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# Evaluation of California's Statewide Implementation of Enhanced Perinatal Services as Medicaid Benefits

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## Synopsis .....

*The authors evaluated enhanced perinatal services developed by public health specialists that were*

*implemented statewide through specially certified Medicaid providers to find out whether they were as effective as those services originally tested in the public health agency's pilot project, and more effective than services from regular Medicaid providers. Multivariate logistic regression analyses yielded adjusted odds ratios of use of care and health outcome measures for the statewide services compared with both the pilot project and routine Medicaid care.*

*Although women receiving the enhanced services implemented statewide did not return for prenatal visits as well as those in the pilot project, they did better than women with routine Medicaid providers. Women who kept at least the eight prenatal visits recommended by the Public Health Service in 1989 had risks of low weight births no different from those in the pilot project and significantly better than those for women with at least eight visits with routine Medicaid providers (adjusted odds ratio 0.70 with a 95 percent confidence interval from 0.54 to 0.91). Thus, there is evidence for the efficacy of the services, but additional improvement could be realized through improving the use of care.*

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**I**MPLEMENTATION OF HEALTH SERVICES is a largely uncharted area in establishing health policy and not merely administrative routine (1). Statewide implementation of enhanced perinatal services for low-income women was done so rapidly in Michigan in 1984 and 1985 that a number of programmatic setbacks occurred (2). Implementing services developed by public health agencies through State Medicaid Programs can be particularly difficult. State Medicaid Programs have not had impressive records in getting women to use prenatal care or improving birth weight outcomes (3-5). After completion of the Obstetrical Access Demonstration Project by the Maternal and Child Health Branch (6,7), the California Department of Health Services took 5 years (1984 to 1989) to implement the enhanced perinatal services in its statewide Comprehensive Perinatal Service Program (CPSP) (8). The services were implemented through its Medicaid Program (Medi-Cal) in collaboration with the Maternal and Child Health Branch.

Evaluation of the public health agency pilot project demonstrated that recipients of enhanced services did not start prenatal care earlier, but they did return for more prenatal visits and had significantly better birth weight outcomes than women in routine Medicaid care (6,7). Because of the changes that were made in service delivery during the implementation process, we undertook the following study to determine whether the CPSP implemented statewide was as effective as its pilot project in improved use of prenatal care and in birth weight outcomes. Furthermore, because the effectiveness of the pilot project had been shown by comparisons with the routine Medicaid care prevailing at the time that the pilot project was conducted, this study also compares CPSP with routine Medicaid care when the program was implemented. The results of the study provide insight as to the importance of continuing to monitor effectiveness of public health services that are translated into Medicaid benefits.

Table 1. Percentage distribution of provider settings for the Comprehensive Perinatal Service Program (CPSP) and the Obstetrical Access Demonstration Project (OB Access)

Provider settings	CPSP		OB Access	
	Number	Percent	Number	Percent
Community clinics .....	8	29	7	64
Health departments .....	6	21	2	18
Private physicians' offices..	6	21	1	9
Public hospital clinics .....	5	18	0	0
Private hospital clinics .....	3	11	1	9
Totals .....	28	100	11	100

NOTE: The distribution of provider settings for Medi-Cal is not known. See "Methods, comparisons of provider and patient samples" for the reasons.

## Methods

**Prenatal services.** Three types of prenatal services are compared in this study. The enhanced perinatal services provided through the OB Access pilot project, enhanced perinatal services provided through the statewide CPSP, and routine perinatal services provided by obstetric providers generally participating in Medicaid (see box). Enhanced or comprehensive perinatal services in OB Access and CPSP are those derived from the maternal and infant care projects of the Maternal and Child Health Bureau of the U.S. Public Health Service (6). They were designed to provide an array of support services through an approach to care that integrated nutrition, social work, and health education with regular clinical perinatal services. Thus while routine perinatal services provided by obstetric providers generally participating in Medicaid includes obstetrical risk assessments and standard obstetrical care and may or may not include nutrition services as prescribed, in the enhanced service programs every woman was scheduled for risk assessments for nutrition, health education, and psychosocial ills. An individual care plan was required, outlining the coordinated support services that the woman was to receive in each area of risk. Subsequent support services included individual counseling and group classes, as well as referral and followup to specialized support services not available at the site. In the California enhanced care services, the risk assessments could be administered every trimester of care in all three areas, and prenatal vitamin and mineral supplements were to be prescribed for every woman.

Although the major components of the enhanced services tested in the pilot project and the statewide program were similar, a number of differences were documented in the administration of the services and the types of participating provider settings (see box

and table 1) (8). Compared with the pilot project (5), (a) MCH State staff operated the programmatic functions and Medicaid operated claims processing instead of MCH doing both; (b) oversight of service delivery was shifted from State specialists to locally appointed county coordinators with varying backgrounds, roles, and training; (c) proportionately more private physicians and public hospital clinics and fewer community and public health department clinics participated; (d) the use of nurse midwives delivering support services decreased; and (e) the use of health workers who had experience, but little or no special training in support service risk assessments or counseling, increased.

The ways of reimbursing service providers also differed among the pilot project, the statewide program, and routine Medicaid providers and could affect the use or outcomes of care. Although in the pilot project all services were fee-for-service, in CPSP routine perinatal services were covered by the global fee paid generally to obstetric providers participating in Medicaid, and support services were fee-for-service. In addition, CPSP providers were given financial incentives for desirable provider behavior that had been obtained in the pilot project through the annual site visits for contract approval.

Extra payments of \$50 were made for each patient whose care began in the first trimester to reward providers for not delaying the scheduling of the first prenatal care visit. A care coordination fee of \$111 was paid if all of the four first risk assessments (clinical, psychosocial, nutrition, and health education) were completed within the first month of care. And a payment of \$100 was made if a patient received 10 or more prenatal care visits. All of these incentives were designed to increase the chances that providers would encourage women to seek prenatal care early and often and receive appropriate care for a wide range of risks that could improve birth outcomes. As in the pilot project, a provider stood to earn more for providing enhanced services than just providing routine Medicaid care.

**CPSP provider sample.** All certified providers of CPSP who responded to a survey in 1990 (174 of 231 providers) indicating they had billed CPSP for services already provided by April 1989 and provided care to at least 50 Medicaid-eligible women a year (89 sites), were included in a sampling procedure (8). The study was limited to the two metropolitan regions in the State and two corresponding non-metropolitan regions comprising more than half of the State of California to control data collection costs. The 57 qualifying sites in the four regions were

## Comparison of Prenatal Services under Medi-Cal, the Comprehensive Perinatal Service Program (CPSP), and the Obstetrical Access Demonstration Project (OB Access)

<i>Type of services and facets of administration</i>	<i>Medi-Cal</i>	<i>CPSP</i>	<i>OB Access</i>
<b>Services</b>			
Obstetric risk assessments	<b>Routine</b>	<b>Routine</b>	<b>Routine</b>
Obstetric care	<b>Routine</b>	<b>Routine</b>	<b>Routine</b>
Nutrition risk assessments	Optional	<b>Required</b>	<b>Required</b>
Nutrition counseling	Optional	<b>Optional</b>	<b>Optional</b>
Psychosocial risk assessments	Rare	<b>Required</b>	<b>Required</b>
Psychosocial counseling	Rare	<b>Optional</b>	<b>Optional</b>
Health education risk assessments	Rare	<b>Required</b>	<b>Required</b>
Health education counseling	Rare	<b>Optional</b>	<b>Optional</b>
Coordinated care plan	Rare	<b>Required</b>	<b>Required</b>
Group classes	Optional	<b>Required</b>	<b>Required</b>
Vitamin and mineral supplements	Optional	<b>Required</b>	<b>Required</b>
<b>Administration</b>			
Program content	NA	MCH	MCH
Claims processing	Medi-Cal	Medi-Cal	MCH
Service delivery oversight	Medi-Cal audit	County generalists	State MCH specialists
Obstetric providers	MD, CNM	MD > CNM	CNM > MD
Support service providers	NA	More generalists	More specialists

NOTE: The words in boldface are the status of services paid for on a fee-for-service basis; these are audited by an oversight agency indicated in "service delivery oversight" under Administration.

NA = not applicable; MD = physician (family practitioner, obstetrician, pediatrician); CNM = Certified Nurse Midwife.

stratified by region and type of provider setting (private physician, private hospital clinic, community clinic, public hospital clinic, and public health department clinic, table 1). A random sample of two of each type of setting was selected. Because not all regions had two of each provider setting type certified and providing services at the time, in all 29 sites met the criteria (table 1). No sites refused to participate, but recovery of medical charts proved impossible at one site.

**CPSP patient sample.** The CPSP sample is composed of all Medicaid-eligible women (incomes less than 200 percent of the Federal poverty level and allowable assets not in excess of about \$3,000) who received one or more support service assessments (8). At each study site, the birth log was used to identify all Medicaid eligible women with births between June 30, 1989, and December 31, 1990. The medical charts of all women thus identified were requested

and, when a woman was found to have had at least one clinical visit, one CPSP support service risk assessment, and a singleton birth within the prescribed time, her medical chart, risk assessments, and individual care plan were all abstracted. Every chart meeting the three criteria was abstracted sequentially until 140 charts were abstracted. The final sample size for study was 3,662 women.

**Comparison of provider and patient samples.** All 11 participating providers (5 in metropolitan, 6 in nonmetropolitan areas) in the OB Access pilot project were included (table 1). Their practice settings were private physician's practice 1; private hospital clinic 1; community clinics 7; and public health department clinics 2 (7). The patient sample of 5,370 in the pilot project included women with family incomes no greater than 200 percent of the Federal poverty level, who completed OB Access care and had single live births (7).

No information on the prenatal providers for the Medicaid comparison group was available because birth certificate data were used to identify women for the Medicaid comparison group. Live births for whom Medicaid was the primary payor source for prenatal care were identified from a data item on the confidential portion of California birth certificates that was reported for 99.6 percent of births in 1989 and 1990. Medicaid prenatal care providers were identified from this item. No further information was available on them.

A random sample of women with Medicaid as the indicated prenatal payor source (but not CPSP) was selected from the California 1989 and 1990 live birth tapes in the same proportions from each year as births in the CPSP sample. The total Medicaid births were stratified by year, and a sampling ratio that provided a population three times the CPSP sample for each year was determined (N=10,836 singleton live births).

Although CPSP can also be indicated as the primary payor for prenatal care on the State birth certificate, it is greatly underreported. To eliminate as many CPSP patients as possible from the Medicaid sample, those Medicaid CPSP patients included in our CPSP sample were deleted from the Medicaid comparison sample. An unknown number of CPSP patients not in our CPSP sample and thus not identified may remain in the Medicaid random sample. The effect of their inclusion would be to lower the apparent strength of any beneficial effects of the CPSP in comparisons to usual "Medicaid" care.

**CPSP chart abstraction.** Data were abstracted by six accredited medical record technicians who were hired specifically for the study and carefully trained together (8). Their abstracted data were regularly collected and examined for completeness, errors, and inconsistencies so that corrections could be made before the technician left the study site.

**Analysis of prenatal care utilization.** Three aspects of the use of prenatal care were analyzed: late onset of care, poor continuity of care, and making less than a minimal number of visits. The onset of care was categorized as late if the first prenatal care visit occurred after the fourth month of gestation. The continuity of care was coded as poor if the proportion of visits actually kept was less than 80 percent of the number expected for the gestational period from the onset of care to birth, given the American College of Obstetricians and Gynecologists (ACOG) schedule of visits for an uncomplicated, low-risk term pregnancy

(9,10). The minimal number of comprehensive care visits used for the third measure of prenatal care use was the eight visits recommended by the Public Health Service Expert Panel for an uncomplicated pregnancy of a woman who has not had a preconception visit (11). The likelihood of women in CPSP to underutilize prenatal care by any of the three measures was compared with that for women in the OB Access pilot project and women in regular Medicaid care in separate multivariate logistic regression models. The indicator of the comparative use of prenatal care was the adjusted odds ratio for each measure. All models were adjusted for other possible explanatory variables of prenatal care use common to all three data sets (maternal age, race-ethnicity, previous live births, and marital status). Before modeling, the interactions of all explanatory variables in the model were tested, and those of age and parity were sufficiently large to require the use of interaction variables for adjustment; women 20 to 34 years of age with no previous births were used as the reference group.

**Analysis of low birth weight.** The birth weight outcome analyzed was low weight (less than 2,500 grams) for singleton live births. The likelihood of low birth weight in CPSP was compared with that in the OB Access pilot project and with regular Medicaid care in separate multivariate logistic regression models. The low birth weight odds ratios were adjusted in the manner described previously for prenatal care utilization, except that the sex of baby was added as an explanatory variable. The first adjusted low birth weight odds ratios obtained were for all women (regardless of the number of visits). Then the adjusted low birth weight odds ratios for women who obtained at least the minimal recommended number of visits were tested by further adjusting each model for onset and continuity of those visits. Finally, the dependence of the adjusted low birth weight odds ratios on support services with and without adjustment for onset and continuity of care was analyzed.

## Results

**Characteristics of the women.** The characteristics of the samples are presented so that the comparability of the populations can be examined before statistical adjustments are made. The total study samples for each of the three groups were generally similar in sociodemographic characteristics that have been shown to affect the use of care or birth weight outcomes (table 2). There tended to be proportion-

ately more whites (non-Latinas) in the CPSP sample (32 percent), than in Medicaid (27 percent) or OB Access (26 percent), but in general both groups had predominantly white, Latina women (46 percent, 51 percent and 50 percent respectively). In all three samples, African American women formed the next largest ethnic group (11 percent, 13 percent, and 10 percent respectively).

CPSP with 40 percent and Medicaid with 45 percent had much lower proportions of married women than OB Access with 62 percent. No statistical tests of significance for these differences are reported, both because the regression analyses adjust for differences and to avoid the problems of multiple testing.

**Use of prenatal care.** Direct comparison of CPSP with the OB Access pilot project indicated that women in CPSP were just as likely to start prenatal care early as in the pilot project, but they were less likely to return for prenatal visits once care began. Compared with routine Medicaid care, women with CPSP services were less likely to start care early, but more likely to return for prenatal visits once care began. Thus the services implemented statewide were no different than the pilot project in its associated effects on the start of prenatal care, but worse than routine Medicaid care; the statewide program was worse than the pilot project in its effects on the return for subsequent prenatal care visits, but better than routine Medicaid care.

**Onset of care.** There was no difference between CPSP and OB Access women in the relative odds that women started prenatal care in the first 4 months of gestation [adjusted odds ratio (OR) 0.99, confidence interval (CI) 0.90, 1.09] (table 3). Compared with Medicaid, however, participation in CPSP was associated with a later start in prenatal care (adjusted OR 1.31; CI 1.20, 1.42).

**Continuity of care.** Participation in CPSP was associated with decreased continuity of prenatal care visits when compared with OB Access, but increased continuity when compared with Medicaid. When the continuity of prenatal care is measured by the percent of ACOG-recommended prenatal visits for an uncomplicated pregnancy that women keep, continuity of care was significantly better in CPSP than in Medicaid in general (adjusted OR 0.49; CI 0.45, 0.54), but significantly worse than in the OB Access pilot project (adjusted OR 1.74; CI 1.54, 1.95) (table 3). About three-quarters (78 percent) of the CPSP women return for more than four-fifths of recommended visits, compared with 63 percent of women in regular Medicaid care.

Table 2. Comparison of the demographic characteristics of the Comprehensive Perinatal Service Program (CPSP), Medi-Cal, and the Obstetrical Access Demonstration Program (OB Access) study samples<sup>1</sup> (percentages)

Characteristic	Medi-Cal (N = 10,836)	CPSP (N = 3,648)	OB Access (N = 5,336)
<b>Race:</b>			
White, non-Latina . . . . .	27	32	26
White, Latina . . . . .	51	46	50
African American . . . . .	13	11	10
Other . . . . .	9	10	10
Missing . . . . .	0	2	3
<b>Age (years):</b>			
Younger than age 20 . . . . .	21	26	23
20-34 . . . . .	73	69	72
34 and older . . . . .	6	5	5
Missing . . . . .	0	0	0
<b>Parity:</b>			
Nulliparous . . . . .	38	43	43
Parous . . . . .	62	56	57
Missing . . . . .	0	1	1
<b>Marital status:</b>			
Married . . . . .	45	40	62
Unmarried . . . . .	55	59	35
Missing . . . . .	0	1	3
<b>Mother's education:</b>			
Less than 12 years . . . . .	54 (54)	57 (60)	45 (58)
12 years . . . . .	33 (34)	28 (30)	20 (25)
More than 12 years . . . . .	12 (12)	10 (10)	13 (16)
Missing . . . . .	2 . . .	6 . . .	22 . . .

<sup>1</sup>Excluding participants who had fetal deaths.

NOTE: Percentages in parentheses are calculated after excluding missing values because of the large proportion of women with missing values in the OB Access Demonstration Project.

**Threshold levels of care.** Women with CPSP providers were less likely than women in the OB Access pilot project to have returned for at least the minimal number of prenatal care visits recommended by the Public Health Service's Expert Panel (11) but more likely than women with traditional Medicaid providers. In CPSP, the proportion of women who received above the minimal amount of prenatal care was significantly lower than in OB Access (adjusted OR 1.74; CI 1.56, 1.93), but significantly higher than in Medicaid (adjusted OR 0.77; CI 0.71, 0.84) (table 3). About three-quarters (72 percent) of the CPSP women returned for at least eight comprehensive care visits, compared with 66 percent for Medicaid and 83 percent for OB Access.

**Low birth weight outcomes.** Birth weight outcomes for women in CPSP depended on whether or not women attended at least the minimal number of visits recommended for an uncomplicated pregnancy. For women who kept at least the minimal eight recommended visits, the CPSP services were associated with risks of low weight births no different from those for the OB Access pilot project, but better than those for routine Medicaid services. When the low

Table 3. Effects of the Comprehensive Perinatal Service Program (CPSP) associated with utilization of care measures

Dependent variables	CPSP compared with Medi-Cal		CPSP compared with OB Access	
	Adjusted <sup>1</sup> odds ratio	95 percent confidence interval	Adjusted <sup>1</sup> odds ratio	95 percent confidence interval
Late onset of care (5–9 months gestation).....	1.31	1.20, 1.42	0.99	0.90, 1.09
Discontinuity of care (less than 80 percent of expected visits made).....	0.49	0.45, 0.54	1.74	1.54, 1.95
Below minimum amount of care (less than 8 visits).....	0.77	0.71, 0.84	1.74	1.56, 1.93

<sup>1</sup>Models are adjusted for age, parity, marital status, and ethnicity of women.

NOTE: Medi-Cal = California's Medicaid Program; OB Access = Obstetrical Access Demonstration Project.

Table 4. Effects of the Comprehensive Perinatal Service Program (CPSP) associated with low birth weight outcome in groups of women with differences in prenatal care utilization

Dependent variable: infant's low birth weight for groups of women	CPSP compared with Medi-Cal		CPSP compared with OB Access	
	Adjusted <sup>1</sup> odds ratio	95 percent confidence interval	Adjusted <sup>1</sup> odds ratio	95 percent confidence interval
All women (both levels of visits).....	0.90	0.75, 1.08	1.07	0.87, 1.32
8 visits or more.....	0.70	0.54, 0.91	0.94	0.70, 1.27
Less than 8 visits.....	1.25	0.97, 1.61	0.89	0.66, 1.20
8 visits or more adjusted for onset of care and continuity of care.....	0.70	0.53, 0.92	0.97	0.72, 1.31
Less than 8 visits, adjusted for onset of care and continuity of care.....	1.03	0.79, 1.35	0.95	0.68, 1.32

<sup>1</sup>Adjusted as in table 2 plus infant's sex; the models for the last 2 groups of women also were adjusted for onset and continuity of care.

NOTE: Medi-Cal = California's Medicaid Program; OB Access = Obstetrical Access Demonstration Project.

birth weight rates for CPSP (5.3 percent) were compared with those in either the pilot project (5.0 percent) or routine Medicaid (5.8 percent), the differences were not significant ( $P > 0.05$ ). Even adjustments for differences in sociodemographic characteristics and sex of the baby between groups did not yield a statistical difference in low birth weight rates between CPSP and the OB Access project (adjusted OR 1.07; CI 0.87, 1.32), or CPSP and routine Medicaid prenatal care (adjusted OR 0.90; CI 0.75, 1.08) (table 4).

Women in CPSP with at least the eight visits recommended by the Public Health Service, however, had significantly better outcomes than women who received at least eight obstetrical visits in routine Medicaid care. Unadjusted low birth weight rates were significantly lower for women in CPSP who received eight visits (3.1 percent) when compared with those in Medicaid who received at least eight prenatal visits (4.3 percent;  $P < 0.05$ ; see chart). The CPSP low birth weight rate of 3.1 percent for women with at least eight visits was identical to that for such women in OB Access. When these rates were adjusted for sociodemographic differences in the groups, the low birth weight rate for care in CPSP was significantly better than for Medicaid prenatal

care (adjusted OR 0.70; CI 0.54, 0.91) (table 4) and not different than in OB Access (adjusted OR 0.94; CI 0.70, 1.27) (table 4). When the regression model for those with at least minimal amounts of care is further adjusted for prenatal care (onset of care and continuity of care), the low birth weight risks are still significantly lower in CPSP than in Medicaid (adjusted OR 0.70; CI 0.53, 0.92) (table 4). There was no significant difference in low birth weight rates between women in CPSP who had less than eight visits and their counterparts in either Medicaid or OB Access (table 4).

## Discussion

Providing prenatal care to low-income women that both motivates them to return for visits and is associated with improved birth outcomes is a critical objective of public health. Perinatal care ordinarily provided to Medicaid-eligible women in California, as in other States, has generally been associated with low levels of use of care and poor birth weight outcomes compared with both uninsured and privately insured women (3–5). Enhanced perinatal services like those in the OB Access Demonstration Project that grew out of Maternal and Child Health Services,

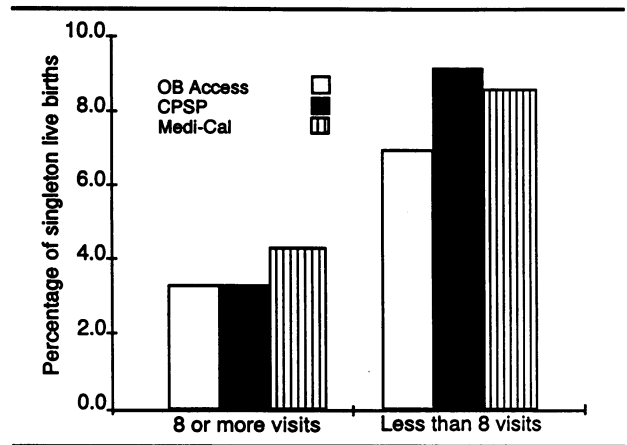
however, were associated with increased use of prenatal care visits and significantly better low birth weight rates (6,7). It is thus important that, in spite of changes made in the services pilot tested in the OB Access project when CPSP was implemented statewide, the program was associated with onset of prenatal care no later, and birth weight outcomes no worse, than in the pilot project. Even though the indicators for the use of care during pregnancy revealed lower use than in the pilot project, they were still higher than those in routine Medicaid care.

Birth weight outcomes, furthermore, were significantly better for the newborn infants of those women who received at least the eight comprehensive care visits recommended by the Public Health Service Expert Panel (11). The birth weight effect remained even after adjustments in the analysis for gestational age at onset of care and gestational age at birth (9,10). Limitations in the data precluded studying the association of the support services which form the basis of the enhanced services with the improved outcomes. But more of the women who attended at least the minimal number of recommended visits also had more support services as indicated by multiple risk assessments in more than one support service area of nutrition, social work, or health education (62 percent compared with 36 percent of women with less than eight visits,  $P < 0.001$ ).

There are still opportunities for improvement in the effectiveness of the CPSP services implemented statewide, particularly in promoting the use of prenatal care (12). Women receiving the services implemented statewide did not start care as early as those who receive routine Medicaid care, and they did not attend as many visits once they started care as did women in the pilot project. Improving service delivery within CPSP to be more like that of the pilot project, therefore, could be expected to improve the amount of return visits.

Nevertheless, measures in addition to those already tried in either the pilot project or the statewide program are needed to improve the early start of prenatal care, since neither set of services had women starting prenatal care as early as women generally did in routine Medicaid care. The Medicaid eligibility process could have contributed to the delay in starting CPSP care if fewer women using CPSP providers were eligible for Medicaid when they became pregnant. In California, a large proportion of women (44 percent) covered by the State Medicaid Program do not become eligible until they are pregnant (4,13). However, the Medicaid eligibility process is not the likely reason for the later onset of care for women in CPSP or the OB Access pilot project, since there was

Percentage of low birth weight infants (unadjusted rates) of women in three study groups



NOTE: The difference between the Medi-Cal women and the OB Access and CPSP groups was statistically significant at the  $P < 0.03$  level.

a 'presumptive eligibility process' for women in the pilot project whereby a woman was presumed eligible if her stated family income was below the allowable limits. Thus it appears that a major source of delay of prenatal care may still have to do with the knowledge and attitudes of women toward the pregnancy, providers, or preventive medical care itself (14,15).

Improvements are also needed in motivating more women to participate in even the minimal number of recommended prenatal visits. In CPSP services, 72 percent of Medicaid eligible women obtained at least eight visits compared with 66 percent of women whose primary payer source for prenatal care was Medicaid. Although the difference was statistically significant ( $P < 0.01$ ), more than one-fourth of the women with enhanced services received less than the minimal recommended number of visits during pregnancy. The newborns of these women were more than twice as likely to be low birth weight than the children of women who had at least the minimal number of visits. Although some of this added risk is because of early preterm births to women with associated insufficient time for eight routine visits, not all of the added risk can be explained this way (16). Many in this group of women who apparently were not sufficiently motivated by CPSP to come for enough care to benefit from it.

In multivariate logistic regression analyses not included in this paper, we found that CPSP women most likely to receive less than basic levels of care were African Americans, Latinas, and unmarried women. Women in metropolitan areas were less likely to receive minimal levels of care than women in nonmetropolitan areas. CPSP women receiving care at health departments were significantly more

*'Evaluation of the public health agency pilot project demonstrated that recipients of enhanced services did not start prenatal care earlier, but they did return for more prenatal visits and had significantly better birth weight outcomes than women in routine Medicaid care.'*

likely to get basic levels of care than CPSP women with other provider types (physicians' offices, community clinics, public or private hospitals).

The primary limitations of the study lie in the lack of randomization of the pregnant women to the different systems of care compared. The lack of random assignment of women to prenatal care groups in effectiveness studies always raises the possibility of self-selection biases contributing to the outcomes. However, Medicaid-eligible women do not select CPSP providers or services. Once women have started care with a CPSP provider, they can refuse the initial support service assessments and thereby exclude themselves from CPSP care at a site, but there is no marketing of the program or of CPSP providers to Medicaid eligible women, nor is there an enrollment process for CPSP. The enhanced services are the standard of care for Medicaid-eligible women with the specially certified CPSP providers.

We could not compare the differences in established risks of low birth weight because we were limited to birth certificate data for women in routine Medicaid care. We were at least able to establish, however, that in our CPSP sample the same proportion (37 percent) of women had identified high risks and returned for more than 110 percent of the visits recommended for an uncomplicated pregnancy as women in the Medicaid sample (37 percent). In randomized clinical trials of similarly enhanced prenatal services, others have reported better birth weight outcomes in nulliparous, but not parous women (17).

The use of birth certificate data for the routine Medicaid care in comparisons with medical chart data for CPSP is an additional limitation of the study. Recording of birth certificate data on the month of onset of prenatal visits and the number of prenatal visits is rarely done with access to a complete medical record of ambulatory care, as was done to obtain information for both the CPSP and OB Access care groups. We were able to estimate biases in birth

certificate data for this study by examining birth certificate records of infants born to women in the CPSP group that had been removed from the Medicaid random sample. We found that, while the later onset of care in CPSP might be attributed to biases in birth certificate data, the improved use of visits in CPSP was less likely to be attributable to this potential source of error.

For the 104 CPSP women whose infants' birth certificates were removed from Medicaid sample, 36 percent were found by medical charts to have started care after the fourth month of pregnancy, whereas only 29 percent were found to have done so by their birth certificate data. In the entire study, 35 percent of CPSP women were found by medical charts to have started care after the fourth month of pregnancy, and 29 percent of the Medicaid random sample were found to have done so by their birth certificate data.

When the threshold measure of prenatal care use is compared for the two types of data sources, 27 percent of women were found to have kept less than the minimal eight visits by medical chart audit but only 20 percent by birth certificate data. For the whole CPSP sample, however, 28 percent of women kept less than eight visits, as did 34 percent of women in routine Medicaid prenatal care. Thus while biases in birth certificate data reporting do appear to explain differences in the onset of care between both CPSP and its pilot project when compared with routine Medicaid care, they do not appear to explain differences found for the use of care between the groups.

This study has demonstrated that the transfer of enhanced perinatal services from the jurisdiction of direct services of maternal and child health agencies to Medicaid benefits, even on a statewide basis, need not necessarily lead to a deterioration in the use of services and outcomes if done carefully. Besides California, New York is also undertaking such a transition of multidisciplinary services, and other States can be expected to do so also. However, it is important to note that a number of functions were not transferred from the Maternal and Child Health Branch when CPSP was implemented as a Medicaid benefits program. In the State of California, the agency certifies providers, oversees provider service delivery, and trains support personnel involved in delivery of services. In addition, Medi-Cal provided enhanced reimbursement for the support services and packaged a variety of financial incentives for performing all initial risk assessments within the first month of care, starting prenatal visits in the first trimester, and providing at least 10 visits. Thus there were a number of safeguards in the implementation



process to assure a certain level of accountability for the enhanced services.

During the implementation it became clear that the differences between the pilot project and the statewide implementation of the services stemmed from the fundamental contrast in purposes of the pilot project and statewide program: the pilot was concerned with providing the highest quality of services possible at a limited number of sites, but the statewide efforts are aimed at providing the highest quality possible at the most sites possible. Administrators of the OB Access project were able to focus on the content and delivery of the services, while CPSP struggles with competing goals of expanding provider participation and maximizing the chances that they will provide the quality of care intended under the program.

Problems arise in implementation because administrative measures designed to assure the quality, such as the application process for certification, are perceived by providers as burdensome bureaucratic interference. On the other hand, measures to expand provider participation, such as reducing paperwork and increasing flexibility in staffing credentials, are feared by officials and advocates for low-income women and children because they could erode the expertise in the services, particularly support services, delivered. The balancing of these two competing goals becomes the key to how effective the services are in the end.

Evaluating effectiveness of health care services in practice has become a high priority of Federal agencies in recent years, particularly for publicly funded care like that of Medicaid financed care (18). The limitations of randomized controlled trials for establishing effectiveness of care have recently become widely recognized (19). While effectiveness studies, such as this one, have limitations, they are useful because they do not eliminate the types of patients usually treated in the real world of clinical practice, as frequently occurs in randomized trials. This study indicates the importance of continuing to monitor health service use and effectiveness even when the services have been tested previously in a pilot project. The study revealed that the use of the services and their associated outcomes are good enough to justify continuation of the program, but important aspects of the service delivery and outcomes should be improved.

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