

Comparison of Cesarean Section Rates in Fee-for-Service Versus Managed Care Patients in the Ohio Medicaid Population, 1992-1997

Siran M. Koroukian, PhD; Donna Bush, MSW; and Alfred A. Rimm, PhD

Objective: To examine changes over time in the cesarean section rates for fee-for-service (FFS) beneficiaries versus enrollees of managed care programs (MCPs) in the Ohio Medicaid population.

Study Design: Cross-sectional study using linked Ohio birth certificates and Medicaid files.

Patients and Methods: Study patients were Medicaid-enrolled residents of urban counties who had singleton, live births from 1992 through 1997 ($n = 86,459$). Changes in primary and repeat cesarean section rates were analyzed in the FFS and MCP groups. The test of homogeneity of odds ratios was used to measure the statistical difference between unadjusted odds ratios. Logistic regression analysis was conducted to adjust for risk factors.

Results: From 1992 to 1997, the difference in the rates of primary and repeat cesarean sections between FFS and MCP patients decreased. The unadjusted odds ratio (OR) increased from 0.66 to 0.81 ($P = .06$) for primary cesarean sections and from 0.67 to 1.04 ($P = .03$) for repeat cesarean sections; this indicated that the likelihood of undergoing a cesarean section increased over time for MCP enrollees compared with FFS beneficiaries. The results of the multivariate analysis indicated that the interaction term of payment source by year was not significant for primary cesarean sections (adjusted OR = 0.93; 95% confidence interval = 0.83, 1.04), but was highly significant for repeat cesarean sections (adjusted OR = 0.53; 95% confidence interval = 0.44, 0.64).

Conclusion: We observed a reduction in the difference between the rates of both primary and repeat cesarean sections in FFS and MCP patients over time. The reduction was not statistically significant for primary cesarean sections. For repeat cesarean sections, however, we observed a convergence of the rates for FFS and MCP patients.

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Medicaid managed care programs (MCPs) have been available to patients eligible for Ohio Works First (OWF, formerly known as Aid for Families with Dependent Children) residing in major metropolitan counties for more than a decade. Enrollment in MCPs has been increasing over the last several years. From 1992 to 1997, the proportion of MCP births to total OWF births in urban counties increased from 18% to over 70%. In 1992, enrollment in MCPs was mandatory in 1 county (Dayton area) based on a waiver approved by the Health Care Financing Review under section 1915b of the Social Security Act and voluntary in most other metropolitan counties. In July 1996, enrollment in MCPs became mandatory for all OWF-eligible patients residing in Ohio's 6 major metropolitan counties. The term "mandatory enrollment" implies that most eligible patients with no special health

From the Department of Epidemiology and Biostatistics, School of Medicine, Case Western Reserve University, Cleveland, OH (SMK, AAR); and the Bureau of Health Plan Policy, Ohio Department of Job and Family Services, Columbus, OH (DB).

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Address correspondence to: Siran M. Koroukian, PhD, 4171 Goldenseal Way, Hilliard, OH 43026-3007. E-mail: siran@columbus.rr.com.

needs are required to receive care through MCPs rather than through the traditional fee-for-service (FFS) system. However, when more than 1 MCP is available in a service area, OWF-eligible patients are expected to select a program of their preference. If individuals have not made a choice within a certain time frame, then a plan is selected on their behalf.

The financing of healthcare through fixed capitated arrangements has been considered a means of cost containment. The fixed payments to MCPs are designed to give managed care organizations an incentive to reduce the utilization of unnecessary services, which in turn results in savings to payers. Critics have argued that in trying to reduce utilization in order to achieve savings, MCPs often compromise quality of care. A number of studies have been done to examine patterns of utilization and outcomes among MCP enrollees compared with patients receiving care through traditional FFS arrangements. Some studies have suggested that outcomes are less favorable for MCP enrollees than for those receiving their care through FFS.^{1,2} Others, on the other hand, have reported either no difference in outcomes between the 2 systems of care³⁻⁸ or better processes or outcomes of care for MCP enrollees than for FFS beneficiaries.⁹⁻¹¹

With regard to contractual arrangements between Medicaid and MCPs, Medicaid pays a monthly capitation fee to MCPs for each OWF enrollee in return for provision of the health services needed by the individual. However, MCPs can have a variety of contractual agreements with providers in the community, including payment to providers on a FFS basis. The plans are at full financial risk for services defined by the Ohio Department of Human Services, which administers the Medicaid program.

Enrollees in the OWF program are predominantly mothers and children, and the program provides coverage to more than one third of all infants born annually in Ohio. This explains why maternal and child health is an area of primary focus for the Medicaid administration. In fact, many studies examining differences in utilization and outcomes between Medicaid FFS and MCPs have focused on differences in adequacy of prenatal care utilization, birth outcomes, and methods of delivery. However, most of those studies examined these differences at a given point in time, and it is not known how the gradual expansion of Medicaid MCPs has affected these outcomes over time. Temporal studies of this nature have been done in the Medicare population, and a number of studies have identified "spillover" effects of the Medicare health maintenance organi-

zation (HMO) market expansion (ie, increased HMO activity) in the form of decreased hospital costs or lower traditional Medicare costs.^{12,13}

Cesarean section (C-section) rates have been one of the many quality indicators proposed by the Health Employer Data and Information Set (HEDIS).¹⁴ After the dramatic increase in C-section rates during the 1970s and 1980s, serious efforts have been undertaken within the medical community in the last several years to reduce C-section rates.^{15,16} In the presence of high rates of unnecessary C-sections, it can be hypothesized that the financing and delivery of healthcare services may have an impact on reducing C-section rates, resulting in lower rates in MCPs than in FFS systems.

This study compares primary and repeat C-section rates in FFS and MCP patients in the OWF population. It further examines temporal changes in these rates to determine whether the differences between the 2 groups persisted over time after adjusting for various risk factors.

... METHODS ...

Source of Data

This is a cross-sectional study using linked birth certificate (BC) and Medicaid data. The records were linked through a 3-step process. Step 1 consisted of linking Medicaid-eligible infants' Medicaid records to the BC. Step 2 consisted of linking Medicaid-eligible mothers' Medicaid records to the BC. Finally, step 3 consisted of identifying the mother-infant pair linked to the same BC. The variables used in the linking process were patient identifiers, including first and last names, date of birth, date of delivery, hospital of delivery, residence address, county of residence, and zip code. In step 1 these variables referred to the infant's identifiers, whereas in step 2 they referred to the mother's. The linking algorithm in steps 1 and 2 consisted of a series of criteria in which identifiers were combined to create a unique identifier in each file. The criteria were "relaxed" gradually by dropping 1 identifier at a time from the unique identifier that included all identifying variables, or by including the first initial(s) of the names instead of the full names. This strategy was designed to address misspelling of names in the 2 datasets. The variables that were dropped at various stages of the linking process included, among others, the county of residence, the hospital where born, or the date of birth. Again, this approach was to remedy mismatches in 1 or the

other element(s) between the 2 datasets. It is important to note, however, that each of the combinations of variables, as developed at each stage of the linking, was believed to have been adequate to properly identify individuals across the datasets. Some of these variables, such as hospital of delivery and date of delivery, were retrieved from the claim records. No encounter data were available from MCPs during the study period. Thus, MCP beneficiaries were linked through unique identifiers that did not include any of the variables originating from claims records.

The match rates were calculated as follows: For FFS infants, the denominator consisted of those with a claim carrying a diagnosis-related group (DRG) birth code, whereas for MCP infants the denominator represented the number of infants who were enrolled in a Medicaid MCP in their first month of life. It is important to note that the MCP denominator for infants also included those with retroactive eligibility for Medicaid. However, those in the latter category could not be identified as such through Medicaid eligibility files. For mothers, the denominator could be determined only for FFS beneficiaries, or those with claims carrying a delivery DRG code. In the absence of MCP encounter data, no denominator could be determined for MCP mothers. For step 3, the denominators were the same as in step 1.

For step 1, the match rates ranged from 85% in 1995 to 102% in 1996 for FFS beneficiaries, and from 75% in 1993 to 92% in 1996 for MCP enrollees. For step 2, the match rate was obtained only for FFS beneficiaries; it ranged from 84% in 1995 to 97% in 1996. For step 3, the rates ranged from 70% in 1997 to 86% in 1996 for FFS mother-infant pairs, and from 48% in 1994 to 79% in 1992 for MCP enrollees. The drop in the match rates from steps 1 and 2 to step 3 was to be expected. A successful match in step 3 requires (1) that both the mother's record and the infant's record had successfully been matched to the same BC record and (2) that both mother and infant were eligible for Medicaid at the time of delivery or birth. There may be cases, for example, where a teenage mother had been receiving health coverage through her parents' insurance policy that would not provide coverage for the infant, and the infant would enroll in the Medicaid program. Thus, the infant—but not the mother—would be found eligible for Medicaid. A similar situation may arise in the case of retroactive eligibility for infants, or in the case of adoption. In this study, only cases matched through step 3 were included in the analysis. This strategy was adopted despite the lower match rates in step 3

with the specific objectives to (1) exclude any false-positive matches and (2) include only mother-infant pairs where both the mother and the infant were eligible for Medicaid at the time of delivery or birth.

In order to ensure that this strategy did not yield any biases, the analysis on the change of cesarean rates in the FFS and MCP populations over time was repeated separately on each of the 3 groups of mothers and infants identified through step 1, step 2, and step 3. In all 3 scenarios, the results yielded the same conclusion. It is also noteworthy that, for the last several years, the linked BC-Medicaid database has been used to produce the annual report on Maternal and Infant Health released by the Ohio Department of Job and Family Services. This database also served as the source of data in a recently published article on the safety of early discharge for Medicaid newborns.¹⁷ These facts attest to the validity of the data used in this study.

The study included singleton, live-born infants during state fiscal years 1992 through 1997 (July 1991 through June 1997). The study was limited to singleton births for the following reasons: (1) C-section rates are much higher for multiple births than for single births, and the proportions of multiple births may differ between the FFS and MCP groups; and (2) the match process between BC and Medicaid records is much more complicated for multiple births than for single births. Mothers who were eligible for the Medicaid disability program or for the expanded Medicaid program known as Healthy Start (which offers Medicaid benefits to pregnant women and children with incomes exceeding the OWF income eligibility levels) were excluded from the study. This is because MCPs did not become available to patients eligible for the disability program or to those enrolled in the Healthy Start program until toward the end of the study period. The study population was limited to infants born between 24 and 46 weeks of gestation, weighing between 500 and 5000 grams at birth, and to residents of the 6 major metropolitan counties where Medicaid MCPs either had been active before the study period or had become available during the study period. The 6 major metropolitan counties included in the study were Cuyahoga, Franklin, Hamilton, Montgomery, Lucas, and Summit.

Study Variables

With the exception of a variable that identified the mother-infant pair as FFS beneficiaries or MCP enrollees in the Medicaid program, all variables used in this study were retrieved from the BC. The demographic variables used in this study were maternal race

(dichotomized as white or nonwhite); age (<35 years or ≥35 years); education (lower educational attainment [<12 years] or higher educational attainment [≥12 years]); and marital status (married or single).

The BC includes a number of conditions that are grouped under the categories of maternal medical risk factors, complications of labor and delivery, obstetrical procedures, methods of delivery, and congenital anomalies. Each of these categories includes a list of specific conditions with a check box for each of the items listed. A listing of “other” is also included in each of these categories; it is designed to reflect the presence of a condition not listed specifically under that category.

The infant’s birth weight as well as gestational weeks at birth are also available on the birth certificate. Birth weight was dichotomized as ≤4000 grams or >4000 grams; the variable “gestational weeks” was dichotomized (<37 weeks or otherwise) to define prematurity.

The methods of delivery are recorded on the BC as vaginal, primary C-section, repeat C-section, vaginal birth after C-section (also referred to as VBAC), forceps, and vacuum extractor.

The hospital of delivery also is listed on the BC. The teaching status of the hospital was retrieved from the 1993 *American Hospital Association Guide to the Health Care Field*.¹⁸ Teaching status in this study indicates that the hospital has been approved to participate in residency training programs by the Accreditation Council for Graduate Medical Education. It is important to note that this criterion for teaching status refers to the approval of any residency program, not necessarily that of obstetrics and gynecology. Based on this definition, 37 of the 120 hospitals in these counties were identified as teaching hospitals. Further analysis indicated that 90% of the births occurred in teaching hospitals that also offered residency programs in obstetrics and gynecology (n = 21).

Records with unknown or missing values, as well as those with obvious errors—including inconsistencies between birth weight and gestational weeks¹⁹ or between the methods of delivery—were excluded from the analysis. For example, records were excluded when they noted a birth weight of <500 grams or >2000 grams for infants born between 29 and 30 weeks of gestation. Similarly, records were excluded when they identified methods of delivery that were incompatible with one another. Cases of such incompatibility included (1) vaginal delivery along with any cesarean delivery; (2) use of operative procedures (ie, forceps or vacuum extractor) in cesarean deliv-

eries; and (3) a delivery described as both a primary and repeat C-section. A number of deliveries were identified as operative vaginal deliveries, without specifying whether a forceps or a vacuum extractor was used in the course of a vaginal or a VBAC delivery. Given that only a small percentage of all vaginal deliveries are VBAC, those deliveries were classified as vaginal deliveries. A total of 3391 records for the study period were excluded from the analysis. However, the annual rates of primary and repeat C-sections for each of the study groups remained unchanged.

Analysis

Univariate and bivariate analyses were performed in each study group to analyze the relationship of maternal risk factors to primary and repeat C-sections. The outcome of primary C-section was analyzed in the group of mothers undergoing C-section for the first time. Thus, the rate of primary C-section was calculated as follows:

$$\text{Rate of Primary C-Section} = (\text{Deliveries Through Primary C-Section} \times 100 / \text{Deliveries Through Primary C-Section} + \text{Deliveries Through Vaginal Birth [Excluding VBACs]})$$

The outcome of repeat C-section was analyzed in the group of mothers with history of at least 1 previous C-section. This group included mothers undergoing a VBAC or a repeat C-section in their current pregnancy. The rate of repeat C-section was calculated as follows:

$$\text{Rate of Repeat C-Section} = (\text{Deliveries Through Repeat C-Section} \times 100 / \text{Deliveries Through Repeat C-Section} + \text{Deliveries Through VBAC})$$

Thus, the rate of VBAC would be 100 minus the rate of repeat C-sections.

Unadjusted odds ratios were obtained to compare primary and repeat C-section rates in FFS and MCP mothers. The test of homogeneity of odds ratios was performed to measure statistical significance between unadjusted odds ratios obtained for the first and last years of the study period.

Multivariate logistic regression analysis was conducted to study the association between the outcomes of interest and enrollment in managed care programs between 1992 and 1997 after adjusting for maternal demographics, medical risk factors, complications of labor and delivery, and characteristics of the newborn. The logistic models developed for each of the outcomes of primary and repeat C-sections included maternal sociodemographic variables, maternal risk factors, complications of labor

and delivery, characteristics of the newborn, hospital teaching status, and the interaction term of payment source by year. The indicator for payment source was coded 1 for MCP enrollees and 0 otherwise, and the study year was coded 1 for 1997 and 0 for 1992. The interaction term was designed to capture changes in the study groups over time with respect to differences in their primary and repeat C-section rates. Variables included in the multivariate models were chosen based on the results of univariate and bivariate analyses. Since not all independent variables could be included in the models, only conditions with high prevalence were considered. The test of homogeneity of odds ratios was performed

using StatXact 4, software developed by Cytel Corporation (Cambridge, MA); Statistical Analysis Systems (SAS), version 6.0, (Cary, NC) was used for all other analyses.

... RESULTS ...

A total of 86,459 singleton live births were included in the study. **Table 1** shows the distribution of births in the FFS and MCP groups by type of delivery and by study year. The distribution of mothers by sociodemographic characteristics indicated that the MCP group generally included a greater proportion

Table 1. Distribution of Births by Type of Delivery, Maternal Sociodemographic Characteristics, Maternal Medical Risk Factors, and Complications of Labor and Delivery, 1992–1997

Characteristic	Fee-for-Service						Managed Care Programs					
	1992	1993	1994	1995	1996	1997	1992	1993	1994	1995	1996	1997
Type of delivery												
Vaginal	11,532	11,207	9506	7757	5468	2699	2641	3265	1898	3177	4924	6202
Primary C-section	1397	1259	1127	1035	679	319	212	229	173	289	496	596
VBAC	331	444	466	350	195	130	124	183	139	208	285	343
Repeat C-section	916	834	658	531	345	153	230	252	167	239	431	418
Total deliveries	14,176	13,744	11,757	9673	6687	3301	3207	3929	2377	3913	6136	7559
Maternal demographics*												
Nonwhite	55.9	56.1	56.8	53.5	53.8	57.5	65.4	66.7	64.4	64.4	64.8	64.6
Education <12 years	44.1	42.6	41.5	40.8	42.2	26.9	49.5	48.0	43.4	44.8	43.5	43.4
Age >35 years	3.0	3.0	3.6	3.9	4.8	4.4	3.0	2.9	4.1	3.5	3.1	4.0
Single	80.5	81.5	82.4	83.6	84.0	84.5	83.1	84.3	83.6	86.0	87.6	86.6
Type of hospital												
Teaching	88.9	89.9	89.0	87.9	86.7	89.9	91.5	93.7	90.7	91.4	91.7	88.5
Maternal medical risk factors and complications of labor and delivery*												
Diabetes	1.7	1.7	2.2	2.1	1.8	1.8	2.8	2.4	2.9	3.2	2.2	2.2
Pregnancy-associated hypertension	1.9	2.0	2.3	2.5	2.3	2.7	1.2	1.8	2.2	2.6	2.0	1.9
Other medical risk factors	16.1	17.7	22.4	29.4	26.1	28.9	23.9	26.2	31.3	34.6	31.3	27.4
Meconium	10.3	10.2	10.2	11.5	9.5	9.4	15.0	13.8	14.2	13.4	11.6	10.9
Premature rupture of membranes	3.2	3.4	3.6	3.5	3.4	2.6	4.5	4.2	4.1	3.9	3.1	2.9
Breech/fetal malpresentation	2.3	2.2	2.4	2.7	2.9	2.0	2.2	2.0	2.0	2.1	2.3	1.9
Cephalopelvic disproportion	1.3	1.1	1.2	1.2	0.7	0.8	1.4	1.1	1.3	1.5	0.6	0.5
Fetal distress	4.9	7.6	5.8	6.5	7.1	5.1	5.0	6.1	3.9	5.0	6.6	4.6
Other complications of labor and delivery	14.0	13.9	15.6	16.1	13.4	14.1	14.7	15.6	18.5	16.0	15.1	12.9

C-section = cesarean section; VBAC = vaginal birth after C-section.

*Percent of total deliveries.

of nonwhites, those who were single, and those with lower educational attainment than the FFS group. In addition, except for 1997, more MCP than FFS mothers delivered in teaching hospitals. No notable differences were observed in the distribution of mothers by most medical risk factors and complications of labor and delivery. However, for most years, MCP mothers were more likely than their FFS counterparts to present with “other” medical risk factors.

Figure 1 shows the primary C-section rates for MCP and FFS mothers over time. For each of the study years, the rate of primary C-section was higher among FFS mothers than MCP mothers. However, the difference between the groups appeared to be decreasing over the study period. For repeat C-sections, the difference in the rates that was observed in 1992 was no longer present in 1997 (Figure 2).

The unadjusted odds ratios for primary and repeat C-sections in FFS and MCP mothers are compared in Table 2. In addition, the table includes exact *P* values obtained through the test of homogeneity of odds ratios. For primary C-sections, the unadjusted odds ratio increased from 0.66 to 0.81, implying that the likelihood of undergoing primary C-section for mothers enrolled in MCPs compared with those in the FFS system increased somewhat over time (*P* = .06). For repeat C-sections, the unadjusted odds ratio increased from 0.67 to 1.04, indicating that the differences in the likelihood of undergoing repeat C-section for MCP enrollees versus FFS beneficiaries converged over time (*P* = .03).

Table 3 shows the results of the multivariate logistic regression analysis. As discussed above, the analysis was conducted separately for each of the outcomes of primary and repeat C-sections. Except for “other” maternal medical risk factors, the presence of meconium, and premature rupture of the membranes, the results indicated that maternal medical risk factors and complications of labor and delivery were strongly associated with primary C-section. Among the demographic variables, maternal age of more than 35 years and single marital status increased the likelihood of primary C-section. Similarly, women delivering prior to 37 weeks of gestation or women delivering babies with a

birth weight exceeding 4000 grams were more likely than others to undergo a primary C-section. The hospital teaching status was not associated with the outcome.

The interaction term of payment source by year was not statistically significant, indicating that after adjusting for various risk factors, the likelihood of an MCP enrollee undergoing a primary C-section compared with the likelihood for an FFS beneficiary did not change significantly between 1992 and 1997 (adjusted odds ratio [AOR] = 0.93; 95% confidence interval [CI] = 0.83, 1.04).

Figure 1. Primary Cesarean Section Rates

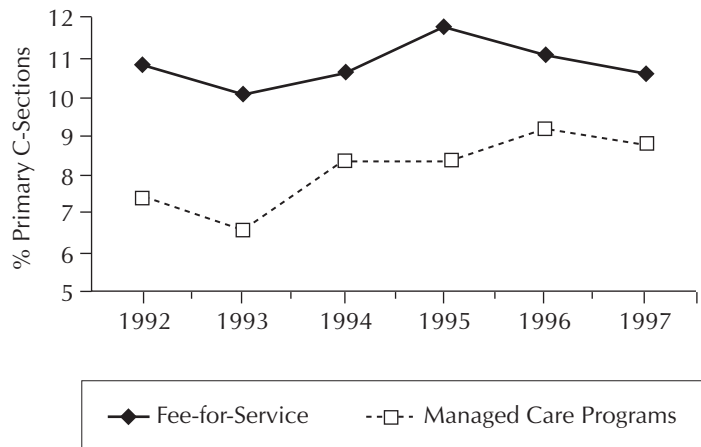


Figure 2. Repeat Cesarean Section Rates

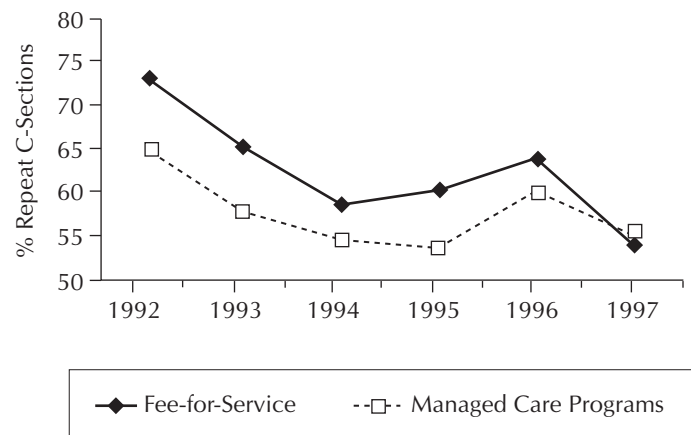


Table 2. Comparison of Unadjusted Odds Ratios of Primary and Repeat C-Sections for MCP versus FFS Populations, 1992 and 1997

Type of C-Section	1992	1997	Test of Homogeneity of Odds Ratios (P)
Primary			
FFS	1.00	1.00	
MCP	0.66	0.81	.06
Repeat			
FFS	1.00	1.00	
MCP	0.67	1.04	.03

C-section = cesarean section; FFS = fee-for-service; MCP = managed care program.

Table 3. Multivariate Analysis: Adjusted Odds Ratios for Primary and Repeat C-Sections, 1992 and 1997

Characteristic of Interest	Outcome Variable: Primary C- Section (n = 25,598)		Outcome Variable: Repeat C-Section (n = 2645)	
	AOR	95% CI	AOR	95% CI
Sociodemographic factors				
Nonwhite	0.94	0.85, 1.04	0.92	0.76, 1.11
Education <12 years	0.87	0.79, 0.96	0.90	0.76, 1.07
Age >35 years	1.31	1.03, 1.67	1.16	0.78, 1.73
Single	1.36	1.18, 1.57	0.91	0.73, 1.13
Maternal medical risk factors				
Diabetes	1.90	1.42, 2.53	1.76	1.07, 2.90
Pregnancy-associated hypertension	2.21	1.69, 2.88	0.89	0.52, 1.52
Other maternal risk factors	0.98	0.87, 1.10	0.89	0.73, 1.07
Complications of labor and delivery				
Meconium	1.03	0.89, 1.20	0.54	0.42, 0.71
Premature rupture of membranes	1.21	0.95, 1.55	0.39	0.24, 0.62
Breech/fetal malpresentation	70.53	55.48, 89.65	7.12	3.40, 14.92
Cephalopelvic disproportion	156.98	97.17, 253.59	23.18	3.15, 170.77
Fetal distress	11.28	9.86, 12.90	2.38	1.61, 3.51
Other complications of labor and delivery	2.67	2.37, 3.00	1.12	0.88, 1.41
Newborn				
Congenital anomalies	1.25	0.88, 1.77	0.99	0.47, 2.09
Birth prior to 37 weeks of gestation	1.32	1.17, 1.50	1.06	0.85, 1.33
Birth weight >4000 grams	2.10	1.77, 2.50	1.40	0.97, 2.01
Hospital				
Teaching status	0.87	0.75, 1.01	0.48	0.36, 0.62
Payment source				
Payment source x time interaction	0.93	0.83, 1.04	0.53	0.44, 0.64
C statistic*	0.79		0.66	

AOR = adjusted odds ratio; CI = 95% confidence interval; C-section = cesarean section.

*The area under the receiver operating curve (ROC).

The results of the model designed to analyze the outcome of repeat C-section (Table 3) were somewhat different from the results for primary C-section. Maternal demographic variables, gestational age, and birth weight were not associated with repeat C-sections.

In contrast to the results for primary C-section, some of the complications of labor and delivery (ie, meconium-tainted amniotic fluid, premature rupture of the membranes) decreased the likelihood of repeat C-section. These results indicate perhaps that women experiencing active labor have a greater likelihood of delivering vaginally. This hypothesis is consistent with the fact that most women with a history of previous C-section who undergo a trial of labor in their current pregnancy have successful vaginal deliveries.²⁰

It is of interest to note that mothers delivering in teaching hospitals were half as likely as those delivering in nonteaching hospitals to undergo repeat C-section (AOR = 0.48; 95% CI = 0.36, 0.62). Also, the characteristics of the newborn were not associated with repeat C-section, whereas they were associated with primary C-section. The interaction term of payment source by year proved to be highly statistically significant (AOR = 0.53; 95% CI = 0.44, 0.64), indicating that after adjusting for various risk factors, the difference observed in 1992 between MCP and FFS in the likelihood of undergoing a repeat C-section was no longer present in 1997.

In summary, we observed that the likelihood of undergoing a C-section for an MCP enrollee compared with an FFS beneficiary increased over time for both primary and repeat C-sections. The increase in the likelihood of undergoing a primary C-section was not statistically significant. However, the rates of repeat C-section converged between the 2 groups.

... DISCUSSION ...

The primary C-section rate remained almost constant during the study period for the FFS population and increased among MCP enrollees. However, this change did not yield any significant decrease in the difference between FFS and MCP mothers with respect to their likelihood of undergoing primary C-section. On the other hand, the rates of repeat C-section in the MCP and FFS populations converged over time, and the difference between the 2 populations in the likelihood of undergoing repeat C-section observed in 1992 was not present in 1997. These changes occurred despite the fact that no utilization management strategies were implemented in the FFS population during the study period. One explanation is that the expansion of Medicaid MCP markets has resulted in a pooling of physician and hospital resources at the community level; thus, most physicians who care for Ohio Medicaid MCP enrollees also retain their FFS clientele. This would imply that the same providers care for both MCP and FFS beneficiaries and exercise the same practice style in caring for all their patients regardless of the payment method.

Another reason for the closing gap in repeat C-section rates between the MCP and FFS populations may be that more than two thirds of OWF-eligible patients residing in urban counties were receiving care through Medicaid MCPs by the end of the study period. This would make it increasingly difficult for managed care organizations to enroll the lower-risk segment of the population and to benefit from a more favorable selection. As a result, the MCP and FFS groups may have become more similar in their risk profile over time.

The fact that utilization patterns between managed care and FFS beneficiaries become similar over time has been reported before, particularly as it relates to the experience of Medicare beneficiaries. The systemwide spillover effect of increased managed care activity in a given market area has been translated into a decline in total hospital costs and lower traditional Medicare expenditures. The

decreasing difference between the adjusted C-section rates in Medicaid MCP and FFS patients could well be a phenomenon similar to the spillover effect described above. However, it is of interest to note that, in this study, the spillover effect appeared to have impacted the outcomes of primary and repeat C-sections differently. For primary C-sections, we observed an increase over time in the likelihood of undergoing a primary C-section among MCP enrollees compared with FFS beneficiaries, but this increase was not statistically significant. For repeat C-sections, on the other hand, we found that the rates converged for the MCP and FFS groups. One possible explanation may be that primary C-sections are hardly ever performed on an elective basis, whereas as many as one third of repeat C-sections were performed in 1996 in Ohio in the absence of any documented medical conditions that could present an indication for a C-section.²¹ With such a large proportion of repeat C-sections performed on an elective basis, there may have been more opportunity to reduce the rates of repeat C-sections in the FFS population.

The limitations of this study are related to the lack of completeness or accuracy of BC data. These limitations are documented elsewhere.^{22,23} In addition, the BC data fail to document the process of care, including elements that are critical in medical decision making (eg, varying degrees of fetal distress, meconium-tainted amniotic fluid). However, we do not believe that these deficiencies have affected our results.

... CONCLUSION ...

This study showed that there has been a moderate increase in primary C-section rates in MCP patients and no change in their FFS counterparts. However, rates of repeat C-section for Medicaid FFS and MCP patients converged over time. Further studies should determine whether similar changes have occurred between the 2 groups in other utilization measures and outcomes.

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