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The Savings in Medicaid Costs for Newborns and Their Mothers from Prenatal Participation in the WIC Program

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THE EFFECT OF PRENATAL WIC PARTICIPATION ON MEDICAID COSTS

Prenatal WIC participation was associated with substantial savings in Medicaid costs for newborns and their mothers during the first 60 days after birth. When newborn and maternal Medicaid costs were able to be separated, the estimated savings in newborn Medicaid costs associated with prenatal WIC participation were even greater than the estimated savings in combined newborn and maternal Medicaid costs.

- Average Medicaid costs from birth to 60 days after birth ranged from $2,433 in South Carolina (hospital costs only) to $3,822 in Minnesota. Average Medicaid costs for newborns only from birth to 60 days after birth were available only for North Carolina and Texas and were $1,733 and $1,867, respectively.

- Estimated reductions in Medicaid costs for newborns and their mothers during the first 60 days after birth associated with prenatal participation in the WIC program ranged from $277 in Minnesota to $598 in North Carolina, with intermediate values of $347, $493, and $565 in Florida, Texas, and South Carolina, respectively.

- Estimated savings in newborn Medicaid costs from birth through 60 days associated with prenatal WIC participation were $744 in North Carolina and $573 in Texas.

Estimated savings in Medicaid costs were combined with data on the costs of the WIC program to determine benefit-cost estimates for the prenatal component of the WIC program. All benefit-cost estimates were greater than one, indicating that the benefits of prenatal WIC participation (estimated Medicaid savings) exceeded the costs of providing prenatal WIC benefits. For newborns and mothers, these estimates ranged from 1.77 in Florida to 3.13 in North Carolina, with values of 1.83 for Minnesota and 2.44 for both South Carolina and Texas. For newborns only, the benefit-cost estimates were 3.90 in North Carolina and 2.84 in Texas. Thus, for every dollar spent on the prenatal WIC program, the associated savings in Medicaid costs during the first 60 days after birth ranged from $1.77 to $3.13 for newborns and mothers and from $2.84 to $3.90 for newborns only.

Two points must be considered when these findings are interpreted. First, the estimated savings in Medicaid costs from birth to 60 days after birth associated with prenatal WIC participation are independent of the effects of prenatal care on Medicaid costs. The analytical results also show that considerable Medicaid cost savings during the 60-day period after birth are associated with receiving adequate or intermediate levels of prenatal care.

the household incomes of the Medicaid mothers and newborns considered in this study were very low, and considerably lower than the WIC income eligibility limit of 185 percent of poverty. Since 1987, Medicaid has increased the income eligibility standards for pregnant women and children. Currently, states are required to expand Medicaid coverage to pregnant women and children whose incomes are below 133 percent of poverty and have the option to provide coverage up to 185 percent of the federal poverty level.

THE CHARACTERISTICS OF WIC PARTICIPANTS AND NONPARTICIPANTS

The basic analytic approach to measuring the savings in Medicaid costs from prenatal participation in the WIC program was to compare the Medicaid costs of WIC participants with the Medicaid costs of a group of women who did not participate in the WIC program (nonparticipants). However, because WIC participants may differ from nonparticipants in terms of other factors that also influence Medicaid costs, it was necessary to identify and adjust for these differences in order to obtain accurate estimates of the effects of prenatal WIC participants. Thus, an important component of the analysis was a descriptive analysis of the demographic and prenatal care characteristics of Medicaid mothers who are WIC participants and those who are nonparticipants. WIC participants are defined as women who redeemed any food instruments during the nine months prior to birth or, if no redemption data are available, who had a WIC certification date during the nine months prior to birth.

Differences in the adequacy of prenatal care for WIC participants and nonparticipants were large and consistent across the study states. In all five states, Medicaid mothers who did not participate in the WIC program were two to three times as likely to have received inadequate prenatal care as WIC participants, where inadequate prenatal care is defined as 4 or fewer prenatal care visits. Overall, 9.6 percent of WIC participants received inadequate levels of prenatal care, in contrast to 22.4 percent of nonparticipants. WIC participants in all five states also had an average of one to two more prenatal visits. The average number of prenatal care visits ranged from 8.9 to 11.2 for WIC participants and from 7.1 to 9.2 for nonparticipants. These findings have important implications for the analysis of Medicaid cost savings, since it is important that the effects of prenatal WIC participation be isolated from the effects of prenatal care on Medicaid costs.

In contrast to the striking differences in the adequacy of prenatal care, the differences in the demographic characteristics of WIC participants and nonparticipants in any given state were generally quite small.

births in Texas to almost three-quarters of the Medicaid births in South Carolina.

The five study states exhibited some striking contrasts in birth outcomes and perinatal risk factors. Minnesota had a lower proportion of low-income women than the other study states and had birth outcomes that were more favorable than those of the other study states. Both its infant mortality rate and percentage of low-birthweight infants (birthweight of less than 2,500 grams, or 5.5 pounds) were the lowest of the five states and were lower than the rate for the nation as a whole. In contrast, all of the three Southeastern states--Florida, North Carolina, and South Carolina--had infant mortality rates that were higher than the national average. Texas is an extremely large state, accounting for roughly 8 percent of all U.S. births. In 1987, its infant mortality rate was below the U.S. average, although a relatively high proportion of women received inadequate levels of prenatal care.

PROGRAM BACKGROUND

Authorized by Congress in 1972, the WIC program provides nutritional risk assessments, food supplementation, nutrition education, and health and social service referrals to low-income pregnant and postpartum women and their infants, and children up to age five. The program, which is federally funded and administered by state and local agencies, has become one of the largest public health programs for low-income pregnant women and children. Nationwide, the WIC program has grown from a $750 million program that served 2 million women and children in 1980 to an estimated $2.1 billion program that serves 4.5 million women and children in 1990. During fiscal year 1987, the WIC program in the five study states ranged from an approximately $26 million program that served an average of 56,000 persons per month in Minnesota to a $112 million program that served 226,000 persons per month in Texas.

Medicaid is a joint federal and state program that reimburses the covered medical-care costs of low-income persons. Authorized under Title XIX of the Social Security Act, Medicaid has become the nation's primary medical-reimbursement program for low-income individuals. For many years, the income eligibility for Medicaid was linked to the AFDC income eligibility standards, which were low enough that many women below the poverty level were not poor enough to qualify for Medicaid. In 1987, the poverty income threshold was $9,056 for a family of three, and, for the five study states, the Medicaid income eligibility standards for pregnant women and children ranged from 33 percent of the poverty level in Texas to 88 percent of the poverty level in Minnesota. In Florida, North Carolina, and South Carolina, income eligibility levels were between 40 and 50 percent of the poverty level for most of the study period. Thus,

THE SAVINGS IN MEDICAID COSTS FOR NEWBORNS AND THEIR MOTHERS FROM PRENATAL PARTICIPATION IN THE WIC PROGRAM

EXECUTIVE SUMMARY

This study is mandated by the Commodity Distribution Reform Act and WIC Amendments of 1987 (Public Law 100-237) and the Joint Resolution Continuing Appropriation for Fiscal Year 1988 (Public Law 100-202). Its primary objective is to determine the savings in Medicaid costs for newborns and their mothers during the first 60 days after birth from participating in the Special Supplemental Food Program for Women, Infants, and Children (WIC) during pregnancy. The prenatal component of the WIC program provides food supplementation, nutrition education, and health-care and social services referrals to low-income pregnant women, the primary goal of which is to improve their nutritional status. To the extent that improved nutritional status leads to more favorable birth outcomes, then lower Medicaid expenditures and indigent care costs after birth may offset the costs of providing prenatal WIC benefits.

A secondary objective of this study is to examine the effects of prenatal participation in the WIC program on two important birth outcomes--birthweight and gestational age. This analysis complements the analysis of Medicaid costs, in that the savings in Medicaid costs can be interpreted within the context of the effects of WIC participation on birth outcomes.

Specifically, the analysis conducted for this study addressed the following questions:

- What are the savings in Medicaid costs for newborns and their mothers during the first 60 days after birth from participating in the WIC program during pregnancy?
- Are the savings in Medicaid costs that are due to prenatal WIC participation greater or less than the costs of providing WIC benefits to pregnant women?
- Does prenatal WIC participation affect such birth outcomes as birthweight and gestational age?

DESCRIPTION OF THE STUDY STATES

The study entailed analyses of the relationship between Medicaid costs and prenatal WIC participation in each of five states--Florida, Minnesota, North Carolina, South Carolina, and Texas. The study period included all Medicaid births in 1987 for Florida, Minnesota, North Carolina, and South Carolina and all Medicaid births from January through June 1988 in Texas. These five states accounted for nearly 105,000 Medicaid births. The proportion of these births to WIC participants varied considerably across the study states, ranging from nearly one-half of the Medicaid

- For newborns and mothers, the estimated savings in Medicaid costs during the first 60 days after birth associated with receiving adequate or intermediate levels of prenatal care were $267 in Florida, $362 in Texas, $623 in South Carolina (hospital costs only), $415 in North Carolina, and $1,005 in Minnesota.

- For newborns only, the estimated reductions in Medicaid costs during the 60-day period after birth associated with receiving adequate or intermediate levels of prenatal care were $610 in Texas and $593 in North Carolina.

The second important point is that the estimated savings in Medicaid costs associated with prenatal WIC participation are not independent of any unmeasured characteristics that also may affect pregnancy outcomes and maternal and newborn Medicaid costs. WIC participants are a self-selected group of women who may choose to participate in the WIC program for underlying reasons that might also influence pregnancy outcomes and Medicaid costs even in the absence of the WIC program. For example, some pregnant women may not participate in the WIC program because they lack access to public programs that provide health care and other services, which may independently affect pregnancy outcomes. Thus, the estimated savings in Medicaid costs related to prenatal WIC participation may overestimate the true savings since, relative to nonparticipants, WIC participants would have lower Medicaid costs in the absence of the WIC program. The problem introduced by self-selection is rendered less severe by the fact that (1) the adequacy of prenatal care is also likely to be related to any such underlying differences between WIC participants and nonparticipants, and (2) the analysis was able to adjust the estimated savings in Medicaid costs associated with prenatal WIC participation for the adequacy of prenatal care. However, the potential implications of the self-selection issue should be kept in mind when the study results are interpreted and generalized.

THE EFFECT OF PRENATAL WIC PARTICIPATION ON BIRTH OUTCOMES

In all five study states, prenatal WIC participation by Medicaid recipients was associated with increased birthweight, and the estimated increase in birthweight was greatest for births occurring before 37 weeks gestation.

- The average increase in birthweight related to prenatal WIC participation by Medicaid recipients ranged from 51 grams in Minnesota to 73 and 77 grams in Florida and Texas, respectively, to 113 and 117 grams in South Carolina and North Carolina, respectively.

- For Medicaid births occurring before 37 weeks gestation, the average increase in birthweight associated with prenatal WIC participation ranged from 138 grams in Minnesota to 259 grams--approximately half a pound--in South Carolina.

- Prenatal WIC participation by Medicaid recipients was also associated with a lower incidence of preterm births and a longer gestational age.

GENERALIZATION OF THE STUDY FINDINGS

The results of the study indicate that prenatal participation in the WIC program improves birth outcomes and generates savings in Medicaid costs. Two important questions concerning the study results are:

1. What inferences can be drawn from these state-specific results about the nation as a whole?

2. How stable are these conclusions over time?

The following socioeconomic differences among Medicaid-eligible pregnant women and differences among the state Medicaid programs are particularly important for addressing these two questions:

- At the time of the study, Medicaid income eligibility ceilings ranged from 33 percent of the poverty level in Texas to 88 percent in Minnesota; the other three states had income eligibility ceilings between 40 percent and 50 percent of the poverty level. In 1987, the federal poverty income threshold was $9,056 for a family of three. If prenatal WIC participation is more beneficial for lower-income women, the variation across states in the Medicaid eligibility ceilings would result in larger effects of prenatal WIC participation in states with lower Medicaid eligibility ceilings and smaller effects in states with higher ceilings.

- The Medicaid income eligibility standards have increased considerably since 1987. If prenatal WIC participation is more beneficial for lower-income women, then the benefits of prenatal WIC participation observed in 1987 may be greater than what would be observed under the current Medicaid income eligibility standards for pregnant women, which range from 133 to 185 percent of the federal poverty level.

- In 1987, both Florida and Texas imposed inpatient hospital service limits that may have restricted the amounts that Medicaid reimbursed

for high-cost newborns. The other three states did not impose inpatient hospital service limits. These limitations on Medicaid reimbursements could have the effect of reducing the savings in Medicaid costs in Florida and Texas relative to the other study states and would reduce the savings in Medicaid costs in other states with relevant reimbursement limitations. Since 1987, however, those restrictions on Medicaid reimbursements in Florida and Texas have been relaxed considerably, which could have the effect of increasing the potential for savings in Medicaid costs in these two states.

- Among the five study states, only South Carolina did not have a medically needy spend-down program at the time of the study. Spend-down eligibility is a vehicle by which high-cost newborns can become eligible for Medicaid due to their medical expenses. The absence of the program could have the effect of reducing the apparent benefits of WIC participation in South Carolina and in other states without medically needy programs if the spend-down eligibility category included a greater proportion of nonparticipants in the WIC program than did other Medicaid eligibility categories.

The fact that the benefits of WIC program participation were so clearly demonstrated in all the study states, despite their population and program differences, suggests that a nationwide study of all 1987 Medicaid births would show similar outcomes for WIC program participants and benefit-cost ratios greater than one in the large majority of states.

Recent expansions and program enhancements in the Medicaid and the WIC programs, as well as the growing problem of substance abuse among pregnant women, may also affect the long-term stability of the study results. Higher Medicaid income-eligibility ceilings for pregnant women, in conjunction with increased coordination between the Medicaid and the WIC programs, mean that a higher-income group of women are likely to participate in the WIC program. At the same time, aggressive outreach and improved eligibility procedures may bring a higher-risk group of pregnant women into both the Medicaid and the WIC programs. The net effects of these enrollment changes on estimates of WIC benefits is uncertain.

I. INTRODUCTION

The Commodity Distribution Reform Act and WIC Amendments of 1987 (Public Law 100-237) and the Joint Resolution Continuing Appropriation for Fiscal Year 1988 (Public Law 100-202) mandated a study to examine the relationship between prenatal participation in the Special Supplemental Food Program for Women, Infants, and Children (WIC) and Medicaid costs for mothers and newborns from birth to 60 days after birth. This report presents the results of the study and consists of two volumes. This first volume summarizes and discusses the basic findings of the study and describes the WIC and Medicaid programs. The second volume provides a more in-depth discussion of the methodological approach underlying the study and the results of the analysis.

A. RATIONALE FOR THE STUDY

Low birthweight and infant mortality are major public health concerns in the United States. The high social and economic costs associated with low birthweight are now widely recognized, and public policy has endeavored to prevent low birthweight by enhancing access to prenatal care, particularly among low-income women. The high costs of caring for infants with low birthweight impose a large financial burden on the Medicaid program, the nation's primary program providing reimbursement for health care services to low-income women and their children. During 1984-85, approximately 17 percent of total U.S. births were financed by Medicaid, and up to 41 percent of Medicaid expenditures for delivery were for high-cost deliveries (Alan Guttmacher Institute, 1987; Howell and Brown, 1989). In recent years, the Federal government has expanded the Medicaid program specifically to improve access to prenatal and neonatal care for poor women and their children.

At the same time, evidence that good prenatal nutrition improves birth outcomes has prompted increased expenditures under the WIC program, which was authorized by Congress in 1972 to provide nutritional risk assessments, food assistance, nutrition education, and health and social service referrals to low-income pregnant and postpartum women and their infants, and children up to age five. The major goal of the prenatal nutrition supplementation and education provided under the WIC program is to improve the nutritional status of low-income pregnant women. The program, which is federally funded and administered by state and local agencies, has become a major component of the maternal and child health services delivered at the state and local levels. Nationwide, the WIC program has grown from a $750 million program that served 2

million women and children in 1980 to a $2.1 billion program that serves an estimated 4.5 million women and children in 1990.

Since both the WIC and Medicaid programs serve low-income pregnant women, an important issue is the extent to which prenatal participation in the WIC program affects the subsequent health-care costs of Medicaid-eligible women and their newborns. In particular, if WIC participation during pregnancy improves pregnancy outcomes, then lower Medicaid expenditures and state indigent care expenditures in the neonatal period and later in life may offset the costs of the WIC program. To examine this issue further, Congress directed the Secretary of Agriculture in 1987 to undertake a study to assess the savings in Medicaid and state indigent care costs for women and their newborns during the first 60 days after birth that are due to the mother's prenatal participation in the WIC program. This report presents the findings of this study.

B. THE OBJECTIVES OF THIS STUDY

As mandated, the primary objective of this study is to determine the extent to which the participation of pregnant women in the WIC program affects Medicaid and indigent care costs from birth to 60 days after birth. The study entailed analyses of the relationship between Medicaid costs and WIC participation in each of five states--Florida, Minnesota, North Carolina, South Carolina, and Texas.[1] A secondary objective of this study is to examine the effects of prenatal WIC participation on birth outcomes, including birthweight and gestational age. This analysis of birth outcomes is important for two reasons. First, savings in Medicaid costs can be interpreted within the context of the effects of WIC participation on birth outcomes. Second, WIC participation may have effects on birth outcomes that may not adequately be reflected by the estimated savings in Medicaid costs. That is, to the extent that WIC participation improves birth outcomes by drawing individuals into the health care system, this increased demand for health care may at least partially offset any savings in Medicaid costs due to better birth outcomes.

[1]As discussed in Chapter II of this volume, examining state indigent care costs was not feasible in this study.

Specifically, the analysis addressed the following questions:

- What are the savings in Medicaid costs for mothers and their newborns from birth to 60 days after birth due to the mothers' participation in the WIC program during their prenatal period?

- Are the savings in Medicaid costs that are due to prenatal WIC participation greater or less than the costs incurred by the WIC program to provide its services, including the costs of nutrition supplementation, administration, and nutrition education?

- Does prenatal WIC participation by Medicaid recipients affect such birth outcomes as birthweight and gestational age?

C. BASIC STUDY DESIGN

The analysis of the effects of prenatal WIC participation on Medicaid costs from birth to 60 days after birth included three key components:

1. Combining information on Medicaid costs, WIC participation and costs, and birth outcomes for each of the study states

2. Assessing the savings in Medicaid costs by comparing Medicaid costs for WIC participants with the Medicaid costs for nonparticipants based on statistical analysis to adjust for differences in costs attributable to other factors

3. Interpreting the study findings and their implications for the states not included in the study and for recent changes in the WIC and Medicaid programs and target populations

The first component pertains to the data used in the analysis. In each of the five study states, the database for the analysis was constructed from three separate state data files: (1) Medicaid files, which provided Medicaid cost and eligibility data on newborns and their mothers; (2) Vital Records files (birth, infant death, and fetal death files), which provided data on maternal characteristics, birthweight and other newborn characteristics, prenatal care, and infant and fetal deaths; and (3) WIC program files, from which the Medicaid mothers were identified as either

WIC participants or nonparticipants and which provided WIC cost data on the participants. These three data files were linked to create a database with Medicaid birth records in a given time period that included data on Medicaid costs, WIC participation status and costs, birthweight and other pregnancy outcomes, and maternal characteristics, such as age, race, birth parity, education, marital status, prenatal care, and previous obstetrical history. The time period was 1987 for Florida, Minnesota, North Carolina, and South Carolina and the first six months of 1988 for Texas. The WIC/Medicaid data are described in Chapter III of this volume and in more detail in the forthcoming Volume 2 of this report.

The second analytic component entailed developing an accurate measure of the Medicaid costs that WIC participants would have incurred had they not participated in WIC. This analytical component was not straightforward, because, in addition to WIC participation, WIC participants and nonparticipants may differ in terms of other characteristics that affect perinatal outcomes and Medicaid costs. These factors include demographic and prenatal care characteristics, all of which vary across individuals and across the study states. Chapter IV of this volume contains a brief summary of the methodological approach to this study and Volume 2 will describe the methodological approach in greater depth.

The third analytic component entailed using the results of the analysis to draw inferences about the WIC and Medicaid programs. The analysis yielded findings on the cost-effectiveness of prenatal WIC participation in four states during 1987 and during the first six months of 1988 for Texas.[2] These findings differ among the study states, because their demographic compositions and institutional structures differ and because they face different problems in ensuring that low-income pregnant women and children have access to care. In addition, the WIC and Medicaid programs have changed since the study period. It is important that these factors be considered when the findings are interpreted, in order to assess their implications for the WIC and Medicaid programs.

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[2]The five states were selected on the basis of an extensive feasibility study that encompassed site visits to seven possible participant states and a thorough review of their programs and data systems. Based on this review, five of the seven states in the feasibility study were selected to participate.

D. ORGANIZATION OF THIS REPORT

This volume includes five chapters and two appendices. Chapter II provides background information on the states included in the study and on the WIC and Medicaid programs in those states. Chapter III describes the data used in the analysis and presents descriptive data on the Medicaid births in each of the study states. The main analytical findings are presented in Chapter IV, and Chapter V discusses the implications of the study findings for the national WIC and Medicaid programs. Appendixes A and B contain tables with detailed analytical results.

II. DESCRIPTION OF THE STUDY STATES AND THE WIC AND MEDICAID PROGRAMS

Background information on the study states and on the WIC and Medicaid programs is important for interpreting and generalizing the findings of the study, which are presented in the subsequent chapters of this report. Section A of this chapter describes the perinatal and sociodemographic characteristics of the five study states, and Section B provides background information on the WIC and Medicaid programs.

A. DESCRIPTION OF THE STUDY STATES

Five states were selected for this study--Florida, Minnesota, North Carolina, South Carolina, and Texas. Several factors were considered in the final selection of the study states. They include:

- **The geographical distribution of the study states.** The study states were selected in part to ensure a representative geographic distribution. The North Central, Southeastern, and Southwestern regions of the country are represented by the five states selected, although three of the five states are from the Southeast.

- **Large urban areas.** Three of the five states selected (Florida, Minnesota, and Texas) have large urban areas, which is useful for drawing conclusions about the effectiveness of the WIC program in other states with large urban areas.

- **Perinatal outcomes.** It was desirable that the study states exhibit variation in birth outcomes and perinatal risk factors to facilitate determining whether the cost-effectiveness of the WIC program depends on the extent to which the target population exhibits adverse birth outcomes. The perinatal outcomes for the study states range from some less favorable outcomes for South Carolina to some very favorable outcomes for Minnesota.

- **Minority representation.** Given the ethnic diversity of the target population, it was desirable that the study states exhibit a broad representation of minorities. Four of the five states (the exception is Minnesota) have large minority populations, and both Florida and Texas have a large Hispanic population. In addition, Minnesota provides information on the effects of prenatal WIC participation in states with a predominantly white population.

- **WIC participation rate.** Variation in the penetration of the WIC program among eligible pregnant women is important for assessing the effects of prenatal WIC participation in states whose availability and accessibility of WIC services differ. For the five states in this study, the percentage of Medicaid births occurring to WIC participants ranged from a low of 47.8 percent in Texas to a high of 73.4 percent in South Carolina, with intermediate values of 57.6 percent, 68.8 percent, and 68.7 percent in Florida, Minnesota, and North Carolina, respectively.

Although only five states participated in the WIC/Medicaid study, the selected states accounted for 18 percent of all U.S. births in 1987. Overall, some striking contrasts in birth outcomes and perinatal risk factors exist among the five study states. As shown in Table II.1, Minnesota contains a lower proportion of low-income women and exhibits birth outcomes that are more favorable than those of the other study states. Both its infant mortality rate and percentage of low birthweight infants are the lowest of the five states and are lower than the rates for the nation as a whole. In contrast, all of the three Southeastern states--North Carolina, South Carolina, and Florida--have infant mortality rates greater than the national average, with South Carolina having the highest rate of the five study states. Texas is an extremely large state, accounting for roughly 8 percent of all U.S. births. Its infant mortality rate is below the U.S. average, although the percentage receiving late or no prenatal care is considerably higher than the national average and is the highest of the five study states.

Table II.1 presents information on three key perinatal risk factors: the poverty status of women of childbearing age, births to teenagers, and inadequate prenatal care. The following summarizes the differences in these risk factors among the study states:

- **The poverty status of women of childbearing age.** Minnesota has a considerably lower percentage of low-income women of childbearing age than do the other four states, and the contrast is even more marked for the proportion of women below 185 percent of the poverty level. At the other end of the spectrum, South Carolina has the highest percentage of low-income women of childbearing age. In comparison with national data, the proportion of low-income women of childbearing age in North Carolina in 1984-1986 is very

TABLE II.1

BIRTH OUTCOMES AND PERINATAL RISK FACTORS: U.S. AND STUDY STATES

	U.S.	Florida	Minnesota	North Carolina	South Carolina	Texas
Total Births, 1987	3,809,394	175,144	65,173	93,501	52,801	301,962
Infant Mortality Rate, 1987[a]	10.1	10.6	8.7	11.9	12.7	9.1
Percent Low Birthweight, 1987[b]	6.9	7.7	5.0	7.9	8.6	6.9
Percent of Women Ages 15-44 Below Poverty Thresholds, 1984-86						
< 100%	15.2	15.4	11.4	14.0	17.3	15.2
< 150%	24.3	26.8	19.4	24.2	29.4	25.5
< 185%	31.0	34.4	25.0	32.3	37.6	33.1
Percent of Births to Teenagers, 1986	12.6	13.8	7.3	15.9	16.6	15.2
Percent of Births to Women Receiving Late or No Prenatal Care, 1986	6.0	8.6	3.8	4.6	8.1	11.5

SOURCES: National Center for Health Statistics (1988 and 1989), Newacheck (1988), and Hughes et al. (1989).

[a]Number of infant deaths per 1,000 live births.

[b]Birthweight of less than 2,500 grams.

close to the 1986 national average, while the proportion for Minnesota is considerably below the national average, and the proportions for the other three states exceed the national average.

- **Births to teenagers.** In all four Southern states, the percentage of births to teenagers is high relative to the nation as a whole, while a very low percentage of births occurs to teenagers in Minnesota. The contrast between the percentage of births to teenagers in Minnesota and the four Southern states is striking.

- **Inadequate prenatal care.** In 1986, the percentage of births to women receiving late prenatal care (prenatal care during the third trimester only) or no prenatal care was high in Florida, South Carolina, and Texas relative to Minnesota and North Carolina and relative to the nation as a whole. In contrast, the percentage with late or no prenatal care was lower in both Minnesota and North Carolina than the U.S. average.

For the most part, these data on perinatal risk factors are consistent with the birth outcomes of the five study states. In particular, Minnesota has both very favorable birth outcomes and lower risk factors for adverse perinatal outcomes relative to the other four states, while South Carolina shows the highest levels of risk for two of the three perinatal risk factors and the highest rates of infant mortality and low birthweight.

The inclusion of Florida and Texas, both of which have a large Hispanic population, raises some very interesting issues. The observed relationship between prenatal care utilization and birthweight is weaker in states with high proportions of Hispanic and Native American births (Hughes et al., 1989). In general, Hispanic women have lower rates of prenatal care utilization than non-Hispanic women, but also appear to be at lower risk for having low-birthweight infants. It is possible that cultural factors influence their use of prenatal care and affect their birth outcomes. Thus, in analyses of the effects of prenatal WIC participation on Medicaid costs and birth outcomes, the effects of variations in race and ethnicity must be accounted for.[1]

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[1]Florida and Texas are the only two of the five study states for which data on Hispanic ethnicity are available. However, the number of Hispanic births in the other three states is very small.

B. PROGRAM BACKGROUND

The descriptions of the WIC and Medicaid programs in this section provide background information for the analytical findings presented in the following chapters. The discussion focuses primarily on the important features of program operations. A broader discussion of WIC, Medicaid, and other indigent care programs for low-income pregnant women and their newborns is contained in another report from this study, "Description of State Programs" (Bilheimer, 1990).

WIC Program

The WIC program was authorized by Congress in 1972 to provide nutritional screening, food assistance, nutrition education, and health care referrals to low-income pregnant women, breastfeeding women, postpartum women, infants, and children up to age five who are at nutritional risk. The major goal of the prenatal component of the WIC program is to improve the nutritional status of low-income pregnant women. In most states, the WIC program has become one of the largest and most important public health programs for low-income pregnant women and infants, but both the extent to which the WIC program is integrated with other maternal and child health services and the proportion of eligible women and infants who participate vary considerably across the states.

Program eligibility depends on both income level and evidence of nutritional risk. States have the option of setting income eligibility between 100 and 185 percent of the federal poverty level, provided that income eligibility is no lower than that for free or reduced-price health services. Nearly all states have set income eligibility at 185 percent of the poverty level. Nutritional risks include both medical risks, such as anemia, extremes of leanness or obesity, maternal age, or poor pregnancy history, and dietary risks due to poor dietary patterns.

The WIC program is administered nationally by the Food and Nutrition Service (FNS) of the U.S. Department of Agriculture (USDA) and at the state level by a designated state agency, usually the state department of health.[2] Congress sets funding annually, and the available funds are allocated to the states on the basis of an allocation formula that takes into

[2]The WIC program is administered by the Departments of Health in all of the study states.

account the number and percentage of eligible women and children being served, among other measures.

The WIC program is not an entitlement program, and states may not have sufficient funds to serve all eligible persons who apply for the program. Federal regulations thus require that the states establish a nutritional-risk priority system to ensure that scarce program resources are allocated fairly and reach those who need them the most. Priorities I to III are based on nutritional risk established through documented nutritionally related medical conditions, and priorities IV and V are based on nutritional risk defined in terms of inadequate dietary patterns. Priority VI includes postpartum women at nutritional risk, although some states may classify some postpartum women at priority III, IV, or V. At their option, states may define a priority VII, which includes previously certified WIC participants whose nutritional status might regress if they can no longer receive supplemental foods. Pregnant women at nutritional risk as demonstrated by documented medical conditions receive the highest priority (priority I), while pregnant women at nutritional risk due to inadequate dietary patterns are priority IV. During 1987, all five of the study states served priorities I through IV, and all except Minnesota served priorities I through VI.

At the state level, the WIC agency enters into contracts with local agencies to administer the program. WIC agencies are usually within local departments of health, community health centers, or other local public health care providers. The WIC agency is sometimes a community-based organization or hospital. States establish both rules for allocating the state's funds to local agencies and guidelines within which the local agencies must administer the WIC program.

Since the majority of WIC providers are local public health clinics, WIC services have become an integral part of prenatal care provided to low-income women by public clinics. In terms of aggregate expenditures, WIC has become a major component of maternal and child health services at the state and local levels, having grown from a $256 million program that served 848,000 women and children in 1977 to a $2.1 billion program that serves an estimated 4.5 million women and children in 1990.

The organization of program operations at the local level varies greatly, but for pregnant women it works approximately as follows. When a woman learns about the program and applies to the program at the WIC office, she is screened to determine whether she meets the income

criterion and one or more of the risk criteria required for eligibility. If she is eligible, she receives a nutrition education session and a food instrument for the purchase of a food package from a participating vendor. Usually (though not always), application, eligibility determination, service receipt, and health care referrals all occur in the initial visit. In subsequent months, the participant will then return to the WIC office periodically in order to pick up her WIC food instrument and receive nutrition education services. The frequency of food instrument pick-up varies from once every month to once every three months (at which time food instruments for three months are picked up). Participants are eligible for WIC benefits through the end of the pregnancy and up to six weeks postpartum. The mother may then be recertified as a breastfeeding mother, or in some instances as a postpartum participant, in which case she will continue to receive WIC services for an additional period of time.

The WIC programs in the five study states vary greatly in terms of their total budgets, the total number of persons served, and the distribution of the caseload across the eligibility categories. As shown in Table II.2, WIC grants in the five states ranged from approximately $26 million in Minnesota to $112 million in Texas in fiscal year 1987, with intermediate figures of $36 million, $49 million, and $58 million in South Carolina, North Carolina, and Florida, respectively.

Differences in aggregate expenditures are reflected in differences in the total number of persons served by the WIC program. In 1987, the average number of persons served per month ranged from 56,000 in Minnesota to 226,000 in Texas. Data on the proportion of WIC participants who are pregnant women do not exist for all the study states, but information is available on the proportion of participants who are women. These proportions appear to vary considerably, ranging from 15.6 percent in Minnesota to 26.3 percent in Florida. In the other three states, the proportion of participants who are women varies from 21 percent to 23 percent. Thus, in terms of case mix, the Minnesota WIC program has a lower proportion of women and a higher proportion of infants and children than do the WIC programs of the other states, while Florida has a higher proportion of women than the other states.

In contrast to the variation in the size of the program across the study states, the availability and accessibility of WIC services vary somewhat less, although some differences do exist.

TABLE II.2

THE CHARACTERISTICS OF THE WIC PROGRAM IN THE STUDY STATES

	Florida	Minnesota	North Carolina	South Carolina	Texas
Size of the Program					
Total Budget FY 1987 ($ million)	57.8	25.6	49.0	36.2	112.4
Average Monthly WIC Participants, 1987					
Total	117,600	56,300	106,400	73,500	226,300
Women	31,000	8,800	22,000	16,600	51,600
Availability and Accessibility of WIC Services					
WIC Program Statewide	Yes	Yes	Yes	Yes	Yes (Effective April 1990. In 1988, 34 counties were unserved.)
Income Eligibility Criteria	185% of poverty (Statewide, as of July 1988. Previously, 15 counties were below 185% of poverty. Most used 150%.)	185% of poverty (Statewide)	125% - 185% of poverty	185% of poverty (Statewide)	185% of poverty (Statewide)
Waiting Lists	No	Yes (Efforts made to ensure that pregnant women are not placed on waiting list.)	No (But pregnant women experience delays due to constraints in the public prenatal care system.)	Yes (Only with State approval. No waiting lists for Priorities I, II, and III.)	No (But waits for appointments do occur.)

SOURCES: Information collected from site visits, state documents, and interviews with state staff, and data from the Food and Nutrition Service, U.S. Department of Agriculture.

- **Service proximity.** Texas is the only one of the five states that did not have a statewide WIC program during the study period; in 1988, 34 counties out of a total of 254 were unserved. The number of unserved counties in Texas has steadily declined, and the last unserved county received WIC services in 1990. To facilitate access, all of the states use food instrument pick-up sites in addition to certification sites.

- **Income eligibility.** Income eligibility standards are relatively uniform across the five states. Nearly all WIC programs in all five states are using the 185 percent of poverty income criterion, although, in 1987, a few locations in Texas, Florida, and North Carolina may have used a lower income eligibility criterion.

- **Waiting lists.** Strategies for maintaining waiting lists differ among the states, but it is clear that some states face more of a caseload management problem than do others and did so in 1987 as well. In Minnesota, waiting lists and caseload management are important tools in program operations and serve to identify excess demand for the WIC program. The other study states made efforts to minimize the use of waiting lists. While all states affirm that every effort is made to ensure that priority I pregnant women are not placed on waiting lists, the reality may vary by state. In particular, pregnant women may experience delays in enrolling in the WIC program due to constraints on public maternity care or waits for initial WIC appointments.

Medicaid Program

Authorized under Title XIX of the Social Security Act, Medicaid is a joint federal and state program that reimburses the covered medical-care costs of low-income persons. It is the largest program providing reimbursement for health care services to the poor, but by no means are all low-income persons eligible. Eligibility depends on categorical status in addition to income, and states have considerable discretion in determining income eligibility ceilings. In addition, while a core group of services is federally mandated, states can choose to offer a wide range of optional services and can also impose service limits on both mandated and optional services.

For many years, Medicaid eligibility for low-income pregnant women and children was linked to eligibility for Aid to Families with Dependent Children (AFDC). This link effectively excluded low-income pregnant women in two-parent households and low-income women in their first pregnancy, although some states opted to cover some of these women.

In addition, AFDC income eligibility standards in some states were so low that many women below the poverty level were not poor enough to qualify for Medicaid. This problem was particularly severe in the South; in 1987, seven Southern states had AFDC payment standards below 30 percent of the federal poverty level (Hughes et al., 1988), which was $9,056 for a family of three. States have the option of establishing medically needy programs, which have a higher income ceiling, but they are not to exceed 133 percent of the AFDC payment standard. Under a medically needy program, low-income women with high obstetrical and neonatal costs could "spend-down" and become Medicaid-eligible, although they were ineligible for Medicaid during their pregnancies.

The growing awareness of the cost-effectiveness of prenatal care in the early 1980s occurred amid growing concerns about the rising costs of maternity care and the inadequate financing of maternity care. Access problems were particularly severe for low-income pregnant women and infants, many of whom lacked any form of health insurance coverage. In response to these concerns, Congress authorized a series of expansions of the Medicaid program to pregnant women and infants. The mandates of the Deficit Reduction Act of 1984 and the Consolidated Budget Reconciliation Act of 1985 effectively eliminated the Medicaid categorical eligibility requirement that linked Medicaid eligibility to AFDC eligibility and required that states provide Medicaid coverage of prenatal, delivery, and postpartum services to all income-eligible women regardless of their family structure. Subsequent initiatives in the Omnibus Budget Reconciliation Acts of 1986 and 1987 (OBRA-86 and OBRA-87) and the Medicare Catastrophic Act of 1988 have progressively expanded Medicaid income eligibility to pregnant women and children. Legislation under OBRA-86, which became effective during 1987, permitted states to extend coverage to pregnant women and newborns in families whose incomes were up to 100 percent of the federal poverty level, and permitted them to waive the assets test for eligibility. OBRA-87 expanded this option by allowing states to cover pregnant women and infants up to 185 percent of the federal poverty level. All states were required by July 1990 to provide Medicaid coverage to pregnant women and infants below 100 percent of the federal poverty level. Finally, under the Omnibus Budget Reconciliation Act of 1989, states are mandated to expand Medicaid coverage to all pregnant women and children under age six whose incomes are below 133 percent of the poverty level.

The OBRA-86 expansions to 100 percent of the poverty level were not implemented in any of the study states until October 1987, towards the

end of the time period for this study. Thus, for most of 1987, pregnant women and children were potentially eligible for Medicaid in one of the following three groups:

- AFDC recipients who were "categorically" eligible for Medicaid because they received cash assistance under the Aid to Families with Dependent Children Program. In addition, some former AFDC recipients who became ineligible for AFDC payments remained eligible for Medicaid.

- Pregnant women and children who resided in households which met the income and resource requirements of AFDC eligibility, but who were not eligible for AFDC because the state did not provide AFDC benefits to pregnant women without other children (AFDC coverage which is at the state's option) or the child did not meet the definition of "dependent" (that is, both parents were in the home). Women were eligible from the point at which pregnancy was medically established, and birth-related services were covered through 60 days postpartum. Newborn children were covered for one year, provided that the mother was eligible for and receiving Medicaid at birth, and provided that the mother remained eligible and the child resided with the mother.

- Medically needy individuals in families with children whose income and/or resources were above the limits established for AFDC eligibility but still needed medical assistance in the state's view. The state set income limits for the medically needy program that did not exceed 133 and 1/3 percent of the benefits paid to an AFDC case with no other income. A medically needy program was provided at the state's option; however, if the state had a medically needy program, it had to serve pregnant women and children, as defined above. All states in the study except South Carolina had a medically needy program in 1987.

In October 1987, Florida, North Carolina, and South Carolina implemented Medicaid coverage of women and infants in families whose incomes were up to 100 percent of poverty; in September 1988, Texas did also. In July 1987, Minnesota raised the Medicaid income threshold for its medically needy program to 88 percent of poverty; in October 1988, it raised its Medicaid income levels for pregnant women to 185 percent of poverty.

In terms of the services covered by Medicaid, no major service limitations existed that would have affected normal maternal and newborn care. However, some states imposed restrictions that may have limited Medicaid reimbursement for high-cost newborns. In South Carolina, Medicaid allowed a maximum of 18 ambulatory visits--including physicians' visits--a year; however, according to state Medicaid program staff, this restriction probably did not affect most maternal and infant care. In contrast, Texas and Florida imposed service limits during the study year that may have limited the number of days reimbursed by Medicaid for high-cost newborns. During the study period, the Texas Medicaid program paid for a maximum of 30 inpatient hospital days per spell of illness, and required a 60-day break before another reimbursable spell of illness. In addition, it imposed a $50,000 expenditure cap. The cap was subsequently raised to $200,000 in November 1988, with the other service restrictions remaining unchanged. Florida imposed restrictions on both physician visits and inpatient days in 1987. Medicaid recipients were allowed only one physician inpatient hospital visit per day (although other physician services in the hospital could be billed) and a maximum of 45 inpatient days per fiscal year. These limitations were changed effective July 1989. In particular, Florida eliminated limits on hospital days for children younger than age one.

The Omission of the Cost of Indigent Care Programs from the Database and the Analysis

The Congressional mandate for this study requested an assessment of the savings in both Medicaid and indigent care costs for newborns due to prenatal WIC participation. However, determining indigent care costs for pregnant women and newborns is difficult, since many of these costs are borne by the private sector and are seldom documented. This problem is particularly true with delivery and newborn services, for which states have traditionally provided relatively little funding other than through Medicaid, thus forcing hospitals to bear the brunt of uncompensated care costs.

This study does not directly examine the effects of prenatal WIC participation on indigent care costs. Three main reasons explain the omission of indigent care costs from the analysis. First and foremost is that the available data on state indigent care programs are limited. All study states operate programs to serve the needs of low-income pregnant women, and these programs are discussed in detail in another report from this study, "Description of State Programs" (Bilheimer, 1990). However, these programs often do not maintain individual-level data files on services received and costs incurred. In particular, a major source of concern is the high level of uncompensated hospital care for maternity and newborn care, and it is not possible to obtain individual-level data on

uncompensated hospital care within the context of this study. In order to be applicable to this study on the cost-effectiveness of the WIC program, a health care service or reimbursement program must have had data files on individuals that could be linked to WIC program records.

A second reason for omitting indigent care costs from the analysis is that many programs which serve low-income pregnant women provide only prenatal care to participants, and do not cover labor and delivery costs. Thus, even for those programs for which individual-level program data systems are maintained at the state level, information is not available on the primary outcome variable for the analysis--indigent care costs for labor and delivery and during the 60-day period after birth.

A third reason for omitting state indigent care costs from the study is that some of the state programs that provide financial assistance at and after birth exist precisely because of problems related to the pregnancy and birth. For example, in many states, Programs for Children with Special Health Needs reimburse providers for services rendered to children born with serious health needs. Thus, in order to be a participant in such a program, the newborn is by definition a high-cost birth, and it is of little interest to examine the effects of the WIC program on program costs. If any analysis of such programs were to be undertaken, it would likely focus on the effect of the WIC program on the likelihood of receiving any benefits at all, rather than on the costs received once in the program.