal visits to private physician visits for women dropped over time, but remained close to 1, while the proportion of prenatal visits to physicians who performed the deliveries (among women who had providers billing for deliveries) remained slightly more than 40 percent.

The characteristics of women on Medicaid showed very little change between 1985 and 1987. There was some movement away from hospital prenatal care and to both private physician and local health departments, although the primary movement appears to have taken place between 1985 and subsequent years.

Table 2 shows the number of visits for the 3 study years by characteristics of women, the type of delivery services received, and site of service. Two-way analysis of variance indicated no significant changes in prenatal visits or delivery services between 1986 and 1987. All significant changes that did occur took place between 1985 and either 1986 or 1987. With respect to individual characteristics, for each study year, white women had a significantly greater number of prenatal visits than nonwhite

women ( $P < .01$ ). In addition, women from outside Baltimore City had far more prenatal visits than women living in the city ( $P < .01$ ).

Table 3 presents the ratio of prenatal visits to a hospital outpatient department to those in private prenatal clinics for the 3 study years by characteristics of women on Medicaid and the services they received. Similar to findings for prenatal visits, the ratio of hospital outpatient prenatal visits to physician visits showed virtually no significant change between the years corresponding to the increase in physician fees for deliveries, 1986 and 1987. The one exception is the large increase in hospital to private prenatal visits seen for white women relative to nonwhites between 1986 and 1987. This increase suggests a greater movement to hospital-based prenatal care for white women associated with the fee increase to private providers.

For each of the study years, Baltimore City residents had a greater ratio of hospital outpatient to private or clinic prenatal visits than nonresidents, while the ratio was lower for women whose provider submitted a bill for the delivery. A number of characteristics of women appeared to be associated with differences in this ratio in different study years. While nonwhite women showed significantly more hospital visits than whites in 1985, this relationship reversed in 1987. Older women also appeared to use hospital facilities for prenatal care more frequently than younger women in 1985 and 1986.

The findings in tables 2 and 3 suggest that changes in the number of visits and the ratio of hospital outpatient visits to nonhospital visits differed for Baltimore City and the rest of the State. Accordingly, table 4 describes differences in the number of prenatal visits when Baltimore City is looked at separately from the remainder of the State. Because the Baltimore City Medicaid population contains a larger proportion of nonwhites than elsewhere in the State, we further broke out averages by race.

This analysis revealed a striking increase in the average number of prenatal visits beginning in 1986 among white and nonwhite women on Medicaid living outside Baltimore City and a parallel drop in this average among women living within the city. The difference between Baltimore City and the rest of the State was statistically significant ( $P < .01$ ).

Variation within and between race and Baltimore is shown in table 5. For the interaction between race and Baltimore, non-Baltimore residence was also significant ( $P < .01$ ). This significance suggests that there are factors associated with both the interrelationship of race and place of residence which also affect the receipt of prenatal care over time. These

*'The evidence that the more children a woman has had the more likely she is to delay care or to seek none at all may account, partially, for the relatively low number of prenatal visits we observed throughout the study.'*

factors may include unmeasured ones such as access to care, education, and segregated housing patterns which may have their greatest impact in urban areas of the State.

## Summary and Discussion

A desired benefit of the fee increase for deliveries was that providers would not only continue to deliver the same or greater number of babies of mothers on Medicaid, but that Medicaid obstetrical participation would increase as well, not just in terms of greater patient load but also numbers of providers participating, and greater use of prenatal care among women. In earlier reports coming from this study, we noted that the increase in fees did appear to improve the availability of private physicians and nurse midwives within Maryland, and patient loads showed a slightly greater than expected increase as well (2,3). Women did appear to retain access to private obstetrical delivery services over the period covering the fee increase, at least in the short term.

However, with regards to prenatal care, few apparent changes took place. While there appeared to be an increase in prenatal visits between 1985 and 1986, the 2 years preceding the fee increase, this trend did not continue into 1987. In fact, between 1986 and 1987 there was a decline in the average number of prenatal visits for women on Medicaid in Maryland. This decline was evident for virtually all categories of women, including those who were delivered by providers who appeared to have increased their participation significantly (measured by deliveries) after the fee increase was introduced.

In Baltimore City, home to more than half the women followed in this study, the average number of prenatal visits went from 6.82 in 1985 to 5.48 in 1986 to 4.71 in 1987. Even though we found a large increase in prenatal care in areas of the State outside Baltimore City, we cannot be certain that this increase was a direct result of the fee increase and not a result of other factors influencing prenatal care at the time. The statewide average of prenatal visits

Table 3. Ratio of hospital outpatient department to physician prenatal visits by women who were continuously enrolled in Maryland's Medicaid Program and delivering in the last 4 months of fiscal years 1985 and 1987 by personal characteristics

Personal characteristics	Preintervention				Postintervention <sup>1</sup> within year 1987		Statistical significance <sup>2</sup> between years	
	Within year 1985		Within year 1986		Mean ratio	P value	P<.05	P<.01
	Mean ratio	P value	Mean ratio	P value				
Total prenatal visits .....	1.16	...	0.80	...	0.84	...	...	...
Race:								
White .....	0.84	...	0.67	...	1.03	...	1985:1987	1986:1987
Nonwhite .....	1.34	.05	0.87	NS	0.75	.05	...	...
Aid category:								
Aid to Families with Dependent Children (AFDC) .....	1.09	...	0.77	...	0.82	...	...	...
Non-AFDC .....	1.54	NS	1.02	NS	0.97	NS	...	...
Age (years):								
Younger than 18 .....	0.63	...	0.60	...	0.61	...	...	...
19-25 .....	1.18	...	0.68	...	0.81	...	...	...
26-36 .....	1.34	...	0.89	...	1.01	...	...	...
Older than 36 .....	2.39	.05	2.21	.01	0.80	NS	...	...
Type of delivery: <sup>3</sup>								
Normal .....	0.96	...	0.69	...	0.80	...	...	1985:1987
Not normal .....	1.64	.01	1.04	.05	0.95	NS	...	...
Residence:								
Baltimore City .....	2.28	...	1.38	...	1.35	...	...	1985:1986
Not Baltimore .....	0.27	.01	0.36	.01	0.52	.01	...	1985:1987
Substance abuse treatment:								
Treatment .....	0.28	...	0.91	...	1.74	...	...	...
No treatment .....	1.17	NS	0.80	NS	0.83	NS	...	...
Hospital of delivery (5 highest volume):								
Johns Hopkins Hospital .....	4.82	...	0.83	...	0.93	...	...	1985:1987
University of Maryland Hospital .....	1.42	...	0.76	...	0.89	...	...	1985:1986
Sinai Hospital .....	0.88	...	0.97	...	0.99	...	...	...
Prince George's General Hospital .....	0.33	...	0.28	...	0.65	...	...	...
Mercy Hospital .....	1.92	.01	2.00	.01	1.18	.01	...	...
Unbilled-billed deliveries: <sup>4</sup>								
Billed .....	1.27	...	0.87	...	0.93	...	...	...
Not billed .....	0.78	.01	0.64	.01	0.58	.01	...	...
Renderer of delivery affected by fee increase: <sup>5</sup>								
Large increase .....	0.65	...	0.70	...	0.85	...	1985:1987	...
All others .....	1.25	.05	0.82	NS	0.84	NS	...	...

<sup>1</sup>Fees for deliveries increased from \$265 to \$550 in last quarter of FY 1986 and to \$790 beginning with FY 1987.

<sup>2</sup>Analysis of variance used for both between and within year differences.

<sup>3</sup>"Normal" delivery is billed as Diagnosis Related Group 373.

<sup>4</sup>"Unbilled" delivery lists hospital but no rendering provider bill.

<sup>5</sup>Providers identified as greatly increasing their participation after the fee increase.

NOTE: NS = not significant.

Table 4. Average number of prenatal visits by women who were continuously enrolled in Maryland's Medicaid Program and delivering in the last 4 months of fiscal years 1985-87

Characteristics	1985			1986			1987		
	Mean	SD <sup>1</sup>	Number of women	Mean	SD <sup>1</sup>	Number of women	Mean	SD <sup>1</sup>	Number of women
Total prenatal visits .....	7.24	5.67	1,332	7.77	6.12	1,396	7.29	6.61	1,532
Baltimore City .....	6.82	5.35	734	5.48	4.77	740	4.71	3.94	818
Whites .....	7.51	5.89	142	6.64	5.67	135	5.39	3.81	135
Nonwhites .....	6.65	5.16	592	5.23	4.26	605	4.58	4.07	683
Maryland excluding Baltimore .....	7.75	5.16	598	10.34	8.04	656	10.25	7.50	714
Whites .....	8.30	6.43	275	10.73	8.55	299	10.36	7.99	311
Nonwhites .....	7.29	5.65	323	10.01	7.75	357	10.16	7.39	403

<sup>1</sup>SD = standard deviation.

per woman actually declined after the fee increase for deliveries.

Our second hypothesis, that the fee increase would lead to a movement in prenatal care from hospital to community-based providers, also was not supported by our results. The ratio of hospital outpatient to private prenatal care showed a substantial drop between 1985 and 1987, though virtually all of this drop occurred between 1985 and 1986—before most of the fee increase took place. Since the bulk of this change occurred before the main intervention, this trend may not have had anything to do with the fee increase for deliveries. Among nonwhite women, women older than 36 years, and women delivered by hospital residents, this trend appeared to continue into 1987.

Although the overall drop suggests a movement away from hospital-based prenatal care after 1985, it appears that this phenomenon occurred largely independent of the change in physician reimbursement for deliveries that was fully implemented at the beginning of 1987. A possible explanation for this finding may be the graduated nature of the fee increase. As noted previously, the fee was increased in two stages, first going from \$265 to \$550 during the last 4 months of 1986, and then increasing to \$795 at the beginning of 1987. Women who delivered in the last 4 months of 1986 could have been served by providers who increased their participation immediately after the initial, “interim” fee increase and after intentions to raise fees further were announced. The rise in private prenatal visits relative to visits in hospitals’ outpatient departments may have reflected greater overall participation by providers during the final 4 months after fees for deliveries were raised.

Using Medicaid claims data, we were limited in our ability to measure care as accurately as we would have liked. Linking claims records with birth certificates would have given us information on the timing and continuity of care for most of these Medicaid-enrolled women, but these data were not available to us during the project period. Claims data for discrete fiscal years for continuously enrolled women provided us with reasonably complete data. However, we had to assume that women delivering in the last 4 months of the State fiscal year (March to June) were similar to women whose pregnancies overlapped fiscal years but who were excluded from the study. Though limiting our study population to continuously enrolled women allowed us to capture fully all Medicaid claims for pregnant women, it also effectively limited our study to women who were previously enrolled in Medicaid through AFDC, suggesting they had had an earlier delivery. The

Table 5. Two-factor analysis of variance performed for each race and Baltimore City and not Baltimore City

Source of variation	SS	df	MS	F	P-value
Sample .....	36.23	1	36.23	87.61	0.00
Column .....	1.10	2	0.55	1.33	0.33
Interaction .....	11.78	2	5.89	14.24	0.01
Within .....	2.48	6	0.41	...	...
Total .....	51.59	11	...	...	...

NOTE: SS = sum of squares; df = degrees of freedom; MS = mean square; F = statistic used to calculate significance.

SOURCE: Maryland Medicaid Information System. Division of Health Systems Analysis, Policy and Health Statistics Administration.

*‘By making higher fees for deliveries contingent on prenatal care administered to the same women, Medicaid agencies may improve the likelihood of obtaining better coordinated care for urban women who have limited access to nonhospital providers.’*

evidence that the more children a woman has had the more likely she is to delay care or to seek none at all (18) may account, partially, for the relatively low number of prenatal visits we observed throughout the study (tables 1–4).

Limitations notwithstanding, despite the fee increase Medicaid-enrolled women in Baltimore City received substantially less prenatal care than is recommended by the American College of Obstetrics and Gynecology and cited by the Institute of Medicine (19) and substantially less than other low-income women in the State. We found little evidence of a “carry-over effect” of more nonhospital and prenatal visits after physician fees were raised for deliveries.

Women living in largely rural parts of the State did show a significant increase in the average number of prenatal visits both during and after the fee increase. If the fee increase played a role in this change, we assume it is because the type and number of prenatal care providers are typically limited in rural areas. The fee increase may have served to further enhance care in these areas. That a decrease in the average number of prenatal visits was found in Baltimore City may well indicate the need for payment incentives which more adequately tie prenatal and obstetrical delivery services together, as typically found in rural settings.

This finding is similar to findings from an earlier study and is consistent with those of many policy makers (8,19,20). By making higher fees for deliveries contingent on prenatal care administered to the same women, Medicaid agencies may improve the likelihood of obtaining better coordinated care for urban women who have limited access to nonhospital providers.

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