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**Income Variability
Among Families with
Pregnant Women,
Infants, or Young
Children**

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KEY FINDINGS

BACKGROUND

The Special Supplemental Nutrition Program for Women, Infants, and Children (WIC) provides supplemental food, nutrition education, and referrals to health care to eligible pregnant and postpartum women, infants, and children. To be eligible for WIC, participants must be categorically eligible (that is, they must be pregnant women, breastfeeding women up to 12 months postpartum, nonbreastfeeding women up to 6 months postpartum, infants up to 12 months of age, or children up to the fifth birthday). Participants also must be income eligible (defined as having family income below 185 percent of the poverty level) and at nutritional risk. The Food and Consumer Service (FCS) of the U.S. Department of Agriculture, which administers WIC, annually estimates the numbers of infants and children who are both categorically eligible and income eligible for WIC on the basis of the March Current Population Survey (CPS). These estimates are used in developing the program budget and in estimating program coverage.

FCS asked Mathematica Policy Research, Inc., (MPR) to assess the CPS estimates in relation to alternative estimates from the Survey of Income and Program Participation (SIPP), which collects longitudinal monthly income data. FCS wished to examine the following issues pertinent to income eligibility estimates:

- ***Annual Versus Monthly Income Measures:*** The CPS estimates must use annual income to assess eligibility, although WIC program staff members in general use monthly income to evaluate eligibility.¹ On the basis of previous literature on income variation around the poverty level, it seemed likely that monthly eligibility rates would be higher than annual rates. This could have implications for estimates of WIC participation rates that compare the number of participants from administrative data with estimates of the number of eligible people. Estimates using data from the CPS sometimes have indicated a participation rate for infants that is more than 100 percent.
- ***Changes in Income, Program Participation, and Other Characteristics Around a Birth:*** It seemed likely that the rate of income eligibility increases around the time of the birth (and for

¹Because the WIC program does not specify a definite income period for eligibility determinations, states have broad flexibility in measures used. However, according to FCS, states most often use monthly income in determining eligibility.

some period thereafter), as working women withdraw from the labor force at least temporarily. This could have implications for estimates of eligible pregnant women, which are based on the number of eligible infants. Trends in program participation and other characteristics associated with WIC eligibility and participation were also of interest.

**COMPARISON OF
ANNUAL AND
MONTHLY
MEASURES OF
INCOME
ELIGIBILITY FOR
WIC**

Key findings from the first phase of the analysis include:

- The proportion of infants and children income eligible for WIC was about 42 percent during the period 1990 to 1992, both when measured with the CPS and when measured with SIPP using annual-income methods that mimic the CPS estimates.
- Estimates of income eligibility in SIPP based on annual income were not significantly different from estimates based on monthly income, when estimates were based on the sample for whom annual income could be computed. For children ages 1 to 4, alternate monthly income estimates from the broadest possible SIPP samples were slightly but significantly higher (by 1 to 2 percentage points) than estimates from the restricted sample, but they are not directly comparable to the annual income estimates. Even using the broader estimates, the differences between the annual and monthly estimates were not substantial relative to what had been expected on the basis of the poverty literature.
- Estimated participation rates for infants were close to 100 percent regardless of whether annual or monthly measures of income eligibility were used.
- About 25 to 30 percent more infants and children are income eligible for WIC in *some* month of the calendar year than are income eligible on average. Since individuals are certified for WIC for up to 12 months, the proportion eligible in any month of the past year is an upper-bound estimate of those who could potentially be on WIC.

**TRENDS IN
INCOME
ELIGIBILITY
AND OTHER
CHARACTERISTICS
DURING
PREGNANCY AND
THE YEAR AFTER
BIRTH**

Key findings from the second phase of the analysis, which examined data on mothers and infants over the year before and the year after a birth, are as follows:

- Holding family size constant, the proportion of women income eligible for WIC increases gradually during pregnancy, takes an abrupt jump at birth, and then declines gradually during the year after birth (see Figure 1). The increase in the proportion of women who were income eligible for WIC (from 32 percent in the quarter before pregnancy to 46 percent in the quarter after birth) was due roughly equally to the increase in family size and the decline in family income.
- The characteristics of women income eligible before a birth are different than those of women income eligible after a birth. In particular, women who were income eligible after the birth, on average, were more educated, were more likely to live with the father, were more likely to be white, and had fewer children than those who were income eligible during pregnancy.

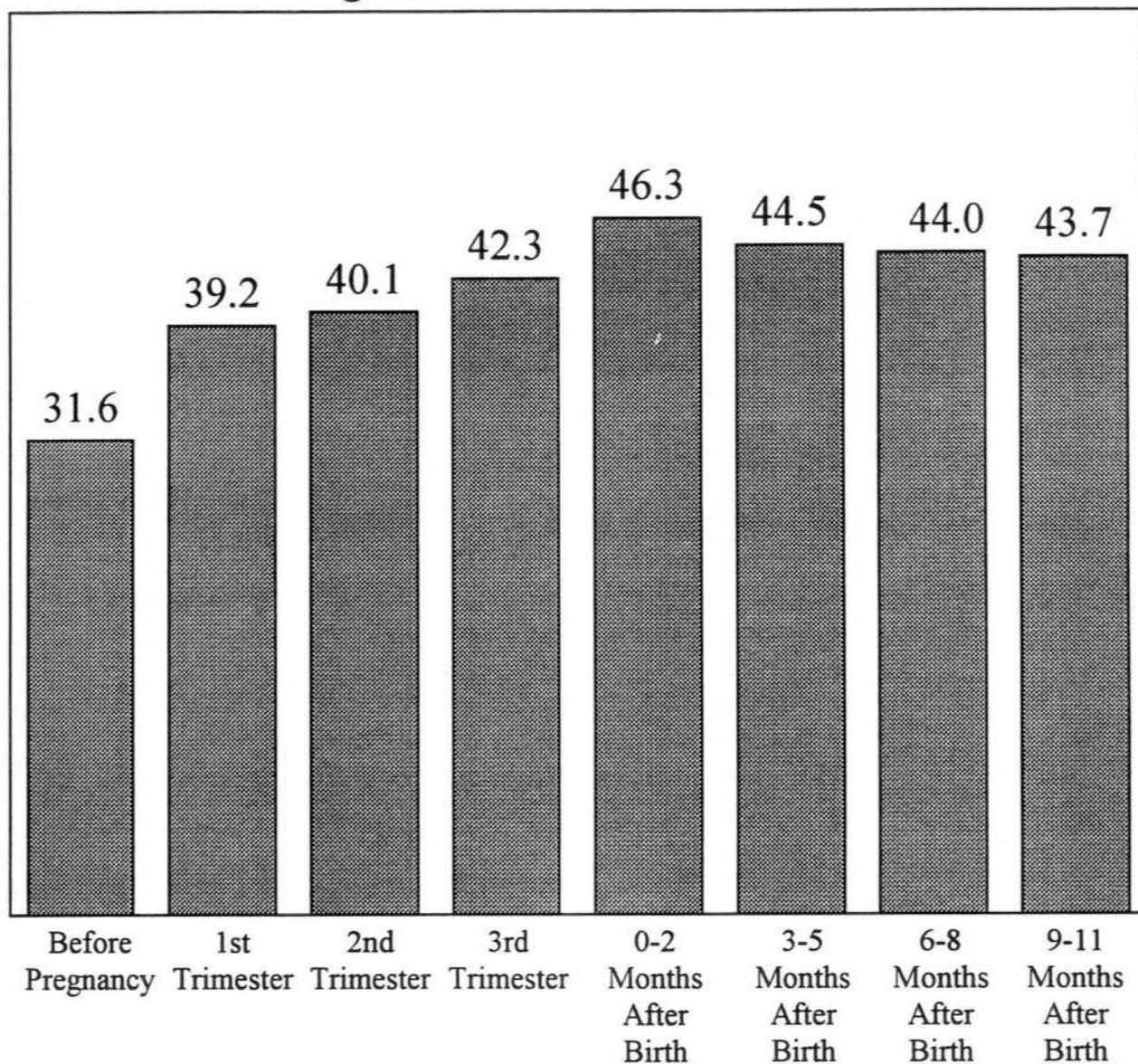
**PARTICIPATION
IN WIC AND
OTHER PROGRAMS**

The reported rates of WIC participation among income-eligible pregnant women and infants are much lower than participation rates typically estimated from administrative data. Reported participation rates for children are closer to the administrative data. Underreporting of participation in WIC and other programs implies that the following findings concerning reported patterns of program participation and characteristics of participants may not generalize to the full population of participants:

- Infants and children who were intermittently eligible for WIC but not eligible on an annual basis were less likely to participate in WIC and other assistance programs than those annually eligible.
 - Among those eligible in all months, three-quarters report Medicaid and about half report WIC.
 - Among those annually eligible but not eligible in all months, about 30 percent report WIC and Medicaid.

FIGURE 1
TRENDS IN INCOME ELIGIBILITY FOR WOMEN
BEFORE AND AFTER BIRTH

Percent Income Eligible



SOURCE: 1990 and 1991 SIPP panels.

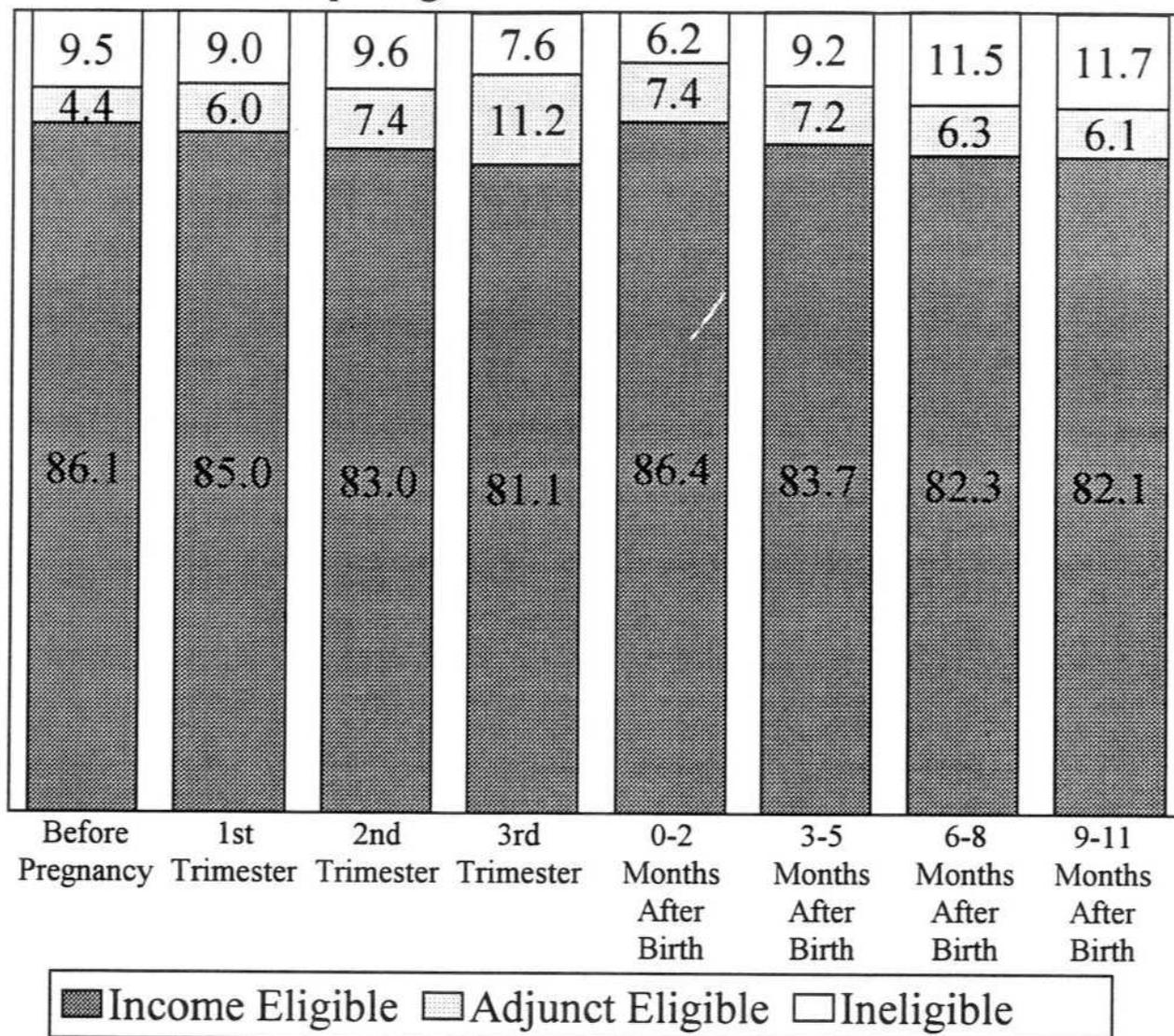
NOTES: In each quarter all women with data for that quarter were included. Income eligibility is defined as family income less than 185 percent of the WIC poverty guideline. Pregnant women were counted as two in determining the applicable threshold, as is current WIC policy.

- Among those eligible in some months but not on an annual basis, about 10 percent report WIC and Medicaid.
- Throughout the period around the birth, about 15 percent reported of WIC participants were not income eligible in the quarter in which their participation was measured. About one-third to one-half of this group were eligible on the basis of Medicaid or other program participation; others may have been income eligible when certified but were not any longer (see Figure 2).

FIGURE 2

ELIGIBILITY STATUS OF FAMILIES OF REPORTED WIC PARTICIPANTS BEFORE AND AFTER BIRTH

Percent of Participating Families



SOURCE: 1990 and 1991 SIPP panels.

NOTES: The sample in each quarter is all women who report that they or a family member participated in WIC in that quarter. WIC participation is substantially underreported in SIPP; thus, results should be interpreted with caution. Income eligibility is assessed on the basis of quarterly income.

Adjunct eligible here indicates families who were not income eligible but who participated in AFDC, Food Stamps, or Medicaid (usually Medicaid). At the time these data were collected, pregnant women were counted as one family member in the WIC program, but as two family members in the Medicaid program. Ineligible participants may have been eligible at the time of certification.

I. INTRODUCTION

The Special Supplemental Nutrition Program for Women, Infants, and Children (WIC) provides supplemental food, nutrition education, and referrals to health care to eligible pregnant and postpartum women, infants, and children. To be eligible for WIC, individuals must be categorically eligible (that is, they must be pregnant women, breastfeeding women up to 12 months postpartum, nonbreastfeeding women up to 6 months postpartum, infants up to 12 months of age, or children up to the fifth birthday). Each categorically eligible individual also must be income eligible (defined as having family income below 185 percent of the poverty level) and at nutritional risk.¹ Those who participate in Aid to Families with Dependent Children (AFDC), the Food Stamp Program (FSP), or Medicaid are *adjunct eligible* (that is, automatically income eligible) and do not have to show further proof of income.

The Food and Consumer Service (FCS) of the U.S. Department of Agriculture (USDA), which administers WIC, currently develops estimates of the numbers of women, infants, and children who are both categorically and income eligible for WIC on the basis of the annual March Current Population Survey (CPS). Because these estimates are used in developing the program budget and in allocating program funds among the states, FCS is concerned with assessing these estimates in relation to alternatives.² In addition, FCS is considering development of a microsimulation model of the WIC program. An issue in designing such a model is whether it should be based on the CPS and the current methodology for estimating income eligibility for WIC.

Current estimates, based on the March CPS, identify categorically eligible infants and children on the basis of their age in March and evaluate income eligibility on the basis of annual family income in the previous calendar year, the only income period the CPS covers. The number of income-eligible pregnant women is estimated on the basis of CPS data on infants, since

¹A competent health professional must assess nutritional risk. The assessment must include measures of height, weight, blood-iron status, and dietary status. Common nutritional risks include overweight, underweight, anemia, inadequate or inappropriate dietary intake, as well as a wide range of risks specific to pregnancy (such as history of pregnancy loss or low-birthweight births).

²Estimates of eligible children in each state from the CPS are adjusted using sophisticated "shrinkage" estimation techniques (Schirm 1995). The shrinkage estimates of eligible children in each state are used as input into the allocation formula.

pregnant women are not identified in the CPS. The number of pregnant women is assumed to be three-quarters of the number of income-eligible infants (based on the assumption that pregnancy is 9 months long, on average).³ The measure of eligible pregnant women reflects program rules that count a pregnant woman as two family members for the purpose of assessing poverty levels during pregnancy; counting the pregnant woman as two has been the practice of the Medicaid program for some time (thus affecting adjunct eligibility through Medicaid) and has been the rule used in determining WIC eligibility since December 1994.

FCS wished to reexamine the CPS income eligibility estimates in several respects:

- The CPS estimates use annual income to assess eligibility, although WIC program staff members in general use monthly income to evaluate eligibility.⁴ It seemed likely that monthly eligibility rates would be higher than annual rates, on the basis of previous literature on income variation around the poverty level.
- Estimates of WIC participation rates that compare numbers of participants from administrative data with estimates of the number of eligible people from the CPS have sometimes indicated a participation rate for infants that is more than 100 percent. This discrepancy could, in part, reflect underreporting of income eligibility in the CPS.
- The assumption that the number of income-eligible pregnant women equals three-quarters the number of income-eligible infants implies that family income does not change after the birth. It seemed likely, however, that the rate of income eligibility increases around the time of birth (and for some period thereafter), as working women withdraw from the labor force at least temporarily.

³For additional information on current methods for estimating eligibility for WIC, see U.S. Department of Agriculture 1987.

⁴Because the WIC program does not specify an income period for eligibility determinations, states have broad flexibility in measures used. However, according to FCS, states most often use monthly income in determining eligibility.

To assess these issues, FCS requested that Mathematica Policy Research, Inc., (MPR) analyze income variation among families with members categorically eligible for WIC using data from the Survey of Income and Program Participation (SIPP). SIPP provides longitudinal monthly data on family composition, income, and participation in WIC, AFDC, FSP, and Medicaid.

Measurement of income eligibility for WIC also would be a key component of any WIC microsimulation model. Therefore, other motivations for this analysis were to provide help in deciding whether SIPP or the CPS should be the core database in a WIC microsimulation model and to examine, if SIPP were recommended as the core database, how to reconcile the SIPP-based estimates with the eligibility estimates from the CPS.

On the basis of these concerns, FCS asked MPR to investigate the following research questions:

- Are there significant differences between income eligibility estimates from SIPP that use monthly and annual income? Are there significant differences between SIPP-based income eligibility estimates measured using annual income and CPS-based estimates?
- Using estimates of income eligibles computed from SIPP and estimates of participants from WIC administrative data, how do the estimated participation rates for infants and children vary with the method of estimating income eligibility for WIC?
- How much variation is there in income eligibility during the periods before, during, and after pregnancy? How are these income patterns related to other family characteristics?
- What are the patterns of participation in Medicaid and other programs among WIC income eligibles and WIC participants? What was the role of adjunct eligibility through Medicaid in increasing WIC eligibility during the early 1990s?

Appendix A reviews the literature pertinent to this study, which consists of three groups of studies: (1) comparisons of measures of poverty that use SIPP and the CPS, (2) comparisons of monthly and annual estimates of poverty from SIPP, and (3) studies of changes in women's employment

behavior and in family incomes around the time of a birth. In general, the literature finds that poverty rates are higher when measured on a monthly basis than on an annual basis. Fluctuations in income and associated spells of poverty are more common for those with certain family characteristics: two-parent families and the unemployed. Pregnancy and birth tend to have a negative impact on family income and poverty status. Women employed before childbirth tend to begin working again within a few months of childbirth, however, and this suggests that the drop in income is often brief.

Chapter II describes SIPP and the two sets of analysis files constructed from SIPP to address the research questions outlined previously. Chapter III compares monthly and annual estimates of income eligibility for infants and children and assesses the implications of the alternative measures for participation rate estimates. Chapter IV presents data on variations during the 2 years surrounding a birth in income eligibility for WIC and considers how the characteristics of income-eligible women change over the period. Finally, Chapter V examines the relationship between WIC income eligibility and participation in WIC and other programs. Findings concerning program participation must be interpreted with caution, however, because of the substantial underreporting of participation in WIC and other programs in SIPP.

II. DESCRIPTION OF DATA AND ANALYSIS FILES

Two databases were developed from the 1990 and 1991 panels of the Survey of Income and Program Participation (SIPP) to address the research questions described in Chapter I. The first database was created to compare Special Supplemental Nutrition Program for Women, Infants, and Children (WIC) eligibility estimates based on monthly income with those based on annual income and to compare the characteristics of infants and children eligible over different periods. It was also used to compare the number of infants and children eligible for WIC with the number of participants. The second database was created for the analysis of income dynamics surrounding a birth and the analysis of patterns of participation of pregnant women in WIC and other programs. This chapter first provides a general description of SIPP. It then offers brief descriptions of the two databases developed for this project. More information on the two databases can be found in Appendix B.

THE SURVEY OF INCOME AND PROGRAM PARTICIPATION (SIPP)

SIPP is a nationally representative longitudinal survey that provides detailed monthly information on household composition, family composition, income, labor force activity, and participation in government programs such as WIC, Medicaid, Aid to Families with Dependent Children (AFDC), and the Food Stamp Program (FSP). A new sample is selected for SIPP on a regular basis (originally, every year) and interviewed repeatedly; each set of interviews based on the same original sample is referred to as a panel (U.S. Department of Commerce 1994).

This report uses data drawn from the 1990 and 1991 panels of SIPP. The 1990 panel began in February of that year with a sample of approximately 21,900 households (of which roughly 3,000 constitute an oversample of black, Hispanic, or female-headed households). The 1991 panel began the following February with a sample of about 14,300 households. Sample households within each panel are divided into four subsamples of roughly equal size, referred to as *rotation groups*. One rotation group is interviewed each month. Each cycle through the four rotation groups using the same questionnaire is called a *wave*. This interview schedule results in each household in the sample being interviewed at 4-month intervals. There were eight waves in each of the SIPP panels discussed here, providing up to 32 months of income and program participation data for each sample person.

At each interview, information is collected about the prior 4 months. Thus, the 1990 SIPP panel covers the period from October 1989 through August 1992, and the 1991 SIPP panel covers the period from October 1990 through August 1993. Because these two panels both cover the period from October

1990 through August 1992, this report combines data from the two panels for analyses covering the 1991 calendar year.

The U.S. Census Bureau attempts to interview all adults (persons age 15 or older) present at the time of the first interview. Persons under age 15 who are members of originally sampled households are also considered sample members, and relevant information is collected about them. During subsequent interviews, the original sample members and any persons living with them are considered part of the sample for that wave. Interviews are attempted with all adult sample members, and relevant information is collected about all sample members under age 15.

The Census Bureau creates files with data for each wave of interviews. Upon completion of the final wave of interviews in a given panel, the Bureau constructs a full-panel longitudinal research file. To construct these files, the Bureau links the data collected for each sample person over the life of the panel; each record contains the stream of data for a single person.

As in all longitudinal surveys, not all of the original sample members complete later SIPP interviews. Such attrition is one potential source of bias in the analyses presented in this report. For example, 25 percent of the 58,288 persons who completed interviews in the first wave of the 1990 SIPP panel were nonrespondents for at least 1 later month.¹ If sample members who drop out of the sample are different from those who remain, analyses that do not account for these differences may yield biased results. The Census Bureau attempts to compensate for some differences by adjusting the sample weights provided with the files. In the analyses reported here, there is no attempt to adjust for attrition bias other than by using the Census Bureau weights. If the sample must be restricted to cases that have complete data over periods longer than one SIPP wave (as in the first database discussed next), the sensitivity of the results to that restriction is examined (to the extent feasible). If possible, the influence of attrition is minimized by including all cases with valid data at each point in time, instead of restricting the sample to cases with complete data over time (for example, the second database has this structure).

“Seam bias” is another widely recognized problem in longitudinal data that may affect the analyses. SIPP purports to contain monthly data, but a wide literature shows that transitions in status are more likely to occur on the “seam” between interviews (for example, between the fourth month of the first wave and the first month of the second wave) than at other times (see Klerman 1991 and references cited therein). For example, Klerman finds that transitions in health insurance coverage and employment are two to four times more likely to be reported at the seam than they would be if transitions were evenly distributed across the 4 months. The explanation is that individuals

¹Another 10,827 persons were not sample members during the first wave of the 1990 panel but were interviewed during at least one of the later waves of interviews.

report current status as having been constant over the full reference period for the interview (in this case, 4 months), because of failure to recall changes or because of a desire to limit the duration of the interview. However, because the analyses in this report are built around reference periods not determined relative to interview months, seam biases in the numbers reported by different individuals may cancel each other out. Furthermore, recall is still likely to be more accurate with SIPP's frequent interviews than in surveys with annual or longer recall periods, such as the Current Population Survey (CPS).

OVERVIEW OF THE FIRST DATABASE

The first database is used to compare WIC eligibility estimates on the basis of monthly versus annual income and to compare estimates of WIC eligibles and participants. It contains three files, corresponding to each of the 3 calendar years this study covers (1990, 1991, and 1992). Each calendar year file contains data describing the income, program participation, and family composition of each person for 12 months.² Each file also contains information about each person's family as defined in March of the subsequent year. This information allows researchers to use this database to mimic the family definition and income period covered in the official, CPS-based, WIC eligibility estimates.

Each of the 3 calendar year files was constructed as follows: a subsample was selected of persons in the SIPP sample for all 13 months of interest (the entire calendar year and the following March) who lived in households in which all adults (age 15 and older) present in the second March were also in the SIPP sample (although not necessarily in the same household) for all 13 months. This subsampling was necessary to compute a measure of WIC eligibility that mimics the CPS. The calendar year weights that the Census Bureau provided were adjusted to account for this subsampling (see Appendix B). Even with this adjustment, the children in this database live with more stable adults than those in the full calendar year file, which may introduce some bias into the estimates. The sensitivity of the monthly income estimates based on this subsample to these restrictions was tested by comparing them to monthly income estimates from the unlinked core files from each wave of interviews, which include the maximum available sample in each month. As described further in Chapter III, for some groups, slightly higher eligibility rates were found using the broader sample, but there was no indication of a major bias.

The file contains two sets of income and poverty measures for each person. The first set mimics the methods used in estimating income and poverty from the CPS. Annual family income and poverty are estimated assuming that the same family composition that existed in March existed for the entire prior calendar year. The second set of income and poverty measures is based on observed family composition in each month of the calendar year. Each file

²The 1990 panel provided data for calendar years 1990 and 1991, and the 1991 panel provided data for calendar years 1991 and 1992.

also contains monthly information on each person's demographic characteristics, labor force participation, and program participation.

OVERVIEW OF THE SECOND DATABASE

The second database contains a single file constructed from the 1990 and 1991 SIPP panels. It is used in the analysis of the dynamics of mothers' income, eligibility, and program participation during the months surrounding a birth. The file contains all women who had a birth just before or during the SIPP panel in which they appear.³ The file contains 24 months pertinent to this study: the 2 months prior to pregnancy, the 9 months of pregnancy, the birth month, and 12 postpartum months.

The file includes as much information as possible about these women for the year before and after they gave birth. A standard set of demographic variables for each woman was extracted, as well as monthly data on the woman's family composition, family income, labor force participation, and program participation.

These new mothers may not have been in the SIPP sample for the whole panel, however. If they were observed for the full panel, the full period of interest may not have overlapped with the period the panel covered. (The latter situation arose whenever a birth occurred before the 12th month or after the 20th month of the SIPP panel.) Thus, the file contains *up to* 24 months of information about the experiences of mothers around the time of each birth.

Because the file is anchored around the birth month, it does not cover a fixed calendar period. Each month of postbirth data may be drawn from any month between October 1989 and August 1993. Trends in the economy during this period will tend to average out and thus not affect the observed trends around the birth.

The analyses based on this file, presented in Chapters III and V, use data on every woman observed for the specific period of interest (usually a 3-month term). For example, measures of income during the first 3 months of pregnancy are based on all women in the file observed for *that* period and exclude all women not observed for that period. Similarly, measures of income for the 3 months following the birth event are based on all women observed for *that* period. While the two sets of women in this example contain many of the same individuals, they are different samples. This approach minimizes (but may not eliminate) the effects of attrition bias and maximizes the effective sample size for each estimate. However, because estimates for different periods are based on different samples of women, comparisons of these estimates should account for possible differences in the

³Because SIPP does not directly assess pregnancy and birth, this study identified these events indirectly by selecting all infants under 1 year old at any point in the panel and linking their records with their mother's records. Appendix B describes this process in detail.

composition of the samples. Furthermore, the use of different samples for different periods implies none of the weights provided by the Census Bureau is appropriate for this file. All analyses of the file are thus unweighted; reasons for this decision are described further in Appendix B.

III. COMPARISON OF ESTIMATES OF ELIGIBILITY AND PARTICIPATION RATES BASED ON MONTHLY AND ANNUAL INCOME

As discussed in Appendix A, research on the effects of using monthly versus annual accounting periods on measured poverty levels reveals higher poverty rates using a monthly accounting period, as well as considerable movement into and out of poverty over the course of a year. This past research suggested that, since WIC income-eligibility estimates are based on annual income, the estimates may understate income eligibility for WIC, which is generally based on monthly income. However, the WIC eligibility threshold is substantially higher than the poverty level. The dynamics of income around the higher WIC threshold (185 percent of poverty), and for the specific population served by WIC (children under age 5), do not necessarily match the patterns observed around the poverty level. This chapter investigates the relationship between WIC income-eligibility estimates based on annual income and estimates based on monthly income.

The research questions addressed include:

- Are the numbers of infants and children eligible for WIC on the basis of annual income substantially different from the numbers eligible on the basis of monthly income?
- What proportion of infants and children are ever eligible for WIC over the course of a year, and how does this compare to the proportion eligible in a typical month, or on the basis of annual income?
- What are the characteristics of those with different patterns of WIC income eligibility over the course of a year?
- How are estimates of WIC participation rates affected by the data and time period used to estimate income eligibility?

METHODS FOR ESTIMATING INCOME ELIGIBILITY FOR WIC

This section describes four methods for estimating the percentage of infants and children income eligible for WIC. The next section and (in more detail) Appendix C present the results of each method. The four alternatives are:

1. Estimates from the March CPS, which are based on annual income in the prior calendar year

2. Estimates from SIPP that mimic the CPS annual income measure and family definition
3. SIPP estimates based on monthly income
4. SIPP estimates based on those who are income eligible in any month of the year

CPS Estimates

Estimates from the March CPS were computed using the same methods as those currently used by FCS to derive the official estimates of income-eligible infants and children. These estimates are based on the annual income of the family during the previous calendar year. The 1990 estimates were computed from the March 1991 CPS, the 1991 estimates from the March 1992 CPS, and the 1992 estimates from the March 1993 CPS. In each case, family composition was determined at the time of the March survey. Family income was computed by summing the incomes reported for the prior calendar year of adults who were members of the family as it existed at the time of the survey. The poverty guideline was set for each family on the basis of its size at the time of the March survey, and a WIC income-eligibility threshold was set at 185 percent of that poverty guideline. Because the WIC program adopts new DHHS poverty guidelines in July of each year, the thresholds used here are based on the average of the two guidelines in effect in the calendar year in question. Children are classified by their age in March and are classified as income eligible for WIC if the family's income in the prior year was less than the eligibility threshold.

SIPP Annual Income Estimates that Emulate the CPS Estimates

Using the first analysis database (described in Chapter II), the SIPP annual income estimates were computed using procedures that emulate the CPS-based estimates as closely as possible. The 1990 estimates were computed using data from the 1990 SIPP panel, the 1991 estimates were computed using data from both the 1990 and the 1991 SIPP panels, and the 1992 estimates were computed using data from the 1991 SIPP panel. In each case, family composition was determined in March of the year *after* the reference year (for example, for the 1990 estimate, family composition was determined in March 1991). This is the "CPS family." Annual personal income for the reference year was determined for each adult in the CPS family. These annual personal incomes were then summed to arrive at a CPS family annual income for the reference year. WIC eligibility thresholds were computed for each CPS family using the same procedures applied to the CPS. As in the

estimates from the CPS, children were classified by their age in March and were income eligible for WIC if their CPS family's income in the prior calendar year was less than the eligibility threshold.¹

These SIPP annual income estimates, computed with data from SIPP but using methods that emulate the CPS, serve as baselines against which two other SIPP-based approaches to eligibility estimates (described next) are compared.

SIPP Average Monthly Estimates

The third method of estimating income eligibility for WIC involves computing separate estimates for each month of the reference year, based on family income and composition in that month, and then averaging those 12 monthly estimates. For example, for the January estimate, each person's family composition was determined for that month. The income of all family members over age 14 received in January was summed to arrive at a January family income. A WIC eligibility threshold was determined on the basis of the size of the family in January, and children were classified as income eligible if their family income for January was below that threshold. Estimates for each of the other 11 months were prepared similarly.

For these estimates, the age of the child is evaluated on a month-by-month basis. Thus, the January estimate for infants includes all children under age 1 in January, the February estimate includes all children under age 1 in February, and so on. Some children who were infants in January reached their first birthday by February, and some who were infants in February had not yet been born in January. More generally, in each month, some children "aged into" and some children "aged out of" the WIC-relevant age groups. As a result, each monthly estimate is based on a slightly different sample of

¹Infants born during the calendar year were assigned weights on the basis of their parents' weights (see Appendix B). In assessing WIC eligibility of infants in the CPS family, however, it became clear late in the process of preparing this report that weights had not been assigned to infants born in January through March of the second calendar year. Thus, the sample of infants for the SIPP annual income measure does not contain all infants in March. This problem was corrected in the estimates of the number of eligible infants presented in Table III.7 for 1992, and it was determined that the eligibility rates for 1992 were unchanged. On the basis of the latter finding, the rest of the tables in this chapter have not been adjusted; the annual income estimates for infants include only infants born between March and December of the prior calendar year.

children, and these monthly samples differ in composition from the sample used for the SIPP annual income estimate.

Because there is seasonal variation in income, one would expect seasonal variation in the number of persons with family incomes below the WIC eligibility threshold. Monthly estimates of the percentage of persons income eligible for WIC also may be sensitive to transitory shocks to the economy. Although measures that take into account such month-to-month variation might be useful for allocating resources over the course of the year, that same variation makes any single month's estimate a poor basis for estimating the percentage of persons income eligible for WIC in any other month or in an average month. The percentage of persons who are income eligible for WIC in an average month is more useful when preparing annual budget projections. Therefore, the analysis focuses on the simple average of the 12 monthly estimates.

Two approaches were taken to developing average monthly estimates from SIPP. The first approach, designed to allow direct comparison with SIPP annual estimates described above, was to develop average monthly estimates using the first analysis database. This sample is limited to children for whom the annual income of the CPS family could be calculated. However, because children with stable family composition and without missing data may have lived in families with less fluctuation in monthly income, an alternative average monthly measure was also calculated. These estimates were developed using unlinked SIPP wave files, which include the maximum sample available in SIPP for each month. Income eligibility in each calendar month was assessed in each wave file using the same methods as described above, and the monthly sample weights attached to each wave file were used to weight the data. Again, the 12 monthly estimates were simply averaged. Although this alternative set of estimates reflects the broadest sample available from SIPP, it is not, however, based on the same sample as the SIPP annual income measure. The annual income measure for each wave's sample cannot be calculated directly from the data (since not all individuals have a full year of data) and might differ from the annual income measure described in the preceding section. Therefore, in this analysis, we focus primarily on the first average monthly estimate.

SIPP Estimates of Eligibility in Any Month

The final measure of income eligibility counts infants and children who were income eligible for WIC *in any month* of the reference calendar year. This measure is of interest because it may mirror program practice more closely than the other measures. WIC income eligibility is generally determined using monthly, not annual, income. Recertification of eligibility only takes place every 6 to 12 months, however.² In any month, WIC program participants include mothers and children with incomes below the eligibility threshold in that month, along with mothers and children who were certified during the prior 6 to 12 months but whose incomes are not below the threshold in that month. Over time, the program accumulates new mothers and children as they become eligible, but drops persons who become income ineligible only after a delay of up to 12 months. The count of all those who ever dropped below the eligibility threshold over the course of the past year is, thus, an upper bound on those who could be certified for WIC at any point.

Estimates of those ever eligible for WIC were also based on the first analysis database, since it was necessary to have data on family income for the sample for each month of the calendar year. To prepare these estimates, age and WIC income eligibility of each child was evaluated for each month of the calendar year. The percentage of children who had 1 or more months of eligibility while they were in the age category of interest during the calendar year was then tabulated.³

Without further constraints, this “ever eligible” measure would pick up many middle-class children who had single months with low family incomes but who would be unlikely to be on WIC. Such children might include the children of schoolteachers or college professors who receive no income from their teaching jobs for 3 months of each year. They might also include children whose parents work in agriculture or construction, industries where earnings are generally lower during the winter months than at other times of

²Pregnant women are generally certified until 6 weeks after birth, infants are generally certified until age 12 months, and postpartum women and children are generally certified for 6-month periods.

³One problem with this measure is that most infants and some children do not have data for all 12 months of the calendar year. The percentage of infants or children with any months eligible within a year will thus be somewhat understated. Appendix E describes an investigation of the potential biases caused by this problem. On the basis of the results presented in Appendix E, the bias is small.

the year. This problem was addressed by imposing a second constraint based on *annual* family income. The results presented in this chapter show the percentage of children in each age group with *annual* family incomes less than three times the poverty level who also had at least *1 month* during the calendar year with family income below the WIC eligibility threshold.⁴ Appendix C provides alternate estimates using annual income thresholds ranging from two to three times the poverty guideline.⁵

ALTERNATIVE ESTIMATES OF INCOME ELIGIBILITY

This section presents estimates of the percentages of infants, children ages 1 to 4, and all children under age 5 who are income eligible for WIC using each of the measures just discussed. Because there were no significant differences across years in the estimates from SIPP, the discussion focuses on the estimates that pool the data from the 3 years.⁶ Appendix C (Tables C.1 to C.3) presents estimates for each year. Appendix C also presents estimates of the differences between and ratios of the alternative estimates, and their standard errors, for each year separately and for the pooled sample (see Table C.4 for the results for the pooled sample). Appendix D provides a discussion of the jackknife procedure used to estimate the standard errors reported in Appendix C.

⁴Unlike the *annual income* estimate, the annual income-to-poverty ratio used here takes full account of changing family composition over the course of the year. For each person, family income was computed for each of the 12 months. Each person was also assigned a DHHS poverty guideline threshold on the basis of the size of that person's family in each of the 12 months. For each person, then, the sum of the 12 monthly family incomes was compared to the sum of the 12 thresholds to determine that person's annual income-to-poverty ratio.

⁵More than 98 percent of all children in families receiving WIC benefits in 1992 (as reported in SIPP) had annual family incomes less than three times the poverty line.

⁶For each of the three age groups, the estimates of WIC income eligibility across the 3 years are similar. Furthermore, the relationships between the alternative estimation approaches also appear quite stable across years. For example, the ratio of the average monthly estimate and the SIPP annual income estimate is similar in each year. An analysis of variance failed to identify any year effects in either the levels of WIC income eligibility or in the relationships between the alternative approaches that were statistically significant at the 95 percent confidence level.

**Estimates of WIC
Income Eligibility
Based on Annual
Income from CPS
and SIPP**

For both infants and young children, the SIPP estimates of WIC income eligibility based on methods that emulate the March CPS are essentially the same as the CPS estimates (compare the first and second rows of Table III.1). Both data sources indicate that about 42 percent of infants and young children were income eligible for WIC when an annual accounting period is used and family composition is fixed.

The similarity of the two sets of estimates is somewhat surprising. SIPP is believed to provide more complete information on income than the CPS, due to the shorter recall period and the greater detail in its questions on income sources. If comparable families reported higher incomes in SIPP than in the CPS, the percentage of persons with family incomes below a specified threshold would be lower in SIPP than in the CPS. This study's findings suggest that, at least among families with young children and incomes near or below the WIC eligibility threshold, comparable families report comparable annual incomes in SIPP and the CPS.⁷

**Estimates of WIC
Income Eligibility
Based on Monthly
Income**

Although state and local agencies have considerable flexibility in the precise income accounting period used, WIC eligibility is generally based on monthly income. Thus, estimates that rely on annual income may not accurately assess who would be deemed eligible if they were to apply for benefits. Some of those with annual incomes above the eligibility threshold could well have some months with incomes below that threshold; others with annual incomes below the threshold could have some months above it. On the basis of the poverty literature reviewed in Appendix A, it seemed likely that the former group would be larger and, thus, that estimates of the number of eligibles based on monthly income would be larger than those based on annual income.

Contrary to this expectation, the results presented in the third line of Table III.1 indicate that the annual estimates and the comparable average monthly estimates are very close; furthermore, the differences between the estimates

⁷As discussed in Chapter II, the analysis sample is constrained to those with full data on family income in the prior calendar year. These families may have higher annual incomes than the full SIPP sample, since nonresponse is correlated with income, making the comparability between SIPP and the CPS even more surprising. This issue is discussed more fully in the next section.

TABLE III.1

ALTERNATIVE ESTIMATES OF PERCENTAGE OF INFANTS AND YOUNG CHILDREN INCOME ELIGIBLE FOR WIC
(Pooled Data for Calendar Years 1990 to 1992)

	Infants (Less than 1 Year Old)		Young Children (Ages 1 to 4)		Infants and Children (Ages 0 to 4)	
	Percentage or Proportion	Standard Error	Percentage or Proportion	Standard Error	Percentage or Proportion	Standard Error
March CPS Estimate, Based on Annual Income in the Prior Calendar Year	42.6 %		42.5 %		42.5 %	
SIPP Estimates						
SIPP Annual Income Estimate (Emulating March CPS Estimate)	41.7 %	1.4	41.8 %	0.6	41.8 %	0.5
Average of 12 Monthly Estimates	43.8 %	0.9	41.5 %	0.5	42.0 %	0.4
Income Eligible in Any Month ^{a,b}	52.1 %	0.9	52.8 %	0.5	53.8 %	0.5
Proportion of SIPP Annual Income Estimate						
Average of 12 Monthly Estimates	1.05	0.03	0.99	0.01	1.00	0.01
Income Eligible in Any Month ^{a,b}	1.25	0.04	1.26	0.01	1.29	0.01

SOURCES: CPS estimates: March 1991, 1992, 1993. SIPP estimates: first SIPP analysis database developed from the 1990 and 1991 SIPP full-panel files. The files include data for each calendar year and the subsequent March for the subsample of persons who were present in all 13 months and who have full data on income of the March family in the prior calendar year.

NOTE: See Appendix C for detailed results by year, for monthly estimates, and for the standard errors of the differences between the estimates. Appendix D discusses how standard error estimates account for correlations among the observations.

^aAnnual income constrained to be less than 300 percent of the poverty level using WIC poverty guidelines. Appendix C presents estimates using alternative annual income caps.

^bResults for ages 0 to 4 combined are larger than for either infants or children separately because of infants who become one-year-olds during the year. Their period as an infant is used in the infant calculation, their period as a one-year-old is used in the child calculation, and the full year is used in the combined calculation. Those who were ineligible as infants but eligible as children (or vice versa) all count as eligible in the combined calculation.

are not statistically significant.⁸ For infants, the average of the monthly estimates is 43.8 percent, while the annual income estimate is 41.7 percent. For children between ages 1 and 4, the average of the monthly estimates is 41.5 percent, and the annual income estimate is 41.8 percent. These results suggest that the percentage of infants and young children living in families with incomes below the WIC eligibility threshold *in an average month* is about the same as the percentage with *annual income* below the threshold.

However, as previously noted, the sample for this analysis is limited to infants and children for whom an annual family income measure similar to the March CPS measure could be constructed. These infants and children may live in more stable families than the full sample of children and, thus, potentially have higher incomes in a typical month. Using the largest possible sample in each month (from the unlinked core files) to calculate average monthly eligibility rates provides a way to test the sensitivity of the results to the sample restrictions. Table III.2 compares average monthly income-eligibility rates estimated from the unlinked core files, for the years 1990 to 1992 and the 3 years pooled, to the corresponding estimates from the analysis file. The estimated eligibility rates are essentially the same for infants, but the unlinked core files suggest slightly higher monthly rates for children ages 1 to 4. On average over the 3 years, the rate of WIC eligibility is a statistically significant 1.7 percentage points higher as estimated from the core files (43.2 percent) than as estimated from the analysis files (41.5 percent). However, SIPP annual income estimates for the broader wave file samples are not available, and could also be larger. Furthermore, the CPS annual income estimate for children ages 1 to 4 is between the two monthly estimates (42.5 percent; see Table III.1). Even if the annual income estimate were the same for the broader sample, the differences between the annual and monthly estimates are small, and less than had been expected from the review of the poverty literature.

Although eligibility rates based on monthly and annual income are similar, this does not necessarily mean that the *same* families fall below the eligibility threshold from one month to the next. If there is any month-to-month income variation, then, each month, the number of infants and children in families with annual incomes above the WIC eligibility threshold who are below this month must be roughly balanced by the number with annual incomes below the threshold who are above this month. This is the case, as discussed below, in examining characteristics of children eligible over various periods.

⁸Table C.4 presents these comparisons in more detail, including the differences between the estimates and their standard errors.

TABLE III.2

ESTIMATES OF AVERAGE MONTHLY WIC INCOME ELIGIBILITY RATES FROM ALTERNATIVE SIPP FILES,
BY YEAR AND AGE OF CHILD

	First Analysis Database (A)	Unlinked Core Files (B)	Difference (A - B)		
	Estimate	Estimate	Estimate	Standard Error	t-statistic
1990					
Infants	43.9%	43.1%	0.8%	1.0%	0.84
Children	39.5	41.6	-2.0	0.5	-3.88 **
All	40.3	41.9	-1.6	0.5	-3.24 **
1991					
Infants	43.7	45.1	-1.4	0.7	-1.97 *
Children	42.1	43.8	-1.7	0.4	-4.35 **
All	42.4	44.1	-1.7	0.4	-4.59 **
1992					
Infants	44.2	44.2	0.0	1.3	0.00
Children	43.4	44.0	-0.7	0.7	-0.89
All	43.5	44.1	-0.5	0.7	-0.75
1990-1992					
Infants	43.8	44.2	-0.4	0.6	-0.65
Children	41.5	43.2	-1.7	0.3	-5.86 **
All	42.0 %	43.4 %	-1.5 %	0.3 %	-5.56 **

SOURCES: Column 1: first SIPP analysis database developed from the 1990 and 1991 SIPP full-panel files. The files include data for each calendar year and the subsequent March for the subsample of persons who were present in all 13 months and who have full data on income of the March family in the prior calendar year. Column 2: unlinked files from the 1990 and 1991 SIPP panels. All children with data for each calendar month were used, and estimates are weighted by the monthly SIPP weights.

NOTE: Standard errors of the differences were calculated using software that fully accounts for the correlations among observations. See Appendix D.

*Significantly different from zero at the .05 level, two-tailed test.

**Significantly different from zero at the .01 level, two-tailed test.

Estimates of the Percentage of Infants and Children Ever Income Eligible for WIC During a Calendar Year

As noted, WIC income eligibility is generally determined on the basis of monthly income, but recertification only takes place every 6 to 12 months. By counting all of those who ever dropped below the eligibility threshold over the course of a year, an upper-bound estimate is obtained of those who could have been certified as income eligible for WIC.

More than 50 percent of infants and children live in families that had at least 1 month of income eligibility during the past year (Table III.1).⁹ Looking at these estimates from another perspective, about 25 to 30 percent more children live in families that experienced at least 1 month of WIC income eligibility over the course of a year than live in such families in any given month (last line of Table III.1).¹⁰ This means that the pool of children who could be receiving WIC benefits at a point in time could be as much as 1.3 times larger than the number below the income-eligibility threshold in that month.

Comparison with Previous Literature

The findings just discussed suggest less volatility in monthly income among the families of young children than the studies of the dynamics of poverty reviewed in Appendix A had suggested. For example, Table III.1 indicates that the proportion of children eligible for WIC in at least 1 month over the course of a year is about 25 to 30 percent larger than the proportion eligible on an annual basis. The poverty studies cited in Appendix A showed that the proportion of persons in poverty in at least 1 month of the year is about twice as large as the proportion who are poor on an annual basis (see Table A.3). The differences from the poverty literature could be the result of at least two factors. First, young children may be in families with more stable incomes than the population in general. Second, there may be greater income stability

⁹These estimates are based on less than 12 months for most infants and many children, since only months when they were in the appropriate age group are counted; thus, the proportion of children whose family's income fell below the eligibility threshold during the past year may be understated.

¹⁰The estimate provided in the text counts as eligible only families with annual incomes below three times the poverty level; Appendix C provides alternative results for lower cutoffs. The first section of this chapter contains a discussion of why an annual income cutoff is used.

around the WIC eligibility threshold (which is 185 percent of the poverty line) than around the much lower poverty threshold.¹¹

Results presented in Tables III.3 and III.4 indicate that both factors are at work. Table III.3 provides estimates of the percentage of infants, young children, and all persons with incomes less than 185 percent of the poverty level in 1991. Table III.4 provides estimates of the percentage of infants, young children, and all persons with incomes less than 100 percent of the poverty threshold in 1991. Using either income threshold, the proportionate difference between the estimate based on annual income and the estimate of those with at least 1 month of eligibility during the year is substantially greater for the population as a whole than it is for either infants or for young children. For example, Table III.3 (last line) shows that infants are 26 percent more likely to be WIC income eligible in at least 1 month of the year than on an annual basis, while people in general are 40 percent more likely to be income eligible in at least 1 month of the year. Table III.4 shows that infants are 40 percent more likely to be poor in at least 1 month than on an annual basis, while people in general are 81 percent more likely to be poor in at least 1 month. This indicates that young children are less likely than the population as a whole to live in families with month-to-month variability around either of these two thresholds. Children are poorer than the population in general and, thus, more likely to be consistently poor.

The estimates in Table III.4 as compared to Table III.3 indicate that the disparity between the annual and monthly estimates of those below the threshold is greater around the poverty line than around the higher WIC threshold. For example, although only 26 percent more infants are WIC eligible in at least 1 month than on an annual basis, fully 40 percent more infants are poor in at least 1 month than on an annual basis. Because the poverty threshold is lower than the WIC threshold, there are more families who drop below the threshold only some of the time relative to those who stay below consistently.

¹¹A third possibility is that low-income individuals may have had more stable incomes in the early 1990s than in the period the earlier analyses covered (1984-1985). Comparison of the last column of Table III.4 with Table A.3 provides some support for this hypothesis, but the differences are not large enough to be conclusive.

TABLE III.3

ALTERNATIVE ESTIMATES OF PERCENTAGE OF INFANTS, YOUNG CHILDREN, AND ALL PERSONS
WITH INCOME BELOW THE WIC ELIGIBILITY THRESHOLD
(Calendar Year 1991)

	Infants (Less than 1 Year Old)		Young Children (Ages 1 to 4)		All Persons	
	Percentage or Proportion	Standard Error	Percentage or Proportion	Standard Error	Percentage or Proportion	Standard Error
SIPP Estimates						
SIPP Annual Income Estimate (Emulating March CPS Estimate)	41.4 %	2.0	41.6 %	0.8	27.7 %	0.2
Average of 12 Monthly Estimates	43.5 %	1.2	42.0 %	0.7	28.8 %	0.2
Income Eligible in Any Month*	52.1 %	1.2	53.0 %	0.7	38.9 %	0.2
Proportion of SIPP Annual Income Estimate						
Average of 12 Monthly Estimates	1.05	0.05	1.01	0.01	1.04	0.00
Income Eligible in Any Month*	1.26	0.05	1.27	0.02	1.40	0.01

SOURCES: First SIPP analysis database developed from the 1990 and 1991 SIPP full-panel files. The files include data for each calendar year and the subsequent March for the subsample of persons who were present in all 13 months and who have full data on income of the March family in the prior calendar year.

* Annual income constrained to be less than 300 percent of the poverty level using WIC poverty guidelines. Appendix C presents estimates using alternative annual income caps.

TABLE III.4

ALTERNATIVE ESTIMATES OF PERCENTAGE OF INFANTS, YOUNG CHILDREN, AND ALL PERSONS
WITH INCOME BELOW 100 PERCENT OF THE DHHS POVERTY GUIDELINE
(Calendar Year 1991)

	Infants (Less than 1 Year Old)		Young Children (Ages 1 to 4)		All Persons	
	Percentage or Proportion	Standard Error	Percentage or Proportion	Standard Error	Percentage or Proportion	Standard Error
SIPP Estimates						
SIPP Annual Income Estimate (Emulating March CPS Estimate)	23.4 %	1.7	22.2 %	0.7	11.7 %	0.1
Average of 12 Monthly Estimates	24.9 %	1.1	22.5 %	0.6	12.7 %	0.1
Poor in Any Month ^a	32.8 %	1.2	32.7 %	0.7	21.2 %	0.2
Proportion of SIPP Annual Income Estimate						
Average of 12 Monthly Estimates	1.06	0.07	1.01	0.02	1.09	0.01
Poor in Any Month ^a	1.40	0.09	1.47	0.04	1.81	0.02

SOURCES: First SIPP analysis database developed from the 1990 and 1991 SIPP full-panel files. The files include data for each calendar year and the subsequent March for the subsample of persons who were present in all 13 months and who have full data on income of the March family in the prior calendar year.

^a Annual income constrained to be less than 300 percent of the poverty level using WIC poverty guidelines. Appendix C presents estimates using alternative annual income caps.

**Characteristics of
Children Income
Eligible Over Various
Periods**

To clarify the relationship between the measures of income eligibility for WIC, the distribution of infants and children across four eligibility groups was assessed. The four groups are:

1. Income eligible on an annual basis and in every month
2. Income eligible on an annual basis but not in every month
3. Not income eligible on an annual basis but eligible in at least 1 month
4. Not income eligible on an annual basis or in any month

These groups are referred to as Groups 1 to 4, for brevity. To explore the characteristics of children in these four groups and their mothers, data on the income, program participation, and other characteristics of the children's mothers was merged with the records of their children. Income eligibility estimates in this section are based on income data from the mother's record and, thus, are not directly comparable to those in previous sections. In particular, for infants, data on income for the mother refers to the entire previous year, including some period before the infant was born. This section focuses on patterns of income eligibility among these four groups; Chapter V considers patterns of program participation. Appendix F presents further details on the files used in this analysis, as well as additional tabulations of the characteristics of the four groups.

Patterns of Income Eligibility. Table III. 5 shows the distribution of children across the four groups for infants, children ages 1 to 4, and all children under age 5. Just over one-quarter of all children under age 5 (26 percent) are always WIC eligible, from 16 to 17 percent are in each of the middle two

TABLE III.5
INCOME ELIGIBILITY PATTERNS OF FAMILIES, BY AGE OF CHILD
(ROW PERCENTAGES)

	Annually Eligible and Eligible for WIC In		Not Annually Eligible and Eligible for WIC In		Unweighted Sample Size
	All Months	Some Months	Some Months	No Months	
All Children Under Age 5	25.6 %	16.4 %	16.7 %	41.3 %	11,098
Infants	21.7 %	19.3 %	15.4 %	43.6 %	1,948
Children Ages 1 to 4	26.5 %	15.7 %	17.0 %	40.9 %	9,150

SOURCE: Weighted estimates from the first analysis database created from the 1990 and 1991 SIPP panels.

NOTE: Data for calendar years 1990 to 1992 are pooled. Estimates of monthly and annual income eligibility were estimated using the family income from the mother's record. The primary way this differs from using the child's income is that monthly income eligibility estimates may include months before the child's birth. See Appendix F for additional discussion.

groups, and 41 percent are never eligible for WIC. The patterns for infants and older children are similar.¹²

Table III.6 shows how these four groups differ in their mean and median incomes, the number of months they qualify for WIC, and their rates of income eligibility for WIC in each month. As the percent of time eligible for WIC falls, mean and median incomes increase.¹³ Those in Group 1, who are always eligible for WIC, have both mean and median incomes below the poverty line. Group 2 children are eligible for WIC annually and for 8 months on average; about two-thirds are eligible in any given month, and their median annual incomes are 150 percent of poverty, still well below the WIC threshold. Group 3 children are eligible for WIC for just over 3 months on average, but are not annually eligible, and their family's median annual incomes are 231 percent of poverty. Finally, Group 4 children, who are never eligible for WIC, live in families with median incomes of nearly four times the poverty level.

Tables III.5 and III.6 together show how monthly and annual eligibility rates can be very close, despite the substantial numbers who move in and out of being eligible based on monthly income. In any given month, about two-thirds of those in Group 2 are annually eligible and eligible in that month, but about one-third are not eligible in that month (see the monthly eligibility rates in Table III.6). However, about one-third of those in Group 3 are eligible in each month, but not annually. Because Groups 2 and 3 are roughly equal in size (Table III.5), the number eligible each month is roughly equal to the number annually eligible.

¹²Despite the use of the mother's income, the results are consistent with the previous analyses. For example, 42 percent of children are annually eligible, as would be expected since the calculations should be the same for the mother and child. Although 60 percent are eligible in some month of the year, which is higher than the figure in Table III.1, this is both because no annual income cap is used and because using the additional months of income puts a few more children in the ever eligible category.

¹³Appendix F shows that other family characteristics, such as education and employment of the mothers, follow patterns consistent with this ascending hierarchy of economic well-being.

TABLE III.6

INCOME AND INCOME ELIGIBILITY PATTERNS, BY WIC ELIGIBILITY GROUP
(POOLED DATA FOR 1990 TO 1992 FOR ALL CHILDREN UNDER AGE 5)

	Full Sample	Annually Eligible and Eligible in		Not Annually Eligible and Eligible in	
		All Months	Some Months	Some Months	No Months
Median Annual Income/Poverty Ratio	2.19	0.66	1.50	2.31	3.81
Mean Annual Income/Poverty Ratio	2.62	0.71	1.38	2.64	4.29
Mean Number of Months Eligible for WIC	5.0	12.0	8.1	3.3	0.0
Income Eligible for WIC in					
January	38.9 %	100.0 %	54.3 %	26.4 %	0.0 %
February	42.3	100.0	69.3	32.3	0.0
March	40.0	100.0	61.7	25.8	0.0
April	40.0	100.0	64.7	22.7	0.0
May	38.2	100.0	57.9	18.7	0.0
June	40.4	100.0	64.6	25.2	0.0
July	42.0	100.0	69.2	30.4	0.0
August	41.6	100.0	69.7	27.4	0.0
September	43.0	100.0	76.8	28.6	0.0
October	41.8	100.0	73.6	24.9	0.0
November	43.1	100.0	75.1	31.4	0.0
December	44.1	100.0	76.3	36.0	0.0
Sample Size (unweighted)	11,098	2,730	1,712	1,869	4,787

SOURCE: Weighted estimates from the first analysis database created from the 1990 and 1991 SIPP panels.

NOTE: Annual and monthly income eligibility were estimated using the family income from the mother's record. See Appendix F for additional details.

**WIC
PARTICIPATION
RATES FOR
INFANTS AND
CHILDREN**

Estimates that compare the number of WIC participants from administrative data to the number of eligible individuals from the CPS sometimes have indicated a participation rate for infants in excess of 100 percent. This discrepancy was thought to reflect underreporting of income eligibility in the CPS. One potential source of an underestimate was the use of an annual accounting period in the CPS estimate but the use of short-term (typically monthly) income in program administration. However, as shown in the previous section, estimates of eligibility from the SIPP based on monthly income and annual income are very close to each other and to the CPS estimate. This suggests that participation rates that use eligibility estimates based on monthly income probably will not differ from those based on annual income, except for sampling error.

This section presents:

- Estimates of the number of income eligible infants and children from SIPP and the CPS
- Estimates of the number of WIC participants from FCS administrative records
- Participation rates based on combinations of the above estimates

All estimates in this section are for calendar year 1992, the most recent year these data cover.

**Estimates of the
Number of Infants
and Children Income
Eligible for WIC**

Table III.7 presents three estimates of the number of infants and children income eligible for WIC in 1992. They are:

1. March 1993 CPS annual income estimates for 1992
2. SIPP annual income estimates for 1992 (from the 1991 panel), using CPS methods
3. SIPP estimates of average monthly eligibility in 1992 (from the 1991 panel)

TABLE III.7

ALTERNATIVE ESTIMATES OF NUMBER OF INFANTS AND
CHILDREN INCOME ELIGIBLE FOR WIC IN 1992

(Standard Errors in Parentheses)

Participant Category	March 1993 CPS	1991 SIPP Panel: Annual Income Estimate for 1992 ^a	1991 SIPP Panel: Average Monthly Estimates for 1992
Infants	1,717,743 (61,939)	1,357,408 (205,128)	1,649,199 (209,551)
Children	6,925,815 (122,618)	7,113,488 (463,905)	7,075,566 (429,095)
Infants and Children	8,643,558 (136,331)	8,470,896 (504,764)	8,724,765 (474,802)

SOURCES: March 1993 CPS; first analysis database created from the 1990 and 1991 SIPP panels.

^aUsing methods that emulate the March CPS estimate.

These estimates were computed using methods described earlier.

When CPS methods (an annual accounting period and fixed family composition) are used, SIPP provides a point estimate for the number of infants income eligible for WIC that is lower than the CPS point estimate (1.4 million, versus 1.7 million) and a point estimate for the number of children that is close to the CPS estimate (7.1 million, versus 6.9 million).¹⁴ In both cases, however, the standard error for the SIPP estimate is so large that it is not significantly different from the CPS estimate.¹⁵

SIPP estimates of income-eligible infants and children based on averages of monthly estimates are remarkably close to (and not significantly different from) the CPS estimates.

Estimates of WIC Participants

FCS administrative data indicate that there were 1,647,553 infants and 2,496,374 children participating in WIC in an average month in 1992. Because the administrative numbers are based on states reporting to FCS on the number of food instruments issued, they have no sampling error associated with them. The numbers used here are an average of the 12 monthly participation counts. Participants in U.S. territories were excluded, since they are not included in the SIPP universe.

¹⁴The low estimate for infants reflects a small overall sample of infants in the file in March 1993. This may reflect attrition in SIPP. Infants in March 1993 were assigned weights on the basis of their mothers' 1992 weights. These weights, therefore, only represent infants born to mothers present in January 1992 and remaining in the SIPP sample through March 1993. Previous tables did not use infants born in January through March of 1993; however, these infants were used in computing the estimates of eligibles based on annual income shown in this table.

¹⁵The standard error estimates presented in Table III.7 are calculated using a Taylor Series method and generalized variance parameters provided by the Census Bureau.

Implied WIC Participation Rates

Table III.8 presents alternative participation rate estimates for 1992 using three eligibility estimates: (1) estimates using annual income from the March 1993 CPS; (2) the SIPP eligibility estimate calculated in a manner comparable to the CPS; and (3) the SIPP estimate that is an average of 12 monthly estimates of income eligibles, which seems the most appropriate comparison with the FCS data.¹⁶

The estimates of WIC participation rates for infants and children in Table III.8 are based on the estimates of eligible infants and children presented in Table III.7. In each case, the numerator (the number of WIC participants) is the average monthly number of participants from FCS administrative data. The estimated participation rate thus varies only with the denominator, the estimate of the number of infants and/or children income eligible for WIC.¹⁷

Because estimates of the number of children income eligible for WIC were generally similar across data sources and methods, estimates of participation rates also are similar. The only exception is that the estimated participation rate for infants using the SIPP estimate of eligibles based on annual income is implausibly high--121 percent. As noted earlier, this reflects a very small SIPP sample of infants of all incomes in March 1993. However, both the CPS annual income estimate and the SIPP monthly income estimate imply a participation rate for infants of nearly 100 percent; in contrast, the participation rate for children is estimated to be 35 to 36 percent.

Standard errors for the estimated number of infants and children income eligible for WIC could be reduced by pooling data across SIPP panels and/or across years. Pooling data across panels for an estimate that applies to 1992

¹⁶FCS currently estimates participation rates based on CPS estimates of income-eligible infants and children. The CPS-based participation rate estimates presented here are not fully comparable to those published by FCS, however, primarily because FCS adjusts the estimates to reflect the estimated rate of nutritional risk among the income-eligible population.

¹⁷Standard errors are not reported for this table because confidence bounds for these numbers are not symmetrical around the point estimate. To find the confidence bounds for an estimate in this table, construct the confidence interval around the estimate from Table III.7. Confidence bounds of the participation rate can then be constructed using these upper and lower limits as the denominator and the FCS number of participants as the numerator.

TABLE III.8

1992 WIC PARTICIPATION RATES IMPLIED BY FCS PARTICIPATION COUNTS
AND ALTERNATIVE ESTIMATES OF INCOME ELIGIBILITY
(Percentages)

Participant Category	Eligibility Estimate Used in Calculating Participation Rates		
	March 1993 CPS	1991 SIPP Panel: Annual Income Estimate for 1992 ^a	1991 SIPP Panel: Average Monthly Estimates for 1992
Infants	95.9	121.4	99.9
Children	36.0	35.1	35.3
Infants and Children	47.9	48.9	47.5

NOTE: These participation rate estimates are based on the estimates of WIC eligibles in Table III.7.

^aUsing methods that emulate the March CPS estimate.

was not possible when these estimates were prepared, because the Census Bureau had not yet released the 1992 SIPP panel file. Pooling data across years and across panels would be possible, but the resulting estimate would not be an estimate for 1992; it would be a weighted average of the number of infants income eligible for WIC over the period covered. Such an estimate could be compared to a similarly weighted average number of infants participating in the program over the period to yield an average participation rate. The weights used could be chosen to minimize the standard error of the desired estimate.

The estimates reported in Table III.8 suggest that such improvements will still yield participation rates for infants of close to 100 percent. The results reported in the previous section suggest that this high apparent participation rate may be the result of the long certification period for infants. The number of infants in the pool of WIC eligibles (those income eligible at a point in time plus those who potentially could have been certified as income eligible and have not yet been scheduled for recertification) could be as much as 25 percent greater than the estimates used here (see Table III.1). An estimate counting all “ever eligible” infants would thus yield participation rates up to 20 percent lower than rates based on the number of infants with incomes below the eligibility threshold at a point in time.

SUMMARY

Previous studies have found higher levels of poverty using monthly income measures than using annual measures. On the basis of those studies, this research set out to investigate the hypothesis that estimates of WIC income eligibility based on an annual accounting period could be understating the size of the eligible population in any month and that estimates of participation rates derived from these eligibility estimates could be overstated. The findings of this study suggest a somewhat different picture. Specifically, this study found:

- The proportion of infants and children income eligible for WIC is very similar when measured with the CPS and measured with SIPP using methods that mimic the CPS estimates.
- SIPP estimates of the average monthly percentage of infants and children income eligible for WIC are close to SIPP estimates based on annual income. Because none of the SIPP estimates is ideal for comparison to the CPS, this issue was investigated using a range of methods. Using the sample for which annual income was available,

the SIPP estimates of annual and average monthly eligibility rates were not significantly different. Using the largest possible SIPP sample each month, estimates of average monthly eligibility rates for children ages 1 to 4 were slightly higher than the estimates for the restricted sample; however, it may be that annual eligibility rates for this sample would also be higher, if an annual income measure were available. Even if the annual income estimate was the same for the broader sample, the differences between the monthly and annual estimates are small and less than had been expected from the review of the poverty literature.

- Both previous research and this study find that estimates of poverty rates based on monthly income are generally higher than estimates based on annual income. The difference between the findings for poverty rates and WIC eligibility rates results in part because a higher threshold (185 percent of poverty) is used for WIC eligibility, and in part because infants and young children are in families with more stable (and lower) incomes than individuals in general.
- Although monthly and annual eligibility rates are similar, this does not imply the same individuals are eligible for WIC from month to month. In fact, 25 to 30 percent more infants and children are income eligible for WIC in *some* month of the calendar year than are income eligible on average.¹⁸ Since individuals are only recertified for WIC every 6 to 12 months, the number eligible in any month of the past year is an upper-bound estimate of those who could potentially be on WIC.
- A comparison of the characteristics of those consistently and intermittently eligible for WIC confirms that consistent eligibility is strongly associated with lower income.
 - Infants and children who are eligible for WIC in all months of the year are poor on average.

¹⁸This is a conservative estimate, as noted above, in that it includes only those with annual incomes below 300 percent of the poverty level and, for infants, income is only counted in the months after birth.

- Those who are annually eligible, but not eligible in all months, are eligible for 8 months on average and have median incomes about 150 percent of poverty.
- Those who are not annually eligible, but are eligible in some months, are eligible for about 3 months on average and have median annual incomes about 230 percent of poverty.
- Regardless of whether an annual or monthly income eligibility estimate was used, the estimated participation rate for infants was close to 100 percent. The estimated participation rate for children was 35 to 36 percent.

FCS had been concerned that the use of an annual, instead of a monthly, measure of income eligibility was the reason that estimates of participation rates for infants were at or near 100 percent, but the findings just described imply this result is not due to use of an annual income measure. Instead, the length of the certification period for infants, coupled with income changes during that period, is likely to explain much of the high estimated participation rate for infants.