Part II

Prevention of Childhood Illness: Selected Topics

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Prenatal Care

INTRODUCTION

Prenatal care is a type of health care aimed at improving and maintaining maternal and child health. ' Such care is provided at the earliest possible point—during pregnancy—and thus has the potential for significantly shaping the health of a human being from the very beginning.

The chapter summarizes a wide variety of information on prenatal care. First, it reviews the recommendations of the United States' and other countries' professional groups regarding the content of prenatal care. Then, it reports information on the timing and frequency of visits among subgroups of the U.S. population. Previous studies examining the effectiveness and cost-effectiveness of prenatal care are critiqued and findings summarized. This chapter also presents the findings of OTA's cost-effectiveness analysis of expanding Medicaid to all pregnant women in poverty. The concluding sections of the chapter analyze the role of third-party payment in facilitating access to prenatal care and discuss the implications of OTA's analysis for public policy.

'Prenatal care consists of health services delivered from conception to labor. Related services include *intrapartum care* (received during labor and delivery) and *postpartum care* (rendered immediately following delivery to the sixth week after birth). Prenatal care and intrapartum care combined are referred to as *maternity care.* Definitions of the period for *perinatal care* vary, but in general, this period overlaps the pre- and post-delivery date by several weeks.

RECOMMENDED COMPONENTS OF PRENATAL CARE

Prenatal care encompasses a wide range of preventive, diagnostic, and therapeutic services delivered throughout the course of pregnancy with the goal of both a healthy baby and a healthy mother. The actual care that pregnant women receive varies widely, depending on the number of visits the woman has, as well as on the specific interventions that are applied. Preventive interventions include screening for potentially harmful conditions in the mother and fetus, education and counseling, and sometimes nutritional supplements, Diagnostic and therapeutic interventions represent responses to and followup of problems identified either through symptoms or screening.

Photo credit. March of Dimes *Birth Defects Foundation*

Although early and comprehensive prenatal care is clearly effective, the specific components that make a difference are not fully understood.

Various professional groups in the United States and other countries have provided guidelines for the content of prenatal care, particularly for the preventive elements of such care.[2] Available guidelines cover the prenatal visit schedule, specific assessment and screening procedures, edu-

[2]For a discussion of recommendations b, professional groups and experts in the United States, Canada, and Great Britain, see the background paper prepared for OTA by Lorraine Klerman and Helen Burst, entitled "Evidence of the Effectiveness of Recommended Antepartum Care Components" (341).

cation and counseling activities, and nutritional supplementation. The guidelines issued jointly by the American College of Obstetricians and Gynecologists (ACOG) and the American Academy of Pediatrics (AAP) (22,25) call for prenatal care visits to begin as early in the first trimester of pregnancy as possible and to continue every 4 weeks until the 28th week, every 2 to 3 weeks thereafter until the 36th week, and weekly thereafter. This schedule translates into 13 to 15 prenatal visits over the course of a normal pregnancy of between 37 and 40 weeks gestation.

The visit schedule recommended by the Canadian Task Force on the Periodic Health Examination is the same schedule as that of the Americans ***(89,90).*** The Royal College of Obstetricians and Gynecologists (RCOG) in Great Britain, on the other hand, recommends substantially fewer visits for women with normal pregnancies, The RCOG schedule calls for a total of seven to nine prenatal visits at various points in pregnancy and beginning at 12 weeks gestation (552). This schedule is based on the concept of "shared antenatal care, " in which responsibility for providing services is shared among obstetricians, general practitioners, and midwives. Only three of the nine recommended visits in the RCOG schedule involve an obstetrician. The rest are handled by a combination of the general practitioner and midwives.

For some specific services, there is widespread agreement among the American, Canadian, and British professional societies. The need for determining blood group and screening for antibodies in Rh-negative women, for example, is something that all groups recognize. Screening for syphilis and gonorrhea at the initial visit is another thing they all recommend (341). For other tests, however, there is substantial disagreement about policy among the countries' professional societies. Thus, for example, the use of ultrasound is not recommended as a routine screening examination in pregnancy by the American or Canadian groups, but is recommended by the British at 16 to 18 weeks gestation. The Canadian Task Force on the Periodic Health Examination is the only group that currently recommends routine testing of all pregnant women for chlamydial infections.

The differences among the various professional groups' recommendations reflect in part a lack of definitive evidence regarding the incremental contributions of additional prenatal interventions or visits at particular points in pregnancy. They also reflect the philosophies of the different health systems in which the professional groups practice. In addition, as advances in medical technologies alter both the effectiveness and cost of services, professional standard-setting groups may react at different speeds to new evidence. One new technique for which evidence is only now accumulating, for example, is called "ambulatory tocodynamometry." This technique allows noninvasive ambulatory monitoring of uterine contractions in women at risk for premature labor and may enhance the effectiveness of the available therapies to reduce the incidence of premature birth (see app. F). So far, no professional society has issued guidelines regarding its use.

Professionals disagree not only about the amount and content of prenatal care visits for normal pregnancies, but also about which pregnancies are high-risk and how these should be handled. Women with medical histories or conditions that suggest elevated risk obviously justify closer monitoring during pregnancy than other women do, but there are no widely agreed upon guidelines for the appropriate scope of services under each circumstance. Neither are there generally accepted standards for women who are at elevated risk of poor outcomes because of social or demographic risk factors (e. g., adolescents or poor women).

The lack of generally accepted standards for the content of prenatal care for high-risk women reflects the conflicting evidence about the importance of specific interventions. Later in this chapter, OTA reviews the evidence on the effectiveness of prenatal care in improving birth outcomes, but it is important to note that that evidence is limited to assessments of the effect of earlier and more frequent prenatal visits on birth outcomes or of the effect of programs that offer packages of augmented prenatal care services to women in demographically defined high-risk groups. The precise content of the care that is offered is often undocumented.

USE OF PRENATAL CARE

How closely do American women adhere to U.S. professional groups' recommendations for the timing and frequency of prenatal care? In *1984, 20* percent of white babies and 39 percent of black babies in the United States were born to mothers who had not had their first visit for prenatal care by the end of the first trimester of pregnancy *(712).* The mothers of 5 percent of white and 10 percent of black babies born in 1984 had not had a prenatal care visit before the 7th month of pregnancy (712). From 1981 to 1984, the percentage of women obtaining late or no prenatal care in this country increased: for blacks, the percentage increased from 9.1 percent in 1981 to 10 percent in 1984; for whites, the percentage increased more modestly—from 4.3 percent in 1981 to 4.6 percent in 1984.

Most mothers of both races in the United States fail to receive the 13 to 15 prenatal visits recommended by American professional groups. Among mothers with full-term pregnancies, only 33 percent of whites and 23 percent of blacks had 13 or more prenatal visits in 1984 (712).

The timing of the first prenatal visit varies widely among different U.S. population subgroups. Ingram and colleagues compared 10 groups of women defined by race, marital status, maternal age, and educational attainment in 5 years between 1970 and 1983 (295). Unmarried teenagers with less than a high school education were the least likely to obtain early prenatal care, while older married mothers with more than a high school education were the most likely to obtain it. These findings held for both whites and blacks. Thus, for example, in 1983, about 45 percent of unmarried teenagers who did not graduate from high school initiated prenatal care in the first trimester of pregnancy; the comparable figure for older married mothers with more than a high school education was 80 percent.

As expected, poverty status is also related to American women's use of prenatal care services. In 1980, two-thirds of women with family incomes below 150 percent of the U.S. poverty level initiated care in the first trimester, as compared to over 80 percent of those with higher family incomes (598). Similarly, women with low incomes were three to four times more likely to receive late or no prenatal care than women with incomes above 150 percent of the poverty level.

To summarize, the receipt of early and frequent prenatal care by American women varies widely depending on the demographic and economic group to which a woman belongs. To the extent that early and frequent prenatal care affects the outcome of pregnancy, these variations contribute to the observed intergroup differences in rates of low birthweight and infant mortality. Although it appears that the majority of American women actually make fewer visits for prenatal care than is recommended by American physician groups, the differentials by income, age, race, and education suggest that targeting effective prenatal care services to the women in high-risk groups holds promise for improving pregnancy outcomes.

EFFECTIVENESS OF PRENATAL CARE

This section summarizes the evidence on the effectiveness of prenatal care in altering two critical aspects of infant health: low birthweight and neonatal mortality. Low birthweight (under 2,500 grams) is a good predictor of infant mortality (see ch. 2) and is also associated with high rates of chronic and disabling illness and costly medical care, Neonatal mortality, independent of birthweight, is also a good indicator of the overall health of newborns and maybe directly affected by the nature of prenatal care that women receives

Because prenatal care includes not only preventive interventions such as screening and counsel-

[3]Low birthweight and neonatal mortality are both strongly correlated with another outcome measure—premature birth (defined as birth at 37 weeks gestation or earlier). This measure of outcome is problematic, however, because current methods of dating gestational age are imprecise and are also improving over time.

ing but also treatment when needed, it is bound to be effective in altering the health of some mothers or infants. Treatment of gestational diabetes or hemolytic disorders, for example, is critical to healthy outcomes for both mother and infant. Yet, if frequent routine screening for a particular condition does not offer any advantage in terms of allowing more effective treatment or better management of labor and delivery than would seeking care when symptoms develop, the value of such screening is dubious. Thus, the real question of effectiveness is not whether prenatal care makes any difference to child health, but exactly which preventive measures—monitoring, screening, education and counseling, or nutritional supplements—are effective and at what intervals in the course of a normal pregnancy they are most effectively applied.

This question can be addressed at various levels of detail, ranging from examination of every possible preventive component of each prenatal care visit to a general assessment of the effects of more care v. less care, as measured by the number of prenatal visits, early initiation of care, or receipt of enriched services through special programs. Although an overall assessment of the effectiveness of prenatal care would ideally build on evidence regarding individual components, it is beyond the scope of this assessment to examine the effectiveness of individual components.[4] Instead, the large body of evidence accumulated on the impact of early, more frequent, or enriched prenatal services on low birthweight and neonatal mortality will be the basis for this analysis,

Problems in Interpreting the Evidence

An ideal study of any prenatal care regimen would be prospective, with randomized assignment of patients to experimental and control groups. This ideal is rarely achieved in practice, however, because it would be unethical to withhold early or frequent prenatal care from women seeking it. Even in programs offering enriched services, randomized assignment is rarely achieved. In only one published study—a comparison of a program of home visits with standard prenatal care (469)—were subjects randomly assigned to experimental and control groups. All other studies of the impact of prenatal care on infants' health depart to one degree or another from the experimental ideal.

Not surprisingly, then, the validity of all studies of the impact of prenatal care on infants' health is questionable to some degree. The critical threat to validity is the problem of self-selection bias—i.e., the likelihood that women who seek more care, earlier care, or enriched services are inherently different in terms of their health risks from women who do not.

Two kinds of self-selection bias exist in studies of prenatal care. The most familiar form of self-selection bias follows the logic that women who seek prenatal care early and often routinely behave in healthy ways, of which early receipt of prenatal care is but one reflection. Women who receive earlier and more prenatal care, for example, may also be less likely to smoke cigarettes or abuse alcohol (218). These women are probably healthy on the whole and thus are likely to be at lower than average risk of poor outcomes. A study in which this kind of "favorable selection" operates would tend to *overestimate* the effectiveness of prenatal care.

The second form of self-selection operates to bias the results of a study in the opposite direction. In this case, women who experience a problem with their pregnancy or have information that leads them to expect problems (e.g., a poor pregnancy history) would tend to seek care early and often. These women are likely to be at higher than average risk of poor outcomes. A study in which this kind of "adverse selection" occurs would tend to ***underestimate*** the effectiveness of prenatal care.

As a consequence of self-selection bias, simple comparisons between users and nonusers of prenatal care, or between more frequent and less frequent use, are unacceptable. Researchers have

[4]The Public Health Service has established an expert panel on the content of prenatal care, with the objective of examining the usefulness of specific components of prenatal care. The work of the panel is currently in progress, For other information on the effectiveness of individual components of prenatal care, see the background paper prepared for OTA by Lorraine Klerman and Helen Burst reviewing the evidence on effectiveness of chlamydia testing, routine ultrasound screening, smoking cessation programs, and nutritional supplementation ***(552).*** The effectiveness of ambulatory tocodynamometry, a new technique for detecting premature labor in high-risk women, is discussed in app. F in this report.

used various methods to control for self-selection bias. Some use multivariate techniques in which variables thought to be associated with favorable selection (e. g., income, education, smoking behavior) and adverse selection (e.g., preexisting health problems, complications of pregnancy, prior fetal or infant death) are entered into the analysis as control variables along with measures of prenatal care use. In studies of programs of enriched care, pregnancy outcomes of women who are eligible for a program are often compared with those of a group of similar but ineligible women. If carefully selected, the comparison group can provide reasonable validity. Nevertheless, the question always remains whether the self-selection bias has been adequately controlled in all such studies, and lacking a gold standard by which such adjustments can be judged, one can never be completely confident that a study's results are valid.

Thus, although there is a substantial body of literature on the effectiveness of prenatal care, the interpretation of this literature ultimately requires judgments about its validity. Individuals who would apply the strictest standards of validity probably would not accept any of the evidence—whether pro or con—as sufficient. Yet policy decisions regarding prenatal care need to be made even in the face of imperfect information. Therefore, OTA has taken a somewhat more relaxed position with regard to validity. The findings of more than 55 studies of the effectiveness of prenatal care need not be ignored because they only imperfectly control for self-selection biases. Rather, each study can be assessed both for the degree to which it has successfully controlled for these biases and for the strength of its findings. The results of such an assessment are summarized below.

Studies of the Effectiveness of Prenatal Care

Studies of prenatal care fall into two general categories:

1. those based on birth and death records (i.e., vital records); and
2. those evaluating programs offering enriched or augmented services.

Studies in the first category have the advantage of large sample sizes, but these databases offer limited information on prenatal care use and mothers' characteristics; typically, information on prenatal care use is limited to number of visits or trimester in which care began. Studies in the second category often use well-selected comparison groups and sometimes have access to more extensive information on patterns of prenatal care use; however, these evaluations typically compare care that is generally available to women in the community with more comprehensive programs, and it is difficult to generalize from these studies about the value of more v. less prenatal care of the kind generally available.

Studies Based on Vital Records

Numerous studies of births and deaths in hospitals, cities, counties, States, and the Nation as a whole have found a positive relationship between the use of prenatal care and birth outcomes. Of 21 multivariate studies of the effect of prenatal care on birthweight that controlled in some way for maternal demographic or medical risks, for example, 18 found evidence of a statistically significant positive effect in at least some groups of women. (See table G-1 in app. G for detailed descriptions of these studies.) Similarly, of 15 controlled studies of the effects of prenatal care on neonatal mortality, 11 found a statistically significant negative relationship between neonatal mortality and the use of prenatal care. (See table G-1 in app. G.)

Among studies finding that prenatal care had a positive effect on birth outcomes, the size of the effect varied widely because of differences in measures of prenatal care and control variables selected for the analysis. A 1981 study of births in Baltimore, Maryland, that controlled for several demographic and medical risk factors found, for example, that women who received adequate prenatal care[s] were about 1½ times more likely to deliver normal weight babies than those who did not (573). Another study of births in 1977 that controlled only for mother's race and education found that mothers receiving no prenatal care

[s]Adequate care was defined by an index of adequacy of care first developed by Kessner (328) and modified by others.

were 2½ times as likely to deliver a low birthweight baby (227a).

Five recent analyses of prenatal care using data from vital records have applied an analytic technique known as instrumental variables to control for adverse selection bias. These studies uniformly find even stronger positive effects of prenatal care on neonatal mortality and birthweight than are found with traditional multivariate techniques. (See table G-2 in app. G for a summary of studies using instrumental variables.) Because these studies generally do not adequately control for favorable selection bias, however, they can be expected to overestimate the effects of prenatal care on birth outcomes.

Studies of the Effectiveness of Programs Offering Augmented Prenatal Care

For the past 20 years, a number of Federal and State-initiated programs have offered prenatal care services that differ in scope and mix of services from those routinely available in the community. These programs typically offer a variety of supplementary services to target groups of high risk women, usually teenagers or poor women. For example, Maternity and Infant Care projects, the Improved Child Health Project, and Improved Pregnancy Outcome projects were established by the Children's Bureau and through Title V of the Social Security Act of 1935 to improve the delivery of care to the generally high-risk and underserved populations of poor women and adolescents (128,212,395), State initiatives with similar goals, such as the Obstetrical Access Project in California (615) and other local and hospital-specific programs were also established. These programs were developed to address unequal access to prenatal services or a perceived need for more comprehensive care for high-risk women. In addition to providing routine medical services during pregnancy, these initiatives include a wide variety of supplementary services such as outreach, [7] formal education and counseling, coordination of auxiliary support services, transportation to and from medical visits, and/or home visitation.

OTA found 25 studies of the effectiveness of programs offering augmented prenatal care services. (See table G-3 in app. G.) The target groups for the majority of these programs are teenagers or poor women. Most studies compare the outcomes of births to women enrolled in a particular enriched care program with the outcomes observed in a selected comparison group of women receiving care elsewhere. Thus, these studies examine the incremental benefit of augmented care over and above services received by the comparison group.

The studies of the effectiveness of augmented prenatal care programs have found that publicly funded comprehensive prenatal care programs, such as Maternity and Infant Care projects, the Improved Child Health Project, and Improved Pregnancy Outcomes projects, increase the use of prenatal care among certain groups of poor women and adolescents. More pregnant women get care early and often through these programs, Studies of augmented prenatal care programs, however, show a less consistent effect on birth outcomes than was found in studies based on vital records data. Some significant findings were observed for specific subgroups of the target populations, such as adolescents and women at high risk for poor pregnancy outcomes. For example, four of six studies of augmented services for pregnant adolescents found that such care reduced the frequency of low birthweight and premature births. For teenagers and women at high risk, Maternity and Infant Care projects, the Improved Child Health Project, and Improved Pregnancy Outcomes projects may provide an appropriate mix of routine and specialized care. Poor women at average or low risk, however, may not receive much incremental benefit from these comprehensive programs over and above the benefit of the care they would routinely receive.

[6] In general, the instrumental variables technique attempts to correct for adverse selection bias by replacing the observed value of prenatal care with a predicted value derived from a regression of prenatal care on explanatory variables that are uncorrelated with the health status of the mother. Thus, the predicted prenatal care variable is also assumed to be uncorrelated with health status. This predicted prenatal care variable is then used in a second-stage regression to predict its effect on the outcome of pregnancy.

[7] Outreach generally means two types of services that have different goals: to increase access and/or to improve medical care compliance. For example, in some programs, outreach refers to efforts to enroll pregnant women early in gestation. In other programs, outreach focuses on getting enrolled patients to keep their appointments and to follow medical regimens or advice.

The relationship between early or more frequent prenatal care and birth outcomes appears to be much more tenuous in this group of studies than it was in the studies based on vital records, Some of the studies of augmented care found improvements in the initiation of care among program participants but no effects of the program on birth outcomes. OTA analyzed 17 studies of programs for poor women or teenagers for which information on either outreach services or time of initiation of care was available for both an experimental and comparison group (see table 4-1). Overall, only about one-half of these 17 studies found that augmented prenatal care services had significant impacts on birthweight or neonatal mortality. In 7 of the 17 programs, the experimental group receiving augmented services initiated prenatal care earlier than the comparison group; in 4 of the 7, augmented prenatal care was found to have significant positive effects on birth outcomes. Of the 17 programs offering augmented prenatal care services, 11 appeared to have an outreach component designed to enroll women into care early in their pregnancies. Information on when care began was available for 9 of the 11 programs. Six of the nine were successful in bringing more women into care early, but only three of the six with successful outreach and other supplementary services showed an impact on birth outcomes.

One reason for the lack of consistent results among the studies may be that the studies represent a diverse mix of prenatal interventions with different levels of effectiveness. Even under the rubric of Maternity and Infant Care projects, for example, services delivered in one geographic area may be quite different from those provided in another.

In many studies, no information was provided regarding the scope of services received by *comparison* groups. Investigators assumed that women in the comparison group received less care than women in the augmented programs. In fact, because the comparison groups also tend to comprise poor women, some of them may have been enrolled in comparable programs of specialized care. Thus, in some studies the differences between the augmented care and comparison services may not have been great.

Table 4-1 .—Summary of 17 Selected Studies of the Effects of Programs Offering Augmented Prenatal Care[a,b]

	Impact on initiation of care			
Program characteristics	No differences between comparison and experimental group	Difference favors experimental group	No information	Total number of studies
Outreach and extra services:				
Number of studies	1	4	0	5
Number with significant effect on birth outcomes[c]	0	1	0	1
Extra services (may include outreach):				
Number of studies	2	2	2	6
Number with significant effect on birth outcomes[c]	2	2	0	4
Extra services only:				
Number of studies	1	1	4	6
Number with significant effect on birth outcomes[c]	1	1	2	4
Total number of studies	4	7	6	17
Total number of studies with significant effects on birth outcomes[c]	3	4	2	9

[a]Programs Offering augmentedprenatal care are programs that provide supplemental services in addition to Prenatal medical care These programs provide one or more of the following types of special services outreach, transportation, nurse home visitation, nutrition and social services, health education, followup of missed appointments, case management/coordination of services, and dental care

[b]This table displays results from 17 of the 25 studies of augmented prenatal care programs that appear in table G-3 in app G of this report Eight Of the twenty-five in table G-3 were *excluded* from this table for the following reasons 1) the study did not include a comparison group that received an alternative form of care, 2) the study examined employee-based health maintenance organization programs of care, or 3) the study did not report information on outreach *and* Initiation of care

[c]Birth outcomes include low birthweight and neonatalmortality

[d]Outreachin this context means efforts to bring patients Into care early inpregnancy

SOURCE Office of Technology Assessment, 1988

The most important explanation for the mixed results is the limited power of the experiments. The power of a statistical test—i.e., the probability that a specified difference between the experimental and comparison groups will be detected in the experiment—depends on the significance level selected, the size of the effect that one wishes to detect, and the sample size (113). Very large sample sizes are needed for adequate power to detect a small but potentially important difference between program participants and nonparticipants. Most studies do not have a large enough sample size to detect a difference in birthweight of the magnitude required for the costs of prenatal care to be outweighed by savings in the costs of treating low birthweight babies. [a]

Six studies referred to in table 4-1 examined augmented programs that included extra services but no outreach aimed at getting women into care early. Four of the six showed significant effects on birth outcomes. These findings suggest that provision of extra services to adolescents and high-risk women may be effective in improving birth outcomes. In some cases, the availability of supplementary services appears to compensate for failure to improve patterns of initiation of prenatal care. For example, home visit services may be a key component of augmented care. Although the evidence is limited, such services for adolescents and high-risk women appear to improve birth outcomes, especially birthweight (169,433,469,725).

[a]To illustrate, OTA conducted a power analysis on data presented in Peoples, et al. (486). That study examined an augmented care program that succeeded in bringing more black women into care early; however, no significant difference in the low birthweight rate was found between the experimental and comparison groups. Applying conventional levels of statistical significance and power (0.05 and 0.80 respectively), OTA found that, given the observed differences in the use of first-trimester care, the Peoples, et al., study would need a minimum of 10,000 participants in each group to detect a difference in low birthweight rates equal to that detected by Joyce (i.e., every l-percent increase in the number of women receiving first-trimester care decreases the low birthweight rate by *0.045* percentage points)(311). The actual sample sizes in the Peoples, et al., study ranged from 297 to 1,254.

Conclusions About the Effectiveness of Prenatal Care

The weight of the evidence on the effectiveness of prenatal care, both from studies based on vital records and from studies of programs offering augmented prenatal care services, supports the contention that birth outcomes can be improved with earlier or more comprehensive prenatal care. Indeed, given the design problems inherent in many studies of programs offering augmented services, it is noteworthy that so many of them did detect effects on birthweight or neonatal mortality. The evidence appears to support the value of both early and frequent prenatal care and the provision of enhanced services to adolescents and high-risk women.

Although the evidence clearly supports the effectiveness of prenatal care, it is less revealing about the size of the effect that can be expected from increasing the quantity or quality of prenatal care received by any segment of the population. The studies based on vital records data control for self-selection biases to varying degrees and only very imperfectly at best; one cannot know how strong the two opposing biases (adverse and favorable selection) are or to what extent each has been accounted for in any study. The next section presents OTA's analysis of the effect size required if an expansion of Medicaid prenatal care benefits to all pregnant women in poverty is to pay for itself in net savings in U.S. health care costs. That effect size is then compared to the findings of several reasonably well-designed effectiveness studies to ascertain how reasonable it is to expect such an effect.

COST-EFFECTIVENESS OF EXPANDING MEDICAID TO ALL PREGNANT WOMEN IN POVERTY

If prenatal care can improve birth outcomes, the logical next question is whether a specific strategy to increase access to effective services is worth its costs. OTA examined the net effect on health care costs of expanding Medicaid eligibility to all pregnant women in poverty in 1986.[b] The Om-

[b]Other studies of the cost-effectiveness of prenatal care have examined the net costs of strategies involving augmented services or

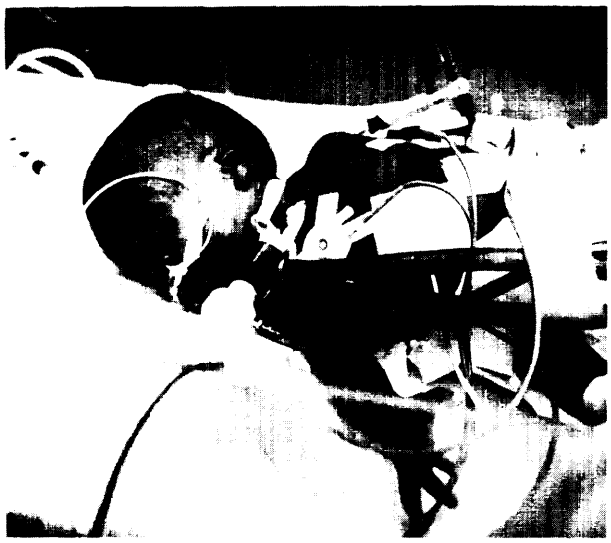


Photo credit March of Dimes Birth Defects Foundation

Some of the costs of treating low birthweight babies with neonatal intensive care can be prevented with early prenatal care.

nibus Budget Reconciliation Act of 1986 (OBRA-86) (Public Law 99-509) gave States the option of expanding eligibility to pregnant women whose family incomes are below the U.S. poverty level but above the State's Aid to Families With Dependent Children (AFDC) standards of need (420). By January 1, 1988, 26 States had elected to exercise that option (271a).

OTA's analysis presented here is concerned with the net costs or savings of expanding eligibility that accrue to the U.S health care system as a whole, not solely to the Medicaid program. Although Medicaid program administrators must be concerned with budgetary impacts of their policies, the most appropriate stance from a policy perspective is to assess the net costs of a specific strategy to society—not to a particular program. In the case of a program extending Medicaid benefits to all pregnant women in poverty, Medicaid would pay for services that had previously been paid for by patients, private insurers, philanthropic organizations, other government agencies, and providers themselves. These transfers of responsibility for payment are not trivial,[10] but they cannot be the sole or even principal guide for public policy.

Because low birthweight is such a costly condition to treat, both in the short run (with neonatal intensive care) and in the long run (with services to chronically ill and disabled children), the costs of prenatal care must be considered against the potential savings in these treatment costs from reducing low birthweight. Thus, the potential for saving net health care costs depends in a critical way on the estimates of effectiveness of prenatal care used in the analysis. Although available evidence generally supports the contention that early or more prenatal care does improve birth outcomes, it does not provide unequivocal quantitative estimates of the effect of prenatal care on low birthweight.

OTA's approach in this analysis, therefore, was to calculate the reduction in the rate of low birthweight that would be necessary to balance the extra prenatal care costs with equal savings in the short- and long-run costs of treating low birthweight children. This figure was then compared to the evidence on the effectiveness of prenatal care to determine whether the level of effectiveness required for costs to be outweighed by savings is reasonable to expect from the Medicaid expansion strategy. If expansion of prenatal care to all pregnant women in poverty is not cost-saving to the U.S. health care system, its costs would then need to be weighed against its effectiveness in saving lives and preventing the chronic illness and disability that is associated with low birthweight.

OTA's analysis has three major components:

- the impact of expanded Medicaid coverage on the use of prenatal care by pregnant women in poverty,
- the extra costs of providing the additional prenatal care, and
- the savings associated with prevention of a low birthweight birth,

Each is discussed below.

expanded benefits to pregnant women. Most such studies look at net costs to a public program (e. g., Medicaid) and are based on estimates of effectiveness taken from a single study. See table C-4 in app. G for a review of cost-effectiveness studies of prenatal care.

[10]The Medicaid program costs associated with this policy were estimated by the Congressional Budget Office (649).

Impact of Expanded Medicaid Coverage on the Use of Prenatal Care

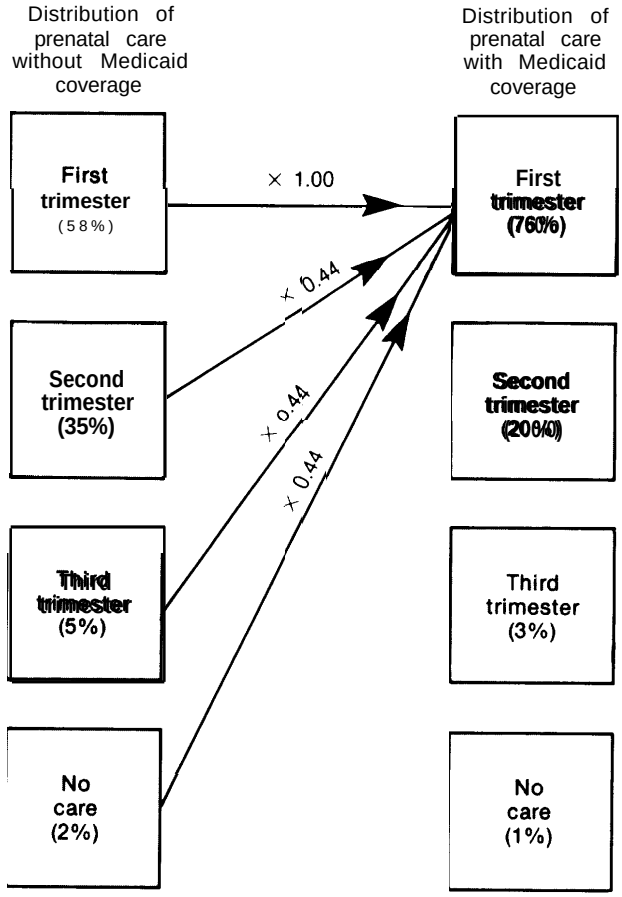
The Congressional Budget Office estimated that 194,000 pregnant women with incomes below the poverty level would become eligible for Medicaid if all States adopted the option under OBRA-86 (649). About 113,000 of these women would carry private insurance, and the other 81,000 would be uninsured .11

There are numerous ways to measure changes in the amount and quality of prenatal care consumed, but OTA's analysis focuses on increases in the frequency of care in the first trimester of pregnancy. Information on the use of prenatal care by poor women was drawn from the 1982 National Survey of Family Growth (708).

Figure 4-1 summarizes the assumptions made in OTA's analysis about expected changes in the frequency of first-trimester care for the target population as a whole .12 The left-hand column shows the approximate distribution of care by trimester in the target population without expanded Medicaid coverage. Among women in the target population, *42* percent do not get first-trimester care. OTA assumed that 44 percent of these women would shift to first-trimester care if they were eligible for Medicaid. 13 Equal percentages of those originally receiving second- and third-trimester care or no care were assumed to shift to first-trimester care.[14] Overall, 18.5 percent of the target population (0.42 X 0.44) who would otherwise not obtain first-trimester care would begin care in the first trimester if they became eligible for Medicaid.

OTA assumed that all changes in the pattern of prenatal care use would be shifts to first-trimester care. No adjustments were made for shifting from third-trimester care to second-trimester care, for example. These assumptions

Figure 4-1 .—Assumptions in OTA's Base Case Analysis About Changes in the Use of First-Trimester Prenatal Care



SOURCE: Office of Technology Assessment, 1988

[11] Prior to gaining Medicaid eligibility, pregnant women in the target population would either be covered by private insurance or uninsured. For women with private insurance, Medicaid would pay for maternity services not covered by private plans and all coinsurance and deductible amounts. For the uninsured, Medicaid would cover all maternity care. The Congressional Budget Office assumed that 90 percent of the women without private health insurance and *60* percent of those with private insurance would enroll in Medicaid *(649).*

[12] The 1982 National Survey of Family Growth divided women into five categories according to source of payment for delivery. Three of these categories were relevant to OTA's analysis: the privately insured, the uninsured, and Medicaid recipients. The OBRA-86 target population comprises privately insured (58 percent) and uninsured women (42 percent). On the basis of National Survey of Family Growth data, OTA computed a weighted average of first-trimester use by privately insured and uninsured women to estimate first-trimester use in the target population as a whole.

[13] According to other data from the 1982 National Survey of Family Growth (708), 44 percent of Medicaid recipients get first-trimester care.

[14] The National Survey of Family Growth data (708) did not separate initiation of care in the third trimester from no care. For cost calculations, OTA made separate estimates of the number of pregnant women in each of these two groups. Based on Texas data for a Medicaid population (399), OTA assumed that *25* percent of those in the third-trimester/no-care group actually received no care.

may have resulted in an overestimation of both the total incremental costs and the effectiveness of prenatal care. (See app. G for further information on expected changes in the use of prenatal care.)

Incremental Costs of Early Prenatal Care

To estimate the incremental costs of providing early prenatal care to the new users, OTA assumed that prenatal care commencing in the first trimester of pregnancy would include 3 more visits than prenatal care beginning in the second trimester; *6* more visits than prenatal care beginning in the third trimester; and 12 more visits than prenatal care received by women who had previously gone with no prenatal care (312).

OTA estimated the cost of these extra physician visits from a 1986 survey of physician fees (334). The incremental per person cost of first-trimester care over second-trimester care was estimated to be $90; the incremental per person cost of first-trimester care over third-trimester care to be $180; and the incremental cost of first-trimester care over no care at all to be $380.[15]

Using these assumptions, OTA estimated that net national prenatal care costs associated with the additional prenatal care received by the target population in **1986** would be **$4** million.

Savings From the Prevention of Low Birthweight Births

Preventing low weight births saves costly care in the initial hospitalization of low birthweight babies, in subsequent rehospitalizations for which low birthweight babies are disproportionately at risk, in more frequent and intensive health care due to a high incidence of chronic illness and disability in low birthweight babies, and in long-term costs associated with institutional or foster care and special education for more seriously disabled children.

The costs of these kinds of health care cannot be estimated with a great deal of precision. Consequently, OTA estimated a range within which such costs are very likely to lie. The net additional costs incurred in the treatment of low birthweight babies over the costs incurred for normal birthweight babies was estimated for three major categories:

1. costs of initial hospitalization (including hospital costs and physician fees);
2. costs of rehospitalizations in the first year of life (hospital costs only); and
3. long-term costs of institutional care, foster care, early intervention, special education and adult services provided from ages 1 to 35 for surviving disabled low birthweight babies.

Cost of Initial Hospitalization

Data on hospital costs for newborn care by birthweight category are available from the State of Maryland (294).[16] Including both routine newborn care and neonatal intensive care costs, the average cost per hospital stay for a low birthweight infant in 1986 was $5,894 (in 1986 dollars). For babies weighing more than 2,500 grams, the average cost per discharge was $658. Thus, the extra cost of hospital care for a low birthweight baby was $5,236 in 1986.

The results of a recent study have suggested that the costs of neonatal intensive care might be reduced by discharging babies sooner without negative impacts on infant health (72). In that study, the net savings from the program were 25.6 percent of hospital and physician charges. Using these results as a rough guide, the costs of treating low birthweight newborns in the hospital might be reduced by about *25* percent. In that case, the extra costs of initial hospitalization associated with low birthweight might be reduced to ***$3,763.***

[15] The per visit rates (***$50*** for ***an*** initial visit and $30 for each revisit) were based on obstetrician office visit charges, which tend to be higher than similar charges for physicians in other specialty areas who also provide prenatal care (e. g., family practitioners and general practitioners; see ref. ***334 .***). Thus, the costs of prenatal care may be somewhat overestimated given that prenatal care is not exclusively provided by obstetricians.

[16] In 1986, the average hospital cost per admission in Maryland was within one-half percent of the national average cost per admission (493 ***).***

OTA's analysis used this amount as the lower bound of the range of net newborn hospitalization costs.

Not only are costs incurred for hospital care in the newborn period, but costs are also incurred for the visits physicians make to newborn babies in the hospital. Data on physician visits to newborns are not available, but several studies and reports from individual institutions indicate that physician charges for care to infants in neonatal intensive care units lie somewhere in the range of 10 to ***20*** percent of total hospital charges (330,494, 497,736). This range of rates was applied to the Maryland hospital cost data.[17]

Cost of Rehospitalizations

Low birthweight infants have higher rates of respiratory, gastrointestinal, and infectious illness than do infants born at normal weights (411,665). McCormick and colleagues reported on rehospitalization rates by birthweight in the first year of life in eight regions of the country in 1978-79 (411). Nineteen percent of low birthweight infants who survived the first year, as compared to 8.4 percent of normal birthweight babies, were rehospitalized at least once during the first year of life. Days spent in the hospital averaged 2.1 for low birthweight infants compared to 0.7 for normal birthweight infants .18 Thus, each low birthweight birth accounted for an average 1.5 extra days in the hospital after the initial hospitalization.

In 1986, the national average daily cost for a hospital stay was $535 (26). Thus, the extra cost of rehospitalization in the first year was roughly $800 per low birthweight birth. This is a conservative estimate for three reasons. First, the daily cost of an infant's hospital stay is probably higher than the average across all patients, Second, the rates of rehospitalization were based on the experience of children who survived infancy. Those who survived the initial hospitalization but did not survive infancy were likely to have very high rates of hospitalization. Finally, this estimate does not include the fees paid to physicians for visits to rehospitalized infants.

Long-Term Health Care Costs

In addition to the extra burden of short-term medical care associated with these children, long-term costs result from early intervention programs, [19] special education, and, sometimes, institutional or foster care.

OTA's analysis makes certain assumptions regarding the types of care that children will receive over their lifetimes and the costs of that care (as specified below). In particular, it is assumed that:

- all infants surviving at 1 year will survive to age 35, regardless of their level of disability;
- costs of care received are calculated only to age 35;
- the severity of developmental disability as evaluated at age 1 is constant through age 35; and
- the costs of services (i. e., early intervention, special education, and institutional or foster care), by level of disability, are the same as the costs of these services provided to severely and moderately mentally retarded people.

Many assumptions were necessary regarding the kinds of care that disabled children would receive over their lifetimes, the costs of providing different levels of care, and the discount rate that should be applied to costs incurred in more distant years. Appendix G contains a detailed description of OTA's analysis of long-term costs and of all assumptions underlying the estimates of long-term costs. In brief the expected net long-term (until age 35) cost of low birthweight is between approximately $9,000 and $23,000 per birth. Or, restated, the net long-term savings in

[17] Maryland's hospital cost data were converted to charges by applying the statewide ratio of charges to cost. Physician charges were then calculated from that amount.

[18] This estimate is the average across all births, not just survivors. Estimates were adjusted to account for survival rates in the low and normal weight categories.

[19] Early intervention programs are broadly defined by the Education of the Handicapped Act Amendments of 1986 (Public Law 99-4s7) as developmental services provided to handicapped infants or toddlers. These services include: family training, counseling, and home visits; special instruction; speech pathology and audiology; occupational therapy; physical therapy; psychological services; case management services; medical services only for diagnostic or evaluation purposes; early identification, screening, and assessment services; and health services necessary to enable the infant or toddler to benefit from the other early intervention services.

health care costs that would be gained by preventing each low birthweight birth (i. e., by moving it to the normal weight category) lie somewhere in the range of $9,000 to $23,000.

Net Health Care Savings Per Averted Low Birthweight Birth

Table 4-2 summarizes the net incremental costs associated with each low birthweight birth or, alternatively, the net savings associated with the prevention of each such birth. Estimated net savings per averted low birthweight birth range from about $14,000 to $30,000.

Table 4-2.—Net Incremental Health Care Costs of a Low Birthweight Birth

	Low-cost estimate	High-cost estimate
Initial hospitalization cost:		
• Hospital costs	$3,763	$ 5,236
• Physician costs	475	1,487
Total	$4,238	$6,723
Rehospitalization costs in first year (hospital costs only)	$ 802	$ 802
Long-term costs of treating low birthweight	$9,000	***$23,000***
Total net incremental costs	$14,040	$30,525

SOURCE Off Ice of Technology Assessment, 1988

Required Level of Effectiveness of Prenatal Care

If Medicaid were extended to all pregnant women in poverty, how effective would early prenatal care have to be for the estimated $4 million costs to be outweighed by savings from the prevention of low birthweight births? For health care costs to break even, early prenatal care among the 194,000 newly eligible women would have to prevent between 133 and 286 low birthweight births. If the low birthweight rate (i. e., the percentage of live births with birthweights of 2,500 grams or less) in the target population is about 10.2 percent,[20] the number of low birthweight births would have to decline by between 0.7 and 1.4 percent; the low birthweight rate in the target population would have to decline by between 0.07 and 0.20 percentage points to a rate of between 10 and 10.13 percent.

The reduction in the low birthweight rate would be concentrated in the subset of the target population whose use of prenatal care changed as a result of expanded benefits. Overall, 18.5 percent of the newly eligible women, or 35,890 women, are assumed to switch from later or no prenatal care to first-trimester care as a result of the expansion of Medicaid eligibility. If these women began with a low birthweight rate of 10.2 percent, then the low birthweight rate among them would have to decline by between 0.4 and 0.8 percentage points to a rate of between 9.4 and 9.8 percent.

Given the available information on the effectiveness of prenatal care, is it reasonable to expect reductions of this magnitude in the low birthweight rate? The evidence on the impact of earlier or more prenatal care on birthweight suggests that it is. The quantitative results of four studies with relatively good control over self-selection provide some perspective on what can be expected from programs that increase access to early prenatal care for poor women (149,311,600,659).

In a national study of live births in the United States in 1974, Eisner and colleagues found that after controlling for maternal age, marital status, maternal education, prior pregnancy interval, birth order, and prior pregnancy losses, women who received no prenatal care were between two and five times more likely to deliver a low birthweight baby, depending on the mother's race and the number of prior pregnancies, than were women who had received some prenatal care prior to delivery (149). Taking the most conservative estimate, these results imply that receipt of some prenatal care reduces the probability of low birthweight by 50 percent. This difference is many times greater than the required difference in OTA's analysis, but the comparison was between some care and no care, not between first-trimester care and later care. Getting some prenatal care may be more important to birthweight than getting early care.

In a 1981-82 study of births to mothers who were Medicaid recipients in Missouri, the ade-

[20] National data on the low birthweight rate among poor women are unavailable, but the low birthweight rate among women with less than 12 years completed years of schooling is 10.2 percent (709).

quacy of prenatal care (measured by an index based on trimester in which care began and number of visits adjusted for gestational age at birth) was found to be related to the low birthweight rate (659). In 1981, women receiving adequate prenatal care had a low birthweight rate of 10.6 percent as compared to 12.6 percent for women whose prenatal care was judged to be inadequate. (Similar differences were found in 1982.) Thus, moving from the inadequate to the adequate care category implied a reduction of 16 percent in the probability of a low birthweight birth. This percentage reduction is at least double the percentage reduction in the low birthweight rate among new users of early prenatal care (4 to 8 percent) that is required for net savings to accrue to the health care system. Apart from the fact that all births were to Medicaid recipients, however, this study had no controls for self-selection biases.

Joyce analyzed the low birthweight rate in U.S. counties from 1976 to 1978, controlling for the rate of use of family planning by teenagers, the abortion rate, the availability of neonatal intensive care units, resident's smoking rates, the rate of births to teenagers, the birth rate of older and high-risk women, and the population density of the county (311). For whites, every l-percent increase in the proportion of women receiving first-trimester care decreased the low birthweight rate by 0.029 percentage points. An increase of 18.5 percent in the percentage of women getting first-trimester care (as predicted in OTA's analysis) would correspond to a decrease of 0.5 percentage points in the low birthweight rate. This is more than twice the percentage point decrease required for health costs to break even in OTA's analysis (i. e., between 0.07 and 0.20 percentage points). Although Joyce's study is a county-level analysis, which can mask relationships occurring at the individual level, its findings strongly support the conclusion that the Medicaid expansion of prenatal care would be cost-saving to the U.S. health care system if adopted nationally.

In a study of low-income women who gave birth in a Cleveland hospital, a group of women who were eligible for a Maternity and Infant Care project because of their county of residence was compared with a group who resided in a county with similar socioeconomic and demographic characteristics but whose residents were not eligible for the program (600). Almost 48 percent of the program participants registered for care in the first trimester, as compared to 35 percent of women in the comparison group. The low birthweight rate was 11.7 in the program participants and 14. o in the comparison group. Thus, a difference of 13 percentage points in first-trimester use was associated with a difference of more than 3 percentage points in the low birthweight rate. The decline observed in this study is more than three times the percentage point decline required among new users in OTA's analysis (i.e., between 0.4 and 0.8 percentage points). Of course, some part of the differences may have been due to either more intensive services offered to the program women once they did register or systematic differences in the patient populations (e.g., some pregnant women residing in the county without the program may have been motivated to seek care at a hospital offering good services). The magnitude of the effect, however, seems to leave enough leeway to account for such potential biases.

In summary, the evidence from four studies that relate early receipt of prenatal care to birthweight strongly suggests that the effect size that might be reasonably expected from increasing the use of early prenatal care is at least as great as that required to justify early care on the basis of net savings to the health care system. That early prenatal care will also prevent some infant deaths (though the number cannot be predicted with any certainty) further enhances its cost-effectiveness.

ACCESS TO PRENATAL CARE: THE ROLE OF THIRD-PARTY PAYMENT AND ALTERNATIVE FUNDING SOURCES

The ability to pay for health care services is an important determinant of who receives care (653). Two major insurance options are available to pay for maternity care. Medicaid is the major public

financing program for pregnant women who are poor. Private insurance also provides maternity care coverage for women at all income levels. Two major financing alternatives to public and private insurance coverage for maternity care are the Maternal and Child Health (MCH) services block grant program and community health centers (CHCs). Available information regarding eligibility, benefits, and reimbursement under each source of funding is summarized below. A broader discussion of these funding sources, particularly as they pertain directly to children, is presented in chapter 3,

Medicaid

Eligibility

Medicaid eligibility takes one of two major forms. Historically, automatic categorical eligibility for poor women has been directly tied to eligibility for cash assistance through the AFDC program. In addition, States have the option to cover a wide range of groups through medically needy provisions. Medically needy programs include ". . . people who are not recipients of cash assistance, but who fit into one of the categories of people covered by the cash assistance programs and whose income and assets fall within the medically needy standards or who spend-down, because of their medical bills, to the medically needy standards" ***(674).***

Requirements and options for Medicaid eligibility have gone through a number of important changes during the 1980s. Under the Omnibus Budget Reconciliation Act of 1981 (OBRA-81) (Public Law 97-35), the changes resulted in the loss of Medicaid coverage and eligibility for substantial numbers of poor people. Between 1975 and 1984, the percentage of the poor covered by Medicaid dropped from 63 to 46 percent (544). In 1984 and again in 1986 and 1987, however, Congress enacted legislation that reversed some of the Medicaid eligibility restrictions under OBRA-81 (104,544). Medicaid coverage is currently mandated for all pregnant women with family incomes and resources below State AFDC financial eligibility requirements. OBRA-87 (Public Law 100-203) allows States the option of providing maternity care benefits to all pregnant women whose family incomes are at or below 185 percent of the Federal poverty level.

Anecdotal data suggest that even when women are eligible, the Medicaid enrollment process itself can be a formidable barrier to the receipt of timely care. States have 45 days to process an application for Medicaid, but additional delays can be encountered when applications are incomplete or when other impediments arise. A General Accounting Office survey of poor women in **32** communities who gave birth found that about 6 percent of women who attempted to enroll for Medicaid experienced long delays in receiving notification of eligibility. The median time between application and a determination of eligibility for these women was 8 weeks (653). Furthermore, many health care providers have been reluctant to offer care to women in anticipation of their eligibility for Medicaid, because providers have feared retroactive denial of eligibility and nonpayment for the services rendered ***(185).*** Under OBRA-86, a "qualified provider" can provide services to women presumed to be eligible and be guaranteed of Medicaid reimbursement even if eligibility is ultimately denied. "Qualified" providers include health departments, hospitals, and clinics. The "presumptive eligibility" clause is not applicable to private physicians' practices. Thus, the presumptive eligibility clause of OBRA-86 appears to channel pregnant women who are probably eligible for Medicaid into sources of prenatal care other than private practices,

Some local providers have tried to institute policies that help overcome barriers to the timely receipt of prenatal care. One study found that when hospitals provide resources to help uninsured patients enroll in Medicaid and verification procedures are relaxed, poor women initiate care earlier in pregnancy (309). Barriers in the Medicaid enrollment process may encourage women to seek care through non-Medicaid programs and may in part explain why poor women who should be eligible for Medicaid sometimes fail to enroll and remain uninsured.

Benefits

Under Medicaid, some services are mandated, while others are optional. Also, States may place limits on the extent of both required and optional services which can be billed to Medicaid. Required services include inpatient and outpatient hospi-

tal care, physician care, laboratory tests, X-rays, family planning, and nurse midwife services[21] among others. Clinic services, prescription drugs, diagnostic and screening services, and dental care are optional services.

Some observers contend that these optional services are important features of comprehensive prenatal care and, in many States, are unavailable (209). In 1985, for example, five States did not cover services provided by clinics, a major source of health care for poor women. Ten States set limits on the number of outpatient hospital visits[22] and physician visits that could be reimbursed by Medicaid; these limits were less than the 12 to 13 prenatal care visits recommended by the American College of Obstetricians and Gynecologists or would have precluded frequent visits during the third trimester (209). Pregnant adolescents may be able to avoid some of these restrictions on benefits by virtue of their eligibility for extended care through the Early and Periodic Screening, Diagnosis, and Treatment (EPSDT) program within Medicaid. It is unclear, however, how many States utilize EPSDT to provide more comprehensive services to pregnant teens (209).

The Consolidated Omnibus Budget Reconciliation Act of 1985 (COBRA) (Public Law 99-272) expanded service-related benefits for pregnant women in three ways (104). First, it mandated an additional 60 days postpartum coverage for all women whose Medicaid eligibility was based solely on their pregnancy status. Second, COBRA permitted States to provide enriched services to pregnant women without extending such benefits to other Medicaid eligibles. Finally, it permitted case-management services (e. g., outreach, referral, and service coordination) to be provided to recipients.

Physician Participation in Medicaid

Physicians' refusal to accept Medicaid reimbursement for maternity care in private practice settings has been widely considered to be a major barrier to poor women's obtaining prenatal care. Only one recent study directly assessed this issue. In a 1983 national probability sample survey of private physicians likely to provide reproductive health services, the Alan Guttmacher Institute found that among physicians who actually provide obstetric care, 56 percent reported that they accepted Medicaid reimbursement (473).[23]

Reasons given for low Medicaid participation rates among physicians include low reimbursement rates and onerous administrative procedures. Data on physician participation presented in appendix E clearly indicate that fees for obstetrical care paid by Medicaid are losing ground to private fees.

Furthermore, payment by Medicaid tends to be delayed because of administrative procedures. Most States reimburse for Medicaid-financed maternity care through a global fee covering prenatal, delivery, and postpartum care. Physicians generally cannot bill Medicaid for such care until after the delivery, a requirement that in some cases delays reimbursement for a year or more. Additionally, in some States, doctors must receive prior authorization for the delivery of certain types of services, thereby increasing the paperwork involved in serving Medicaid recipients (431).

Private Insurance

Private health insurance in the United States is largely provided through employers. For women who work, such insurance is often available directly; for other women, it maybe available indirectly via family coverage purchased through the workplace by a parent or spouse. In 1984, about 67 percent of women aged 15 to 44 were covered by a group health insurance plan (209). Group coverage is strongly related to income level. In 1984, over 80 percent of women with family incomes at or above 250 percent of the Federal poverty level were covered by a group plan, as compared to only 17 percent of women with family incomes at or below the Federal poverty level.

[21] A State's Medicaid plan must provide coverage of nurse midwife services for the categorically needy to the extent that nurse midwives are authorized to practice under State law or regulation (42 CFR 440.210).

[22] In a survey of 30 States, Rosenbaum (542) found that 24 States also placed some limit on covered inpatient hospital days.

[23] Other data are also available, but they do not specifically address physician acceptance of Medicaid reimbursement for maternity care. See app. E for a review of the evidence on physician participation in Medicaid.

In 1978, Congress passed the Pregnancy Discrimination Act (Public Law 95-555), changing requirements for maternity care benefits in group health insurance plans. This law required employers who offered health insurance to provide maternity care benefits in the same manner. Firms with fewer than 15 employees and individual insurance policies were exempted from the law's requirements (209).

Maternity care benefits vary from policy to policy, although detailed information on these benefits is sketchy (209,543). Most insurance plans provide some coverage for laboratory tests and drugs, but information regarding coverage for special diagnostic procedures such as ultrasound or amniocentesis is generally unavailable. Data on the number of prenatal care visits that insurance plans will reimburse are also unavailable. Hospital room and board charges usually make up the bulk of maternity care expenses. In 1980, almost all coverage for such charges was limited by a deductible or coinsurance requirements or had an individual benefit maximum (105).

Alternatives to Public and Private Insurance

Some poor women are able to obtain prenatal care without the benefit of Medicaid or private insurance coverage. Typically, they must rely on health care providers who offer reduced fee schedules or who provide a certain amount of uncompensated care. Services for many poor women are provided by CHCs and are also often financed through the MCH block grant program.

Maternal and Child Health Services Block Grant Program

The MCH block grant program represents the major Federal maternity care funding alternative to public and private insurance. The MCH block grant consolidated seven health programs for women and children: maternal and child health, services for disabled children receiving supplemental security income, prevention of lead poisoning, genetic diseases, sudden infant death syndrome, hemophilia treatment, and prevention of adolescent pregnancy (209). Federal MCH block grants are awarded to the States, which in turn provide grants directly to public and private providers of maternal and child health care or crippled children's services (209,541).

States have wide latitude in establishing who is eligible for services and what those services can be. Expenditures for specific services (e.g., prenatal care v. well-child care) under the MCH block grant program are nearly impossible to identify, largely because the Federal Government does not require the collection or reporting of pertinent data. This problem is exacerbated by the fact that there are no requirements regarding minimum services and eligibility, As a consequence, very little is known about who receives what types of services under the MCH block grant (209).

Community Health Centers

The CHC program is one of the largest categorical grant programs, providing maternal and child health care, as well as other services, to residents of medically underserved areas ***(224).*** In fiscal year 1985, CHCs received $383 million in Federal funding (772) (see ch. 2). Rosenbaum (543) reports that nearly half of all CHC users are completely without health insurance. In addition, over one-quarter (28.6 percent) of CHC users are in their childbearing years.

CHCs offer a wide range of services (224). Certain services, called "primary health services, " are provided by all CHCs. These include preventive health services (e.g., perinatal care, family planning), diagnostic care, emergency care, and transportation. Other services, called "supplemental health services, " are provided at the grantee's option. Such services include hospital care, health education, and dental and vision care, among others. Charges for care received at CHCs are usually assessed on a sliding fee scale, with families living below the Federal poverty level eligible for free care.

Strengths and Limitations of Alternative Mechanisms for Financing Maternity Care

A critical question for the development of policy regarding prenatal care is which approach is the most effective in increasing access to prenatal care services:

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1. an insurance program such as Medicaid?
2. Federal grants to States, which in turn distribute funds to local providers, such as the MCH block grant? or
3. direct grants to health care providers such as the current CHC program model?

Which approach encourages the most effective provision of maternity care? OTA was unable to locate any studies that addressed these important questions.

CONCLUSIONS

Taken together, the weight of the evidence on both routine prenatal care and augmented prenatal care suggests that birth outcomes can be improved when women receive earlier or more comprehensive prenatal care. Although available studies of the effectiveness of prenatal care generally support the contention that prenatal care does improve birth outcomes, they do not provide definitive quantitative estimates of these effects.

OTA examined how costs to the U.S. health care system (not just to Medicaid) and birth outcomes would be affected by a policy of making pregnant women in poverty universally eligible for Medicaid. Such a policy could be implemented if every State were to expand eligibility to all pregnant women with incomes up to the poverty line, or if Congress were to require, rather than permit, States to provide such coverage. OTA calculated what percentage reduction in the low birthweight rate would be necessary to balance the extra prenatal care costs with equal savings in short- and long-term health care costs. This estimate was then compared to available evidence on the effectiveness of prenatal care to determine whether the estimate lies within reasonable bounds.

Overall, OTA found, offering Medicaid eligibility to all pregnant women in poverty would cause an additional 18.5 percent of women in this category to initiate prenatal care in the first trimester of pregnancy. Nationally, the extra prenatal care would cost about $4 million per year. Expected short- and long-term savings in health care costs associated with the prevention of each low birthweight birth are so great (between $14,000 and $30,000), however, that prenatal care would need to have only marginal effects on birthweight to be justified on cost grounds alone. The required level of effectiveness for the breakeven point is well below the order of magnitude of the effects found in several reasonably well-designed studies of prenatal care. In addition, by reducing the incidence of low birthweight, better prenatal care for poor women would also save some (though relatively few) infant lives, and prenatal care may have effects on infant mortality independent of its effects on birthweight.