

Estimating  
Eligibility  
and  
Participation  
for the  
WIC Program  
Phase I Report

NATIONAL RESEARCH COUNCIL

# Estimating Eligibility and Participation for the WIC Program

Phase I Report

Panel to Evaluate the USDA's Methodology for Estimating  
Eligibility and Participation for the WIC Program

Michele Ver Ploeg and David M. Betson, Editors

Committee on National Statistics

Division of Behavioral and Social Sciences and Education

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In the preparation of this report, the panel convened two meetings. The initial open meeting of the panel was held on December 8, 2000. At this meeting, informative and helpful presentations on the regulations and operation of the WIC program were provided by Cindy Long and Debbie Whitford of FNS; Anne Gordon of Mathematica Policy Research, Inc. (MPR); and Robert Greenstein and Leighton Ku of the Center for Budget Priorities and Policy.



The second open meeting of the panel was convened on March 15-16, 2001, for the purpose of gathering background information relevant to the estimation of eligibility and participation in the WIC program. The panel wishes to acknowledge the presentation at the workshop by Gregory Spencer of the Census Bureau; Booker Smith of Ross Laboratories; Marie Louise Harrell of Sigma One Corporation; Carole Trippe and Allen Schirm of MPR Inc.; Jenny Kenney and Lisa Dubay of the Urban Institute; Michael Brien of the University of Virginia; and Julie Kresge of FNS. The panel also greatly appreciated the panel discussion of four state WIC directors: Phyllis Bramson-Paul of California; Alice Lenihan of North Carolina; Frank Maisano of Pennsylvania; and Peggy Trouba of Nebraska.

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The panel was assisted by a very able staff. The work of the panel could not have been completed without the assistance of Michele Ver Ploeg, the study director. Shelly's preparations of the various drafts of the report and attention to the overall project contributed to the timely completion of the report. Also we would like to thank Constance Citro, senior program officer at the National Research Council for her advice and counsel during this first phase of the panel's work. Finally, the panel acknowledges the able project and research assistance provided by Jamie Casey, Marisa Gerstein, and Michael Siri.

This report has been reviewed in draft form by individuals chosen for their diverse perspectives and technical expertise, in accordance with procedures approved by the National Research Council's (NRC) Report Review Committee. The purpose of this independent review is to provide candid and critical comments that will assist the institution in making its published report as sound as possible and to ensure that the report meets institutional standards for objectivity, evidence, and responsiveness to the study charge. The review comments and draft manuscript remain confidential to protect the integrity of the deliberative process. We wish to thank the following individuals for their review of this report: Michael J. Brien, Department of Economics, University of Virginia; Mary Kay Fox, Abt Associates, Cambridge, MA; Hermann Habermann, Statistics Division,

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Although the reviewers listed above have provided many constructive comments and suggestions, they were not asked to endorse the conclusions or recommendations, nor did they see the final draft of the report before its release. The review of this report was overseen by Robert Moffitt, Department of Economics, Johns Hopkins University. Appointed by the National Research Council, he was responsible for making certain that an independent examination of this report was carried out in accordance with institutional procedures and that all review comments were carefully considered. Responsibility for the final content of this report rests entirely with the authoring committee and the institution.

David M. Betson, *Chair*  
Panel to Evaluate the USDA's Methodology  
for Estimating Eligibility and Participation  
for the WIC Program



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# Executive Summary

Each year the U.S. Department of Agriculture (USDA) must estimate the number of people who are eligible to participate in the Special Supplemental Nutrition Program for Women, Infants, and Children (WIC). This federal grant program to states provides benefits and services to pregnant and postpartum women, infants, and young children who meet income criteria for eligibility or who are enrolled in other federal public assistance programs (called adjunctive eligibility) and who are considered nutritionally at risk. USDA also must estimate the number of people who would participate if the program is fully funded—that is, if there are sufficient funds to serve all who are eligible and wish to participate. These estimates serve as a basis for making budget requests for the program for the upcoming year. The WIC budget for fiscal year 2000 was just over \$4 billion, and 7.2 million people participated in the program. Since WIC is not an entitlement program—that is, eligible people can enroll in the program only to the extent that funds are available—underestimating the number of people eligible and likely to participate in WIC may result in a shortfall of funds to serve them. But overestimating the number of people eligible and likely to participate in WIC may unnecessarily limit appropriations to other important programs.

These USDA estimates have come under critical scrutiny in part because the number of infants and postpartum women who have actually enrolled in the program has exceeded the number estimated to be eligible

by as much as 20 to 30 percent. These high “coverage rates” have led some members of Congress to conclude that some people who participate are truly ineligible, and that funding could be reduced somewhat and still meet the needs of truly eligible persons who wish to participate. But some advocates and state WIC agencies believe that the estimates of the number of eligible persons are too low and more people who are eligible and want to participate could do so.

In response to these concerns, the Food and Nutrition Service (FNS) of the USDA asked the Committee on National Statistics of the National Research Council to convene a panel of experts to review the methods used to estimate the number of people nationwide who are eligible and likely to participate in the WIC program. The panel’s charge is to review currently used and alternative data and methods for estimating income eligibility, adjunctive eligibility from participation in other public assistance programs, nutritional risk, and participation if the program is fully funded.

The study has two phases. In this first phase, the panel is to assess the current methodology for making eligibility and participation estimates and, if possible, to recommend improvements to the methodology. In the second phase, the panel will examine alternative methods and data sources for estimates, consider improvements in data that could affect the estimates, and explore selected topics in more detail.

The principal finding of the panel’s initial work is that the current methodology and assumptions employed by FNS substantially understate the number of people who are income eligible for WIC.

## **CURRENT METHODOLOGY**

To be fully eligible for WIC, a person must meet categorical, income, and nutritional risk criteria. Infants age 0 through 12 months, children age 1 through 4 years, pregnant women, nonbreastfeeding women less than 6 months postpartum, and breastfeeding women up to 1 year postpartum are categorically eligible for WIC. To be considered income eligible for WIC, applicants must have incomes at or below 185 percent of federal poverty guidelines, or they must be enrolled in Medicaid, the Food Stamp Program, or Temporary Assistance for Needy Families (TANF)—meaning they are adjunctively income eligible for WIC. Finally, to be fully eligible, an applicant must meet nutritional risk criteria as assessed by a competent professional authority. For example, if an applicant is underweight, is

anemic, has inappropriate dietary patterns, or has predisposing factors, he or she would be considered nutritionally at risk.

The current FNS estimation methodology uses the March Income Supplement of the Current Population Survey (CPS) to estimate the number of infants and children who live in families with annual incomes below 185 percent of the poverty guidelines. The numbers of income eligible pregnant and postpartum women are inferred from estimates of the number of income eligible infants. To obtain estimates of the number of fully eligible persons, estimates of the numbers of eligible people in each category are adjusted to account for the percentage who are also at nutritional risk.

Critics of this methodology focus on the failure of the procedure to reflect fully the current eligibility rules and regulations. The current method only partially accounts for those who are adjunctively eligible for WIC based on their enrollment in the Medicaid, Food Stamp, or TANF programs. The current method considers all persons eligible for a full year, even though children and postpartum women are certified for 6-month periods. Not accounting for these two rules could result in biases in estimates of income eligible persons.

Some income eligibility concepts are not easily defined when determining whether an applicant is income eligible. Difficulties in defining whose income counts (i.e., who is part of the family, or “economic unit”) and the accounting period for income (monthly versus annual) can result in variability in how eligibility definitions are applied in local WIC offices. Failure to account for this variability that results from the flexibility local WIC offices have in applying eligibility definitions presents the potential for errors in the estimation of the number of people eligible for WIC.

Given the short time period for the first phase of the study, the panel chose to focus on the following estimation issues that were thought to have the largest overall impact on the number of people eligible for WIC:

1. the accuracy of the CPS in counting all infants and children;
2. adjunctive eligibility through the TANF, Food Stamp, and Medicaid programs;
3. use of monthly income versus annual income to determine income eligibility;
4. adjustment for 6-month certification periods;
5. alternative definitions of the economic unit;
6. the number of individuals who are at nutritional risk among those who are income eligible for WIC.



The first five areas pertain to the estimation of the number of income eligible persons—those individuals who are categorically eligible and meet the income criteria for the program. The sixth issue is the extent to which individuals are fully eligible for WIC—that is, both income eligible and at nutritional risk.

In addition to these six issues for estimating eligibility, the panel also examined current methods for estimating the proportion of fully eligible persons who would participate in WIC under full funding.

## CONCLUSIONS AND RECOMMENDATIONS

### Income Eligibility

#### *Accuracy of the CPS in Its Representation of All Infants and Children in the Population*

The current weighting scheme employed by the CPS underrepresents the number of infants by roughly 2 percent but overrepresents the number of children by 0.6 percent. This underrepresentation results from the way the CPS sample estimates for nonwhite children are controlled to population totals. Underrepresentation of the total number of infants implies an understatement of the estimated number of infants and women who are eligible for WIC.

#### *Adjunctive Eligibility*

Many people are adjunctively eligible for WIC through their enrollment in other transfer programs, especially Medicaid, which has higher income eligibility thresholds in some states than WIC does. Since current methods make only a very minor adjustment for those adjunctively eligible, the number of eligible persons is understated. Taking a conservative approach of counting only those who are enrolled in these programs as adjunctively eligible, the panel's estimates show that the number of eligible infants increases by 45 percent and the number of eligible children increases by 21 percent compared with estimations using current methods.

**Conclusion: Not fully accounting for adjunctive eligibility results in a substantial underestimation of the number of people eligible for WIC.**

In addition to these estimates that use a conservative approach to estimating the number of participants who are adjunctively eligible for WIC due to their participation in Medicaid, the panel considered two alternative estimates: (1) the number of people eligible for Medicaid, and (2) the number of people eligible for Medicaid but without private health insurance. During Phase II of the panel's work, each of these alternatives will be further scrutinized.

### *Monthly Versus Annual Income*

Family income can vary considerably over the course of a year. As a result, some families may appear to be income eligible for WIC when monthly income is used to estimate income eligibility, but not if annual income is used. Estimates developed by the panel show that the current method of using annual income to estimate eligibility results in an understatement of the number of infants and children eligible for WIC compared with estimates using monthly income. After accounting for adjunctive eligibility the panel estimates that the use of monthly income increases the estimated number of eligible infants and children by 4 percent and by 9 percent, respectively.

### *Certification Period for Children*

Children and postpartum women are certified as eligible for WIC for 6-month periods, but current methods for estimating eligibility consider them eligible for an entire year. The panel estimated the number of children who would be income eligible for WIC if an adjustment for this 6-month certification was made. Making this adjustment decreases the number of children eligible for WIC by 5 percent, after accounting for adjunctive eligibility and using monthly income. However, it is 4 percent higher than the estimate that employs annual income and accounts for adjunctive eligibility.

### *Alternative Definitions of the Economic Unit*

The panel explored variability in the estimated number of eligible infants and children using different definitions of the economic unit. Using a restrictive definition, which counts an economic unit as income eligible only if it meets income eligibility requirements under *both* a narrow and a

broad definition of an economic unit, the estimated number of income eligible infants decreases by 0.2 percent and the estimated number of income eligible children decreases by 0.3 percent. However, if one uses a more generous definition, which counts a family as income eligible if it meets income eligibility requirements under *either* a narrow or a broad definition of the family, then the estimated number of income eligible infants increases by 1 percent and increases by 1.5 percent for children.

### Nutritional Risk

The panel examined recent estimates of the prevalence of nutritional risk for estimating the percentage of income eligible persons who are fully eligible. Current methods for estimating the number of income eligible persons who are at nutritional risk are based on old data. More recent estimates of the prevalence of nutritional risk have been produced, but the data used for these estimates are also old, and do not reflect recent standardization of nutritional risk criteria across states. The panel has concerns about the methods used to make these estimates. Consequently, the estimates of nutritional risk currently used may not accurately reflect the actual number at nutritional risk.

**Recommendation: Estimates of nutritional risk should be reexamined with more recent data and with additional data sources and should take new state standards of nutritional risk into account whenever possible.**

### Full Eligibility

Considering all of these eligibility estimation issues and the size of their effects on the eligibility estimates as a whole, it is apparent that current methods underestimate the number of people who are eligible for WIC.

**Conclusion: The panel concludes that current methods used to estimate eligibility for WIC substantially underestimate the number of people who are eligible.**

The underestimation of eligibility implies that coverage rates are overstated. On the basis of simulation results prepared by the panel, the number

of infants estimated to be eligible for WIC is underestimated by a total of 54 percent (considering the undercount of infants in the CPS, adjunctive eligibility, and the use of monthly instead of annual income). If the 1999 coverage rate of 130.4 percent based on current USDA methods is recalculated using the panel's higher estimate of eligible infants, the coverage rate falls to 84.7 percent. Presumably the coverage rates of pregnant and postpartum women would fall similarly. For children, the total underestimation of those eligible is 25 percent (considering an overcount of children in the CPS, adjunctive eligibility, the use of monthly instead of annual income, and a 6-month certification period). The 1999 coverage rate for children was 76.0 percent based on current USDA methods. If this rate is recalculated with the larger estimate of eligible children, it falls to 60.8 percent. Thus, coverage rates based on the panel's estimates of eligibility would fall considerably if these estimates pass further scrutiny.

It is important to note that although the panel concludes that the estimated number of those eligible is understated and coverage rates are subsequently overstated, it is still possible that ineligible persons are participating in WIC.

### **Estimating Full-Funding Participation**

Past practice in estimating participation has assumed that participation rates for WIC would mirror participation rates for the Food Stamp Program for children age 0 to 4 years. Until recently, participation rates for this program from the late 1980s were used as a basis for adjusting the eligibility estimates, meaning that roughly 80 percent of those eligible were estimated to participate.

Assuming that WIC participation rates will be similar to those of the Food Stamp Program is problematic because the two programs are very different in terms of their eligibility rules, benefit levels, purposes, and possible stigmas. These differences are likely to have differential effects on an individual's decision to participate.

**Conclusion: Use of food stamp participation rates as a proxy for WIC participation rates is inappropriate because the program rules and goals, populations targeted, benefits provided, and public stigmas of these programs are sufficiently different that participation decisions for the program are also likely to be quite different.**

**Recommendation:** The panel recommends that alternative methods for estimating WIC participation rates be examined. In addition, further research concerning factors that influence the decision to apply for and participate in WIC should be conducted.

The panel has not had time in this first phase of the study to fully consider alternative methods for estimating participation rates, but it does propose a short-term alternative in the interim. The method multiplies lagged WIC participation rates from the latest year available by estimates of eligibility for the prediction year to compute an estimate of participation for the prediction year. The panel's future work will explore the appropriateness of this method and other methods more fully.

#### **METHODOLOGICAL ISSUES FOR FURTHER CONSIDERATION IN PHASE II OF THE STUDY**

The second phase of the panel's work will focus on alternative estimation methods to reduce the substantial systematic biases present in the current estimates of eligibility. Methods for estimating the number of people who are adjunctively eligible for WIC will be a priority in Phase II. Other eligibility topics the panel will further investigate include use of the Survey of Income and Program Participation (SIPP) or other data alternatives or supplements to the CPS; estimating eligibility in the U.S. territories (American Samoa, Guam, Puerto Rico, and the American Virgin Islands), methods for estimating the number of eligible pregnant women; methods for estimating breastfeeding rates in order to estimate the number of eligible postpartum women; and methods and data for estimating the prevalence of nutritional risk. In addition, the general precision of the eligibility estimates will be explored. Finally, Phase II will examine alternative methods to estimate the number of eligible people who are likely to participate in WIC if the program is fully funded.

## Introduction

The Special Supplemental Nutrition Program for Women, Infants, and Children (WIC) is a federal grant program to states to provide food and nutrition education benefits and referral services to pregnant and postpartum women, infants, and young children who meet income eligibility criteria or who are enrolled in other federal public assistance programs (adjunct eligibility) and who are considered nutritionally at risk. Each year the United States Department of Agriculture (USDA) estimates the number of people who are eligible for WIC and the number of people who are expected to participate in the program if it is fully funded. These estimates serve as a basis for making budget requests for the program for the upcoming year. The WIC budget for fiscal year (FY) 2000 was just over \$4 billion, and 7.2 million people participated in the program. Since WIC is not an entitlement program—that is, eligible people can be enrolled in the program only to the extent that funds are appropriated—underestimating the number of people eligible and likely to participate in WIC may result in a shortfall of funds to serve them. But overestimating the number of people eligible and likely to participate in WIC may result in other important programs not receiving sufficient appropriations.

The USDA estimates of the number of participants have come under critical scrutiny in part because the number of infants and postpartum women who actually enrolled in the program has exceeded the number estimated to be eligible by as much as 20 to 30 percent in recent years. These high “coverage rates” have led some members of Congress to con-

clude that some participants are truly ineligible, and that funding could be reduced somewhat and still meet the needs of truly eligible people who would participate under full funding (see U.S. House of Representatives, 1998). In contrast, some advocates and state WIC agencies believe that the estimates of the number of eligible persons are too low and that there are additional people who are eligible and want to participate.

### PANEL CHARGE AND APPROACH

In response to these concerns, the Food and Nutrition Service (FNS) of the USDA asked the Committee on National Statistics of the National Research Council to convene a panel of experts to review the methods used to estimate the national number of people eligible for WIC and the assumptions underlying estimates of the national number of people likely to participate if enough funds are allocated to serve all who wish to participate, that is, if the program is fully funded. The panel is charged with reviewing data and methods for estimating income eligibility, adjunctive eligibility from participation in other public assistance programs, nutritional risk, and for estimating participation if the program is fully funded. The panel was also asked to consider alternative methods and data for making these estimations.

The study includes two phases. In the first phase, the panel was asked to provide preliminary feedback to FNS by reviewing the current methodology for making eligibility and participation estimates and the relevant literature on these estimations, assessing the methodology, and potentially recommending improvements to the methodology. The first phase began when the panel was formed in November 2000. Since its formation the panel has hosted two meetings, the first of which discussed the panel's charge, the WIC program, and methods for estimating WIC eligibility and participation, and the second of which was a workshop to examine components of the estimation methodology in more detail, and to learn more about how the WIC program operates in states. Agendas for both of these meetings are included in Appendix B. In preparation for the panel's work, FNS contracted with Mathematica Policy Research Inc. to prepare a report that reviewed the estimation methodology and identified several data and methodological issues (U.S. Department of Agriculture, 1999a). This overview report, the presentations and background information presented at the panel meetings, and the deliberations of the panel in closed sessions were all considered in the development of this Phase I report.

Phase II of the study will examine in greater detail the methods used to estimate eligibility and participation and consider alternative potential improvements in these methods. Other topics the panel did not have time to consider in much detail during the first phase will also be examined, including: the use of the Survey of Income and Program Participation to estimate income eligibility, methods for estimating the number of pregnant and postpartum women, and assumptions used to estimate the number of eligible people from the U.S. territories. A final report of the panel will be issued at the end of the second phase of the study.

The remainder of this chapter provides background on the WIC program. Chapter 2 discusses WIC eligibility regulations and the difficulty of matching estimation methods and data to fit these regulations. Chapter 3 briefly reviews the current FNS methods for estimating eligibility and participation. Chapter 4 focuses on six different components of the method for estimating the number of people eligible for WIC. Methods for estimating the number of full-funding participants are discussed in Chapter 5. Finally, Chapter 6 discusses issues the panel will consider in the second phase of the study.

## WIC PROGRAM BACKGROUND

WIC began in 1972 as a pilot program and has grown rapidly as the number of people served per month has increased from 205 thousand in FY1974 when it became a permanent program, to 3.6 million in FY1988, to 7.2 million in FY2000. The program provides three types of benefits to those who are eligible: food instruments, usually in the form of vouchers or checks, that can be exchanged for specific types of food from participating retail grocers; nutrition education; and referrals to health care and to other social services. In order to receive WIC benefits, an applicant must be categorically eligible, income eligible, and nutritionally at risk. There are five categories of eligibility: pregnant women, women who are not breastfeeding and are less than 6-months postpartum, women who are breastfeeding and are less than 1 year postpartum, infants (age 0 to 1 year); and children age 1 through 4 years. The contents of food packages differ for each eligibility category; for example, the food package for a non-breastfed infant includes infant formula, while the food package for a child includes milk, juice, cereal, and eggs.

To be income eligible, an applicant's income must be at or below 185 percent of the U.S. poverty income guidelines. In addition, those who are



enrolled in the federal Medicaid, Food Stamp, or Temporary Assistance for Needy Families (TANF) programs are also adjunctively eligible for WIC even if their income exceeds 185 percent of poverty. Applicants must also be determined to be at nutritional risk on the basis of an assessment conducted by a competent professional authority at the WIC site. To be certified as nutritionally at risk, an applicant must meet at least one of the nutritional risk criteria. These risk criteria fall under five broad categories: anthropometric risk (e.g., underweight, obesity); biochemical risk (e.g., low hematocrit); medical risk (e.g., diabetes mellitus); dietary risk (e.g., inappropriate dietary patterns); and predisposing factors (e.g., homelessness). In order to be certified to receive WIC benefits, a person must fit into one of the five categories of eligibility; must have income at or below 185 percent of poverty or be adjunctively eligible for WIC through enrollment in Medicaid, TANF or the Food Stamp Program; and be assessed as nutritionally at risk. The length of certification for WIC depends on the category of eligibility. Pregnant women can be certified from the time they become pregnant through 6 weeks postpartum. Postpartum women are certified for up to 6 months if they are not breastfeeding and up to a year if they breastfeed for more than 6 months. Infants are certified for 6 months or for 1 year—most often for an entire year. Children are usually certified every 6 months.

The federal government gives grants to states and Indian tribal organizations to provide the food, nutrition education, and health and social service referrals, and to administer the program. State food grant allocations are based on the amount the state received in the previous year and the estimated number of eligible persons for that state. States then fund local agencies who actually provide the services to participants.<sup>1</sup> If local agencies do not have enough funding to serve all eligible persons who want to participate, they place participants on a prioritized waiting list. Priority is based on the type of nutritional risk and the eligibility category (see U.S. Department of Agriculture, 2001, for information on the WIC priority system). The last year a state had to implement a priority waiting list was 1999. In cases in which states have had shortages of funds to serve all who wanted to participate, supplemental funding was usually obtained from the federal government.

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<sup>1</sup>States can provide their own funding for the program. In FY 2001, 12 states contributed a total of \$44.5 million of their own funds.

## Program Eligibility

The language of the congressional act that established the WIC program states the reason for the program's establishment: "Congress finds that substantial numbers of pregnant, postpartum, and breastfeeding women, infants and young children from families with inadequate income are at special risk with respect to their physical and mental health by reason of inadequate nutrition or healthcare, or both" (Sec. 17 [42 U.S.C. 1786] of the Child Nutrition Act of 1966). "It is, therefore, the purpose of the program . . . to provide . . . supplemental foods and nutrition education . . . . The program shall serve as an adjunct to good health care, during critical times of growth and development, to prevent the occurrence of health problems, including drug abuse, and improve the status of these persons." This language is clear about the types of persons (categories) intended to be served—pregnant and postpartum women, infants, and young children with inadequate incomes. Later in the text of the act, the three overall criteria for WIC eligibility are delineated: categorical eligibility, income or adjunct eligibility, and nutritional risk.<sup>1</sup> If a person meets all of these criteria, he or she is "fully eligible" for the program.

Although the concept of eligibility intended by Congress in this act may seem straightforward, it can be difficult to determine eligibility in

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<sup>1</sup>Residency in the state or local service area to which the applicant is applying is also a requirement for eligibility.

cases in which family living arrangements and resource sharing are complex. For example, it is not always clear how many people are a part of the family or “economic unit” and thus whose income counts in determining income eligibility when multiple families share resources and expenses. In some cases, there is more than one way to count the number of members and the incomes of the economic unit. As we discuss further in this chapter, WIC rules allow state and local agencies some flexibility in how the economic unit and other eligibility definitions are applied. As a result, there may be variation in how eligibility rules are applied. Variation in how rules are applied in the field creates uncertainty in estimates of the number of persons eligible. We discuss below a few areas in which the eligibility criteria are ambiguous enough to be applied differently for different situations. Our intent is to emphasize possible sources of variation for eligibility estimates—not to point out problems with the regulations and how they are interpreted in determining WIC eligibility.

In this section, we also discuss ambiguities in other eligibility concepts in which the definition of eligibility can be interpreted broadly or narrowly. For example, women who are pregnant are technically categorically eligible for WIC for their entire pregnancy, even though a woman is likely not to know she is eligible right away. A broad definition of eligibility may assume that women are categorically eligible as soon as they become pregnant, while a narrow definition may consider women categorically eligible as soon as their pregnancy is confirmed. Again, the purpose of this discussion is to introduce areas in which measurement of eligibility is a tricky concept that may result in systematic biases in estimates depending on what one sees as the true definition of eligibility.

### CATEGORICAL ELIGIBILITY

Five groups are eligible for WIC: infants, children ages 1 to 5, pregnant women, nonbreastfeeding women up to 6 months postpartum, and breastfeeding women up to 12 months postpartum. The latter three are not as easily identified in measuring eligibility. Given the example above, it is not clear if, for the purposes of estimating eligibility, a pregnant woman should be considered categorically eligible as soon as she becomes pregnant or as soon as her pregnancy is confirmed. As we detail later, current methods for estimating eligibility count women as eligible for a full 9 months of pregnancy. In practice, however, a lag occurs between conception and the confirmation of pregnancy. The current methodology is

consistent with the rules of eligibility in that, technically, a woman is eligible as soon as she becomes pregnant. However, because of the timing lag, 100 percent participation of eligible women defined in this way would never be possible. Thus, in theory, a narrow definition of eligibility could consider someone eligible for only the period after pregnancy is confirmed.

Data on the lag between conception and pregnancy confirmation are not available. However, data on when pregnant women enroll in WIC are available. The 1998 WIC Participant and Program Characteristics Report indicates that 47 percent of pregnant women who participated in WIC enrolled in the program during the first trimester of pregnancy, 38 percent enrolled in the second trimester, and 12 percent enrolled in the last trimester (4 percent did not report data) (U.S. Department of Agriculture, 2000a). Thus, at least half of the pregnant women participating in WIC did not enroll until they were at least 4 months pregnant.

Postpartum women are eligible for WIC for 6 months if they do not breastfeed their infant or for two 6-month certification periods (up to a year postpartum) if they are breastfeeding. Women who breastfeed at least once a day on average are conferred breastfeeding status. Women who stop breastfeeding before the end of a certification period will be identified as nonbreastfeeding only if they visit a WIC clinic to request a change in the infant's food package.

### INCOME ELIGIBILITY

The WIC income verification process is, in general, less burdensome than the income verification processes of other public assistance programs, such as Temporary Assistance for Needy Families (TANF) and food stamps. Until recently, states could determine what documentation of an applicant's income was needed to verify eligibility. Standards for income documentation varied quite a bit across states. For example, in 1998, only 51 percent of local agencies required income documentation (U.S. Department of Agriculture, 2000a). However, legislation passed in 1998 implemented standard income documentation requirements for applicants who are not adjunctively income eligible for WIC.

State and local agencies are still given some flexibility in how they determine income eligibility. Specifically, WIC personnel have some discretion in defining the economic unit (i.e., the family unit) and the period of time over which income should be counted. Technicalities of how adjunctive eligibility is defined also give some flexibility to WIC personnel

in assessing adjunctive eligibility status. We discuss each of these flexibilities and how they can introduce errors into the process of estimating WIC eligibility.

### **Economic Unit**

Defining the economic unit determines which household members' incomes are counted and how many people are part of the economic unit when income eligibility is assessed. WIC program regulations use the following definition of an economic unit: "a group of related or nonrelated individuals who are living together as one economic unit" (U.S. Department of Agriculture, 2000b:295). A WIC policy memorandum interprets these regulations (Final WIC Policy Memorandum 99-4:8):

It is reasonable to assume that persons (other than those living in institutional settings and homeless facilities) living in the residences of others, whether related or not, are likely to be receiving support and some commingling of resources which renders them members of the economic unit with which they live. However, it is possible to establish that more than one economic unit lives under one roof through appropriate questioning, which helps to make a reasonable determination that there is general economic independence of the units, i.e., that financial resources and support are retained independently. For example, a pregnant woman who is sharing an apartment with her sister may be determined to be a separate economic unit from her sister if the certifier can reasonably establish that she has a source of income and is paying her proportionate share of household, living and personal expenses.

Assessing which members of a household are part of the economic unit therefore implies that individual WIC staff members may need to ask applicants a series of detailed questions about their living situations and with whom and how they share incomes and expenses. In the example of a pregnant woman, the WIC staff member must sort out whether the pregnant woman has an income source and whether she pays her proportionate share of the household's expenses. It is unlikely that all caseworkers will ask the same questions to determine who pays what and how much, and therefore it is unlikely that all WIC staff members will make the same eligibility assessment, even when serving people with identical circumstances. Some WIC staff members may be generous in assessing who is part of the family unit, while others may be strict. In this report, we consider both a generous

definition—one that considers whichever family unit makes the applicant eligible as the correct definition—and a restrictive definition—one that considers whichever definition makes the family ineligible.

### **Accounting Period for Income**

The definition of income (that is, what sources count) is clearly laid out in the regulations (see Chapter 3). However, the regulations concerning the time frame over which income should be measured are vague and present problems for operationalizing an accounting period for estimating eligibility (U.S. Department of Agriculture, 2000b:307):

In determining the income eligibility of an applicant, the State agency may instruct local agencies to consider the income of the family during the past 12 months and the family's current rate of income to determine which indicator more accurately reflects the family's status. However, persons from families with adult members who are unemployed shall be eligible based on income during the period of unemployment if the loss of income causes the current rate of income to be less than the State or local agency's income guidelines for Program eligibility.

Although an instruction memo provides some guidance, it still leaves the states with considerable flexibility (Food and Nutrition Service Instruction Memo 803-3:5):

State agencies have, and should exercise, flexibility in deciding whether to use an applicant's current or annual rate of income. For example, the family of a striker may have a lower income during the period of a strike (depending on the union benefits and other sources of income), but have an annual income which would exceed the WIC limit. In this case, the use of current income (while on strike) may be more appropriate. However, in the case of families of self-employed persons, including farmers or seasonally employed persons whose income fluctuates, annual income may be the more appropriate indicator of the need for WIC benefits. Other examples in which the use of annual income is more appropriate include: (1) a family member who is on a temporary leave of absence from employment, such as maternity leave or to take an extended vacation; (2) teachers who are paid on a 10-month basis and are temporarily on leave during the summer months; and (3) college students who work only during the summer months and/or their school breaks.

Again, the accounting period for income is subject to state discretion. Variation in how local WIC staff workers apply rules about the accounting pe-

riod for income creates the potential for errors in estimating eligibility because definitions of income used to estimate eligibility may not exactly match definitions of income as they are applied by local WIC offices in assessing eligibility.

### **Adjunctive Eligibility**

Adjunctive eligibility rules further complicate efforts to measure eligibility. A person is adjunctively eligible for WIC and does not need to go through the WIC income certification process if she can document that she is certified fully for the Food Stamp, Temporary Assistance for Needy Families (TANF) or Medicaid programs. The regulations read (Final WIC Policy Memorandum 99-4:6):

By law, persons and/or certain family members certified as eligible to be enrolled in any of these [Food Stamp Program, TANF, or Medicaid] at the time of their application to WIC are adjunctively eligible for WIC, and . . . are not subject to the income guidelines used for traditional WIC income eligibility certification.

Because of differences among states in eligibility rules (some states have Medicaid income eligibility thresholds above 185 percent of poverty guidelines), it is possible to be income ineligible for WIC but income eligible for Medicaid.<sup>2</sup> Thus, in a broad sense, everyone who is eligible for Medicaid (or food stamps or TANF) is also eligible for the WIC program. The regulation that a WIC applicant must be enrolled in the Food Stamp Program, TANF, or Medicaid to be adjunctively eligible for WIC is really a technicality, since all the applicant needs to do is apply and enroll in one of these three programs to be eligible for WIC. A WIC staff member assessing eligibility of a WIC applicant may find that the applicant has income greater than the WIC eligibility threshold but less than the Medicaid threshold. The applicant may be encouraged to enroll in Medicaid, which would make them eligible for WIC. This would not be inconsistent with the intent of the program to serve as an adjunct to improved health.

Therefore, one measure of how many people are adjunctively eligible for WIC is the number eligible for the Food Stamp Program, TANF, or

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<sup>2</sup>See Lewis and Ellwood (1998) for a review of differences in Medicaid and WIC eligibility rules.

Medicaid. However, not everyone who is eligible for Medicaid, TANF or food stamps will enroll in them, so this measure may not accurately reflect the number of people who are currently enrolled in the program—and therefore adjunctively eligible for WIC. To accurately estimate how many people are adjunctively eligible for WIC, it is not clear if it is more appropriate to make an estimate that considers all those who are eligible for the other programs eligible for WIC, or to make an estimate that considers only those enrolled in the other programs eligible for WIC. We return to this issue later in the report.

### **NUTRITIONAL RISK DETERMINATION**

The final step in determining eligibility is assessing nutritional risk. To be fully eligible for the program, a competent professional authority must determine that an applicant meets at least one of the many nutritional risk criteria allowed. Prior to 1998, states had a great deal of discretion on what criteria were used to assess nutritional risk. Now nearly all criteria are standardized across states. In practice, however, it appears that very few income eligible people fail to meet at least one of the nutritional risk criteria. In Chapter 4, we consider current assumptions about the proportion of income eligible individuals who are at nutritional risk and methods and data used to estimate nutritional risk.

### **SUMMARY**

The true pool of eligible persons depends on how the eligibility rules for the program are set, which is the policy choice Congress makes. This chapter has highlighted some components of the eligibility rules that are not always easily applied to every family that comes into a WIC office. The lives of those who apply for WIC can be quite complex, and it would be very difficult to define eligibility rules that could apply to every case that seeks assistance. As a result, there are components of the eligibility rules for which local WIC offices are given considerable flexibility in applying the rules. The consequence is that any estimates of eligibility will be made with uncertainty, simply because program rules may not be applied in a standardized way. The purpose of this discussion is not to suggest that more or less standardization of the rules is needed—that is not the panel's charge and it is actually quite clear from the regulations and their instructive guid-



ance that much discretion has purposefully been given to the states. Rather, our purpose in highlighting the difficulties in applying eligibility rules is to illustrate a source of uncertainty in estimating eligibility. The panel's task is to consider the best scientific methods for estimating eligibility according to the laws Congress has set.

## Current Methods for Estimating Eligibility and Full-Funding Participation

Each year the Food and Nutrition Service (FNS) develops estimates of the numbers of people in the nation who are eligible for WIC and who would participate in the program if it is fully funded. These estimates are used to develop the annual budget request for the program and to estimate coverage rates—the ratio of participants to number of people estimated to be eligible. With bipartisan support of the goal to serve all who are eligible and who want to participate in WIC, the accuracy of these estimates is crucial to informing budgetary decisions.<sup>1</sup> In this chapter, we briefly describe the methods used to make the estimates. An FNS publication (U.S. Department of Agriculture, 1999a) provides greater detail on currently used methods.

### **ESTIMATES OF THE NUMBER OF FULLY ELIGIBLE PERSONS**

Estimates of the number of persons eligible for the WIC program are produced separately for each category of eligibility. Estimates of the number of infants who are eligible are especially important in the process because the number of income eligible pregnant and postpartum women is derived from the estimated number of income eligible infants. Thus, estimates of income eligible infants and children are referred to as the “core” estimates.

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<sup>1</sup>The national estimates are also used as the benchmark for state eligibility estimates in that the sum of state estimates is adjusted to add up to the national total.

### **Income Eligibility Estimation Methods**

The March Demographic Supplement of the Current Population Survey (CPS) is used to estimate the number of infants and children living in families with annual incomes below 185 percent of poverty, defined by the U.S. Department of Health and Human Services poverty guidelines according to their family size.<sup>2</sup> Available eligibility estimates lag behind the budget process considerably. Calendar year 1999 estimates, based on the 2000 CPS, are the most recent available for the first stages of the FY 2003 budget process. Over the course of the budget approval process, the 2001 CPS data may become available (covering calendar year 2000) and may be used in the estimations for the 2003 budget. Thus, the estimates of numbers of participants will always be a few years behind.

In assessing family income in the eligibility determination process, states can adopt either the income guidelines for the Free and Reduced Price School Lunch Program or the income guidelines for free or reduced price health care programs. In general, the following income sources are counted under both guidelines: earnings, unemployment compensation, workers' compensation, Social Security, Supplemental Security Income, public assistance, veterans' payments, survivor benefits, disability benefits, pensions or retirement income, interest, dividends, rents, royalties and estates and trusts, education assistance, alimony, child support, financial aid from outside the household, and other income. If the free and reduced price health care definition is used, the following sources of income are excluded for determining eligibility: the value of in-kind housing and other in-kind benefits and payments or benefits provided under certain federal programs (e.g., some of the smaller social programs such the Low Income Home Energy Assistance Program, the value of benefits from the Free and Reduced Price School Lunch Program, and payments to members of various Indian tribes) (see Food and Nutrition Service Instruction 803-3, 1988). For the purposes of estimating eligibility, current FNS methods use annual census money income to define income.<sup>3</sup> Family is defined using the Census Bureau's family definition—that is, a group of two people or

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<sup>2</sup>The March CPS gathers data on family income for the previous calendar year (e.g., the 2001 March CPS collects income for the calendar year 2000). These data are usually available within 6 months of collection.

<sup>3</sup>This annual income measure includes income from the following sources: earnings; unemployment compensation; workers' compensation; Social Security; Supplemental

more related by birth, marriage, or adoption and residing together, including related subfamily members. Estimation issues surrounding these definitions are discussed later in the report.

The number of income eligible pregnant women is estimated based on the estimated number of income eligible infants. The estimated number of infants is multiplied by 0.75 to account for the pregnancy lasting for 9 months of a year. The number of births is assumed to be constant over the time period between when the estimates of infants are made and the 9 months prior to the birth of the infant.

The numbers of breastfeeding and nonbreastfeeding postpartum women are also estimated based on the core estimates of income eligible infants. To obtain estimates of both of these groups, the estimates of income eligible infants is first adjusted downward slightly to account for multiple births and infant deaths. (The number of income eligible infants is multiplied by 0.9844.)<sup>4</sup> The methodology then adjusts for the percentage of women who breastfeed and the duration of breastfeeding. These adjustment factors, based on data from the 1988 National Maternal and Infant Health Survey (NMIHS), are used in combination with life table methods to estimate the duration of breastfeeding among women, adjusting for age and income. The adjustment rate used to obtain the number of women who do not breastfeed and are less than 6 months postpartum is 0.374 (or 37.4 percent) and 0.171 (or 17.1 percent) for the number who breastfeed and are less than 12 months postpartum.

### **Adjunctive Eligibility Estimation Methods**

In estimating income eligibility for each of the categories, only a modest adjustment is made for infants and children who may be eligible for WIC because they are adjunctively eligible through participation in the Medicaid, Food Stamp, or Temporary Assistance for Needy Families

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Security income; public assistance; veterans' payments; survivor benefits; disability benefits; pension or retirement income; interest; dividends; rents, royalties, and estates and trusts; educational assistance; alimony; child support; financial assistance from outside the household; and other income.

<sup>4</sup>This adjustment is based on WES II data that indicate that multiple births are more prevalent than infant and fetal deaths. It is not clear why the estimates for postpartum women are adjusted to account for multiple births and infant mortality but the estimates of pregnant women are not.

(TANF) programs, and no adjustment is made for pregnant and postpartum women who may be adjunctively eligible.<sup>5</sup> However, it is possible that many people are eligible for these programs who would not otherwise be eligible for WIC because of differences in eligibility rules (as we discuss later in Chapter 4).

### Methods for Estimating Full Eligibility

Once the estimates of income eligible people for each eligibility category are made, adjustments for the percentage of people who are at nutritional risk are made for each category to obtain the number of fully eligible people. The adjustment factors are based on estimates of the percentage of income eligible people who are at nutritional risk from the WIC Evaluation Study I (U.S. Department of Agriculture, 1987).

### ESTIMATION OF FULL-FUNDING PARTICIPATION

Once the estimates of the number of fully eligible people are made, the numbers are adjusted downward to account for the fact that some who are eligible do not participate. Past practice in making this adjustment has been to assume that participation rates for WIC would mirror participation rates for the Food Stamp Program for children age 0 to 4 years. Until recently, participation rates for these programs from the late 1980s were used as a guideline for adjusting the eligibility estimates, meaning that roughly 80 percent of eligible people were estimated to participate. This adjustment was criticized for being out of date and lower than what actual participation rates for the Food Stamp Program were during that period (Greenstein et al., 1997). Beginning with the 1995 estimates and the FY 1998 budget report, the U.S. Department of Agriculture (USDA) has not

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<sup>5</sup>The methodology adds 14,000 infants and 76,000 children to the core estimates of the number of income eligible infants and children, which accounts for only 0.9 percent of all estimated eligible infants and only 1.1 percent of all estimated eligible children in 1998. This adjustment was originally used to account for infants and children who lived in households with pregnant women eligible and enrolled in Medicaid who were not income eligible for WIC if the pregnant woman was counted as one person, but who were income eligible for WIC if the pregnant woman was counted as two people (e.g., the family size distinction affected whether the family's income was above or below 185 percent of the poverty guideline).

used the 80 percent participation assumption, but rather, has made budget requests with a goal of serving 7.5 million participants. This practice has been criticized as being arbitrary and not supported by data (U.S. House of Representatives, 1998).

### COVERAGE RATES AND PREDICTION ERROR

Coverage rates are used as a tool for evaluating the program's performance and assessing how reasonable the budget requests were ex post. Coverage rates are defined as the ratio of the monthly average number of participants receiving WIC over a calendar year to the average monthly number of individuals estimated to be fully eligible for WIC over the calendar year. The average monthly number of participants comes from administrative records. The denominator is the eligibility estimates derived from the March CPS that covers the calendar year in question. The FNS has provided the panel with their estimates of coverage rates by eligibility category from 1993 to 1999. The corresponding coverage rates for the four types of participants are presented in Table 3-1.

TABLE 3-1 Coverage Rates of Infants, Postpartum and Pregnant Women, and Young Children

Year	Infants	Postpartum Women	Pregnant Women	Children
1993	97.8	78.9	52.3	48.0
1994	111.0	101.2	59.0	56.9
1995	109.4	105.3	58.0	64.4
1996	113.8	117.2	62.0	69.5
1997	121.7	121.7	69.1	74.5
1998 <sup>a</sup>	127.7	127.4	72.9	74.4
1999 <sup>a</sup>	130.4	130.1	72.4	76.0

NOTE: Coverage rates are defined as the average monthly number of WIC participants (from administrative data) divided by the estimated number of eligible people (from the CPS) for each category for a given year.

<sup>a</sup>The coverage rate estimates for 1998 and 1999 are unofficial USDA estimates provided to the panel to show what the estimates would be using the existing methodology for those two years.

The table shows that for all eligibility categories, coverage rates have been generally increasing over the 1990s. Pregnant women and children have had the lowest coverage rates, which were both about 50 percent in 1993 and increased to 72 percent for pregnant women and 76 percent for children in 1999. Coverage rates for infants over the entire period have been very high. In 1993, coverage rates were almost 100 percent (98.3) and more recently in 1999 they were well over this mark at 130 percent. The most dramatic increases in coverage rates between 1993 and 1999 were for postpartum women, whose coverage rates have increased almost 65 percent, and for children whose coverage rates increased almost 60 percent. Coverage rates from postpartum women jumped considerably between 1993 and 1994 (from 78.4 to 101.2 percent) and have steadily increased since then.

Coverage rates for postpartum women and infants that are now well over 100 percent raise concerns. The Survey and Investigations Staff of the House Appropriation Committee writes, "The discrepancy between USDA eligible estimates and actual enrollment figures raises the question of whether the estimates are flawed or whether ineligible persons are participating in the program" (U.S. House of Representatives, 1998:i).<sup>6</sup> It is the panel's charge to focus on the former question—that is, whether the estimates of eligibility (and full-funding participation numbers based on these eligibility estimates) are flawed and can be improved.

The accuracy of the estimates of eligibility and participation have real implications for WIC program funding and for alternative uses of funding. On one hand, underestimating eligibility and participation may result in waiting lists of people who are eligible and want to participate but may not be given benefits. On the other hand, if estimates are too high, then funds for other programs or spending priorities could possibly have been greater.

An element of uncertainty is inherent to the process of forecasting budgetary needs for the upcoming year. A lag between the time the data

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<sup>6</sup>Of course, coverage rates under 100 percent could also use a flawed estimate of eligible people and could also reflect ineligible participation. The only evidence about whether and how big a problem ineligible participants may be is from the WIC income verification study conducted in 1989 and published in 1997 (U.S. Department of Agriculture, 1997); it found an average error rate (percentage of participants who were ineligible) of 5.6 percent. This study is over a decade old now and was conducted at a time when coverage rates were lower and before stricter income verification documentation requirements were implemented. Another income verification study was conducted in 1998; results of this study will be published in late 2001.

are collected and made available for use and the time period for which the predictions are being made will always exist, although one hopes that it is small. Economic, policy, demographic, and cultural conditions could change in such a way that the numbers of persons who are eligible and likely to participate change. Program outreach efforts could be successful in bringing greater percentages of eligible people into a WIC office to apply for benefits.

As a tool to evaluate how good the predictions of participation have been each year, we define a prediction error rate and estimate it for recent years. This error rate measures how well the estimated number of people eligible and likely to participate in a year compared with actual counts of participants from administrative data for that year. If  $N_t$  is the average monthly number of participants in year  $t$  (from administrative data) and  $P_t$  is the predicted number of participants for the same year (based on the estimates of the number of eligible people), then the prediction error rate for year  $t$  ( $ER_t$ ) will be

$$ER_t = 100 * \frac{(P_t - N_t)}{N_t}$$

To estimate the number of fully eligible participants, we multiplied the estimated number of fully eligible people for each category by 0.80, following FNS methods of assuming an 80 percent participation rate. This methodology did not account for differential participation rates by eligibility category. Since 1997 the FNS has not used this method to arrive at the number of likely participants for developing budget requests but has instead budgeted with a goal of serving 7.5 million participants. To calculate prediction error rates for a given year, the estimated number of participants for a given year are matched to the actual number of participants for that year. For example, the fiscal year 2000 estimates used 1997 CPS data. These data were matched with 1997 counts of actual participants to calculate the prediction error for 1997.

We note the difference and relationship between the coverage rates and prediction error rates. The coverage rates are measures of the percentage of the eligible population covered (or served) by the program. Prediction error rates are a measure of how close the estimated number of participants is to the actual number of participants. These two measures correlate in that both are computed using eligibility estimates. For example, high prediction error rates may reflect an understatement of eligibility because the



estimated number of participants is based on the estimated number of eligibles. Since the estimated number of eligibles is the denominator for the coverage rate, high prediction error rates could be reflected in high coverage rates if the number of estimated eligibles is underestimated. However, these two may not be related. For example, if the assumption about the rate for which eligible people participate is incorrect, high prediction error rates will result, but they may not be reflected in the coverage rate estimates because the eligibility estimates are correct.

Table 3-2 presents the panel's calculation of prediction errors overall and by eligibility category for recent years. Examining the prediction error rates for the total number of participants, we see that the FNS estimates are very close to the actual number of people who participated. Using 3-year-old CPS data, the total prediction error rates range in absolute value from 10.7 percent in 1996 to an almost zero error rate of 0.2 percent in 1998. The accuracy of these numbers is not due, however, to good predictions of the number of participants for each eligibility category. The total prediction errors are achieved by overestimating the number of participating pregnant women and children and underestimating the number of participating infants and postpartum women. In years prior to 1998, the FNS

TABLE 3-2 Prediction Error Rate (in percent) by Year and Eligibility Category

Year	Infants	Postpartum Women	Pregnant Women	Children	Total
1996	-21.6	-23.1	44.5	28.6	10.7
1997	-30.7	-30.2	22.3	21.8	1.8
1998	-29.8	-29.6	23.0	17.6	-0.2
1999	-31.8	-32.9	21.3	19.6	-0.7

NOTE: Prediction error rates were calculated by the panel using the following formula:

$$ER_t = 100 * \frac{(P_t - N_t)}{N_t}$$

where  $ER_t$  is the prediction error rate for year  $t$ ,  $P_t$  is the predicted number of participants in year  $t$  based on current USDA methodology for estimating eligibility and likely participation, and  $N_t$  is the actual number of participants in year  $t$  from administrative records. Predicted numbers of participants are calculated from Current Population Survey data from three years prior to the prediction year.

methodology overstated the total number of participants because errors in predicting the number of pregnant women and children were larger in absolute value than the errors in predicting postpartum women and infants. For example, in 1996, the number of children predicted to participate was overestimated by 28.6 percent and the number of pregnant women predicted to participate was overestimated by 44.5 percent. This is in comparison to an underestimation of 21.6 percent for infants and 23.1 percent of postpartum women. In recent years, prediction error rates for pregnant women and children have fallen in magnitude, while error rates for postpartum women and infants have risen. For example, in 1999, the numbers of children and pregnant women participants were overestimated by 19.6 and 21.3 percent, respectively, but the numbers of infants and postpartum women were underestimated by 31.8 and 32.9 percent, respectively, that year.

The figures shown in Tables 3-1 and 3-2 exemplify the wide variation in coverage rates and prediction error rates by category of eligibility. In general, coverage rates have been increasing over recent years. However, prediction error rates have been decreasing (in absolute value) for pregnant women and children but increasing for infants and postpartum women.

## Potential Biases in Eligibility Estimates

Concerns over high coverage rates for infants and postpartum women have led some observers to conclude that the Food and Nutrition Service's (FNS) estimates of the number of eligible individuals are biased and understate the true number of eligible people. While numerous assumptions are made in the FNS estimation strategy, the panel chose to examine the assumptions likely to have the greatest impact on the estimate of the number of individuals eligible for WIC. In particular, the following estimation concerns are examined in this chapter:

- The accuracy of the Current Population Survey (CPS) in counting all infants and children;
- Adjunctive eligibility through Temporary Assistance for Needy Families (TANF), the Food Stamp Program, and Medicaid;
- Use of monthly income versus annual income to determine income eligibility;
- Adjustment for 6-month certification periods;
- Definition of the economic unit; and
- The number of individuals who are at nutritional risk among those who are income eligible for WIC.

The FNS identified three additional areas of the estimation strategy that could potentially affect estimates of the number of eligible individuals (U.S. Department of Agriculture, 1999a). These include the use of alter-

native data sources, such as the Survey of Income and Program Participation; the timeliness of the data used in the estimation; and assumptions concerning breastfeeding rates among postpartum women. In the second phase of the study, the panel plans to consider these issues as well as others, which are outlined in Chapter 6.

### ACCURACY OF THE CURRENT POPULATION SURVEY

The primary database for FNS's annual estimates of the number of income eligible infants and children is the March supplement of the CPS. This nationally representative survey of the population collects demographic and income information from over 55,000 American households. Utilizing the CPS information on the number of family members, family income, and age of persons in the family, FNS makes two core estimates: (1) the number of infants who live in families whose annual income is less than 185 percent of federal poverty guidelines and (2) the number of children who live in families whose annual income is less than 185 percent of federal poverty guidelines. While the accuracy of both of these core estimates is crucial, the accuracy of the estimates of the number of infants is especially important for two reasons. First, the number of income eligible infants is the base from which the number of pregnant and postpartum women eligible for WIC is inferred. Hence any errors in estimating the number of income eligible infants would also be reflected in the estimates of the number of income eligible women in these groups. Second, high estimated coverage rates of infants and postpartum women led the panel to question whether the numbers of eligible people in these groups were being properly estimated.

To consider the accuracy of the CPS estimates of total number of infants and children, the panel asked the Census Bureau to make a presentation at the panel's Workshop on Estimating WIC Eligibility and Full-Funding Participation. Notes from the presentation by Gregory Spencer of the Census Bureau Division of Population Estimates were given to the panel for its consideration (Spencer, 2001). To assess the accuracy of the CPS estimates, Spencer (2001) compared weighted CPS sample estimates of the numbers of infants and children to the CPS control totals. These control totals are estimated from the Census Bureau's annual estimates of the noninstitutionalized U.S. population of infants and children (which are produced using birth and death records from vital statistics data with an adjustment for migration) plus an adjustment for the net undercount in

the 1990 decennial census. These CPS control totals for infants and children were compared with weighted CPS sample estimates of infants and children. Person weights for the CPS are developed for each person of a given age, race, and gender and should ensure that CPS sample estimates of the population of infants and children match the control totals for those age groups. However, data provided in Spencer (2001) show that weighted CPS sample estimates of infants and children do not match control totals. Table 4-1 shows the percentage difference between weighted counts of infants and children from the CPS and their respective control totals as of March of the given year. These estimates indicate that the CPS weighting scheme utilized by the Census Bureau consistently underrepresents the number of infants, but that since 1994, it consistently overrepresents the total number of children.

To understand why the weighted counts of infants and children do not add up to the control totals, Spencer (2001) provides a detailed description of how the weights are constrained to the control totals. The number of white male and white female infants are constrained to add to the CPS's control totals for each age with single-year intervals (i.e., separately for age 0, age 1, age 2, etc.). However, the number of nonwhite infants is not required to match totals for single-year age intervals because sample sizes

TABLE 4-1 Percentage Difference Between the Weighted Current Population Survey Counts of Infants and Children and Control Totals from Population Estimates

Year	Percentage Difference		
	Infants	Children	Infants and Children
1992	-2.0	-2.6	-2.4
1993	-1.0	-2.4	-2.2
1994	-1.1	0.4	0.1
1995	-2.9	1.0	0.2
1996	-0.7	0.5	0.2
1997	-2.6	0.4	-0.2
1998	-1.0	0.3	0.1
1999	-4.1	0.9	-0.1
2000	-2.4	0.7	0.1

SOURCE: Calculations by panel from estimates provided by Spencer (2001).

for these two groups are too small to do so. In particular, black male and black female weights are each constrained to match totals for 2-year age intervals (i.e., infants and 1-year-olds together; 2- and 3- year olds together; and 4- and 5- year olds together). For males and females of other races, separate gender weights are each constrained to totals for 5-year age intervals (i.e., all infants and children aged 0 through 5). The net effect of not controlling the weights to single-year age intervals for nonwhite infants appears to be the primary reason for the systematic underrepresentation of infants on the CPS.

Over the nine years of data presented in Table 4-1, the CPS underrepresents the *total number* of infants by an average of 2 percent each year. Because the incomes of black families are, on average, lower than incomes of white families, it is therefore likely that the number of *income eligible* infants is understated by more than 2 percent. This inference requires further investigation, however. In addition, the most appropriate method to rectify this problem needs to be examined. Currently, the panel foresees two options. One option is to reestimate the CPS person weights for infants and children to reflect the Census Bureau's population and undercount estimates for narrowly defined age groups that are relevant for WIC eligibility estimates. The second option is to construct an adjustment factor that could be applied to any calculations made from the CPS to reflect the underrepresentation of infants.

Finally, the discussion above assumes that the Census Bureau's control totals reflect an accurate estimate of the number of infants and children in the population. Analysis of the 2000 census would provide valuable insights into whether this assumption is valid. Such an analysis is beyond the scope of the panel's charge, however.

### ADJUNCTIVE ELIGIBILITY

Current methods used to estimate the number of people who are income eligible for WIC do not account for those adjunctively eligible through participation in TANF or the Food Stamp Program and make only a small adjustment for Medicaid adjunctive eligibility. This small adjustment has been recognized as inadequate by FNS. The panel concurs that the current FNS methodology inadequately accounts for adjunctive eligibility. This section presents simulations of the number of people who are adjunctively eligible for WIC through the TANF, Food Stamp, or Medicaid programs.

### **Eligibility Rules for WIC, Medicaid, TANF, and Food Stamps**

There are several notable differences in WIC income eligibility rules and the income eligibility rules of Medicaid, TANF, and food stamps. These differences are important in this context because some people who are not income eligible for WIC may be eligible for one of the other three programs, and could then be adjunctively eligible for WIC if they enroll in one of the other programs. Most notable are those differences between Medicaid and WIC eligibility because the income thresholds for Medicaid are higher than those of TANF and food stamps, and in some states, higher than the WIC threshold. As of 1998, the income thresholds for Medicaid for infants were above the 185 percent of poverty guidelines of WIC in eight states: Arkansas, California, Hawaii, Minnesota, Rhode Island, Tennessee, Vermont, and Washington. With the exception of California, each of these states also have income eligibility thresholds for children that are also above 185 percent of poverty. Furthermore, all but Arkansas and Washington also have income eligibility thresholds for pregnant women that are above the WIC threshold. There are other important differences between WIC and Medicaid eligibility rules. As of 1996, 37 states have medically needy programs that allow subtractions of medical expenses from income for determining eligibility. Medicaid also allows other income disregards, whereas WIC considers only gross income. Therefore, some people may be adjunctively eligible through Medicaid if their net income is below but their gross income is above 185 percent of poverty. In all, 13 states had Medicaid net income limits for infants, 10 states had net income limits for children age 1 to 5, and 11 states had net income limits for pregnant women that exceeded 185 percent of poverty guidelines as of 1998. There are also differences in the Medicaid and WIC definitions of families, periods of certification, and eligibility redetermination. Lewis and Ellwood (1998) discuss the differences in Medicaid and WIC eligibility rules in more detail. Because of these differences in program eligibility, some observers have criticized FNS's small adjustment for Medicaid adjunctive eligibility (Greenstein and Ku, 2000).

Differences between the Food Stamp, TANF, and WIC eligibility rules have received less attention with respect to adjunctive eligibility (probably because the income thresholds for these programs are lower than the threshold for WIC), although some differences in rules are noteworthy. First, both the Food Stamp Program and TANF have monthly certification periods, while WIC has 6-month and yearly certification periods. Current

FNS methodology to estimate WIC eligibility uses annual income instead of monthly income. If a family has a month or two in which their income is low, they might apply for food stamps or TANF and become certified for those months and hence eligible for WIC. Use of annual income for WIC eligibility estimation may not count these people as eligible.

Second, the income concept employed for WIC eligibility includes payments from means-tested cash programs such as TANF and Supplemental Security Income (SSI). The inclusion of payments from TANF in the measure of income used to assess income eligibility for WIC raises the possibility that infants and children who receive TANF are determined to be income ineligible even though they would be adjunctively eligible because of their participation in TANF. Currently no adjustment is made for infants or children whose annual income places them above 185 percent of the poverty guidelines, but who may actually be certified as eligible because of their participation in TANF or the Food Stamp Program.

### **Estimates of the Number of Infants and Children Adjunctively Eligible for WIC**

To estimate the number of infants and children who are eligible to receive WIC benefits, information about the income of the child's economic unit is not sufficient to determine their eligibility. WIC eligibility can also be gained through enrollment in means-tested programs (TANF, food stamps, and Medicaid). While the CPS collects both income and program participation data on individual families and households, these measures are insufficient for two reasons. First, the CPS collects only annual income data. The use of annual income as opposed to monthly income is believed to understate the number of infants and children who would be eligible on the basis of their monthly income. Second, individuals tend to underreport their participation in means-tested programs to surveys such as the CPS.<sup>1</sup> The direct use of the survey data on program participation would then in turn understate the number of infants and children who would be adjunctively eligible for WIC because of their participation in other means-tested programs, particularly Medicaid.

To rectify the deficiencies in the CPS data for purposes of predicting

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<sup>1</sup>See Bavier (1999), Primus et al. (1999), and Wheaton and Giannarelli (2000), for recent accounts of underreporting of transfer program participation and income in the CPS.



program eligibility in WIC and other means-tested programs, researchers have resorted to modifying the survey data at the individual level through the use of modeling techniques known as microsimulation models. For this study, the panel employed data produced by the Transfer Income Microsimulation 3 (TRIM3) model. (TRIM is explained in more detail in Appendix D.) This model was developed and is maintained by the Urban Institute with funding from the Department of Health and Human Services. It has been used for over 30 years to analyze changes in eligibility rules for means-tested programs such as AFDC and Medicaid, as well as major welfare reforms including the 1996 welfare reform act leading to the formulation of the TANF program.

To examine the possible magnitude of the number of people adjunctively eligible through participation in TANF, the Food Stamp Program, and Medicaid, the panel requested the Urban Institute to extract data from the TRIM model. These data are based on the March 1999 CPS and contain the person records of 12,708 infants and children. Each record contains information on the number of members of the family unit, income of the family (as defined by the census money income definition), and whether the child was covered by any private or governmental health insurance. These variables reflect the values reported by the family to the CPS but with an adjustment the TRIM model makes to ensure that the data match data on program participation from administrative records collected as part of the programs: the number of months the child was enrolled in TANF, the number of months enrolled in the Food Stamp Program, and the number of months enrolled in Medicaid. Utilizing data from the CPS and information on state Medicaid programs, the TRIM model imputed the number of months that the child would be eligible for Medicaid. Based on each family's annual income and some assumptions about seasonal income patterns, the TRIM model also imputed estimates of each month's income through the year.<sup>2</sup> Appendix D provides additional details on how monthly income is simulated from the CPS in the TRIM model.

Current FNS methodology for estimating eligibility was applied to these data to replicate the counts of income eligible infants and children.

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<sup>2</sup>Income from sources other than transfer programs also tends to be underreported in surveys. TRIM does not make adjustments for underreporting of income from these other sources.

TABLE 4-2 Adjunctive Eligibility Adjustments and Simulated Estimates of the Number of Income Eligible Infants and Children (counts are in millions)

	Infants		Children	
	Counts	% Change from Baseline	Counts	% Change from Baseline
Baseline (using current FNS methodology with TRIM3 data)	1.475		6.307	
Annual incomes less than 185 percent of poverty guideline or participated in TANF or Food Stamp Program	1.619	9.8	6.645	5.4
Include Medicaid participants	2.146	45.4	7.640	21.1
Include uninsured Medicaid eligibles	2.200	49.2	7.775	23.3
Include all Medicaid eligibles	2.422	64.2	8.673	37.5

SOURCE: Calculations by panel using data provided by the Urban Institute.

We estimated that 1.475 million infants and 6.307 million children in the nonterritorial United States would be income eligible for WIC during 1998.<sup>3</sup> This closely approximates FNS's estimates of 1.488 million infants and 6.359 million children for 1998.<sup>4</sup> We will call the 1.475 infants and 6.307 children the baseline estimates; they are presented in Table 4-2.

The panel next examined the extent to which this procedure excluded

<sup>3</sup>“Unrelated children” were identified as foster children and hence deemed to be eligible for WIC regardless of the foster family's income in accordance with FNS methodology.

<sup>4</sup>Our estimates based on TRIM data differ from the FNS estimates by 0.8 percent. This difference is due to the fact that TRIM data on income have been adjusted to account for underreporting of transfer income in the CPS data. Income data have been adjusted to reflect “simulated” public assistance that has been controlled to match aggregate state administrative totals. Hence there are fewer individuals who fall under the 185 percent poverty guidelines compared with the CPS public use files used by FNS.

infants and children who were enrolled in TANF or the Food Stamp Program at some point during the year. If we add the infants and children who enrolled for at least one month in either one of these programs during 1998, then the estimate of WIC eligibility rises to 1.619 million for infants and 6.645 million for children. This represents an increase of 9.8 percent in the infant population and 4.5 percent in the child population from the baseline estimates.

To estimate the number of additional infants and children who are eligible for WIC through Medicaid adjunctive eligibility, the panel provides an upper bound, a lower bound, and an intermediate estimate of eligibility. The WIC regulations state that to gain adjunctive eligibility through Medicaid, the infant or child must be enrolled and not merely eligible for Medicaid. However, all those eligible for Medicaid are essentially also eligible for WIC because all they must do is enroll in Medicaid to be considered adjunctively eligible for WIC. Therefore, an estimate of the number of people who are *eligible* for Medicaid is an upper-bound estimate of the number of infants and children who could gain WIC eligibility through enrollment in the Medicaid program. A lower-bound estimate for the number who could gain adjunctive eligibility would be those infants and children who were enrolled in Medicaid for at least one month in 1998. While these scenarios may provide both a lower and an upper bound for the impact of Medicaid adjunctive eligibility, both have problems. The upper bound of all eligible persons regardless of their enrollment status actually includes some people who are already covered by private health insurance. The lower bound does not include WIC applicants with incomes greater than 185 percent of poverty who are not enrolled in Medicaid but are eligible. This group can always apply for Medicaid and become adjunctively eligible for WIC. The panel also obtained an estimate that is in between the two bounds. This estimate added infants and children who were eligible for Medicaid but were not covered by private health insurance during the year. The estimates from these three scenarios are presented in Table 4-2.

The inclusion of all Medicaid eligible people has a large impact on the number of WIC eligible infants and children. Using these upper-bound estimates, the number of eligible infants rises to 2.422 million from 1.619 million, while the number of eligible children rises to 8.673 million from 6.645 million compared with estimates that account for annual income tests and adjunctive eligibility through TANF and Food Stamp Program participation. For infants, this represents a 50 percent increase in eligibility

estimates compared with the estimates that take food stamps and TANF adjunctive eligibility into account and a 64 percent increase from the baseline estimates. For children, this represents a 31 percent increase in eligibility estimates compared with the estimates that take Food Stamp and TANF adjunctive eligibility into account and a 38 percent increase from the baseline estimates. The large increases in the estimated numbers of eligible infants and children are not solely the result of increases in the Medicaid income limits beyond 185 percent of the poverty guidelines in some states. Rather, Giannarelli and Morton (2001) provide evidence that a large proportion of the increase in WIC eligibility actually comes from infants and children who live in states with Medicaid limits that are 185 percent of poverty or less. The reason is that Medicaid allows families to subtract from their gross incomes certain allowable deductions which results in a number of families with gross incomes exceeding 185 percent of poverty who are eligible for Medicaid.

In reality, not all applicants who are eligible for Medicaid will enroll, and some may already be covered by private insurance. A more conservative approach provides lower-bound estimates of those who are adjunctively eligible for WIC. These lower-bound estimates were constructed by including only those infants and children who had at least one month of enrollment in Medicaid. Results in Table 4-2 show that even this conservative approach represents a substantial increase in the number of income eligible infants and children. Compared with the estimate determined by annual income and adjunctive eligibility through TANF or the Food Stamp Program, the number of eligible infants rose from 1.619 to 2.146 million and from 6.645 to 8.673 million for children. For infants, this represents a 33 percent increase in eligibility estimates compared with the estimates that take Food Stamp and TANF adjunctive eligibility into account and a 45 percent increase from the baseline estimates. For children, this represents a 15 percent increase in eligibility estimates compared with the estimates that take Food Stamp and TANF adjunctive eligibility into account and a 21 percent increase from the baseline estimates.

If those infants and children who are Medicaid eligible but lack health care coverage are included, the number of income eligible infants rises from 1.619 to 2.200 million and from 6.645 to 7.775 million for children compared with the estimate determined taking adjunctive eligibility through food stamps and TANF into account. For infants, this represents a 36 percent increase in eligibility estimates compared with the estimates that take Food Stamp and TANF adjunctive eligibility into account and a 49 percent

increase from the baseline estimates. For children, this represents a 17 percent increase in eligibility estimates compared with the estimates that take Food Stamp and TANF adjunctive eligibility into account and a 23 percent increase from the baseline estimates.

Considering the total effect of adjunctive eligibility (including those adjunctively eligible through any one of the three programs) results in a large impact on the estimated number of eligible infants and children. Even if the conservative approach of including only those who participate or are enrolled in TANF, the Food Stamp Program, or Medicaid is taken, the effects are large. There is a 45 percent increase in the number of estimated eligible infants for WIC compared with the 1998 baseline estimate: the estimated number increases to 2.146 million from 1.475 million. For children, the increase is not as large but still sizable. The number of estimated eligible children increases 21 percent from 6.307 to 7.640 million. The substantially larger understatement of the number of infants relative to the understatement of the number of children helps explain why current estimates of coverage rates for infants are high both in absolute and relative terms to the coverage rates for children.

On the basis of these simulations, it is apparent that there are substantial numbers of infants and children who are adjunctively eligible for WIC but are not otherwise counted as eligible for WIC given current methods used to estimate eligibility. Current FNS methodology does not account for the substantial effect that adjunctive eligibility has on the total number of estimated eligible people. Therefore, current estimates of the number of income eligible infants and children are underestimated. Furthermore, because the number of eligible pregnant and postpartum women are derived from the number of eligible infants, it is probable that these numbers are also underestimated.

**Conclusion: Not fully accounting for adjunctive eligibility results in a substantial underestimation of the number of people eligible for WIC.**

The panel has not fully explored alternatives for estimating how many people are adjunctively eligible for WIC but future work will give this issue more consideration. For the remainder of this report, however, we take the conservative approach and count only those participating in other programs as adjunctively eligible. The estimations of eligible infants and children resulting from this approach are called the *new baseline estimates* in the remainder of the report. We do note that estimates of the number of

adjunctively eligible for WIC could be even larger if estimates counted all those eligible for Medicaid as adjunctively eligible for WIC regardless of their current Medicaid enrollment status, since more people are eligible for Medicaid but are not enrolled.

### USE OF ANNUAL VERSUS MONTHLY INCOME

Use of annual income to estimate income eligibility has been highlighted as one possible barrier to accurately estimating WIC eligibility (U.S. Department of Agriculture, 1999a; Gordan et al., 1997). While the WIC regulations are vague about the time period for determining family income, many observers suggest that using monthly income of the family would be closer to the rules employed by states and local WIC personnel. Given the variability of income over the course of the year, and especially around the birth of a child, the use of annual income or average monthly income will tend to overstate the family's income at the time of application for WIC. As an alternative to the use of annual income, the panel employed a monthly income test based on the family's worst income month or the month of the year in which the family's income was lowest. In this situation, if the family's lowest month's income was less than 185 percent of the poverty guidelines for a month, then the infant or child was considered income eligible for a full year.<sup>5</sup>

First, the panel compared the use of the worst month income test to the use of an annual income test, without including those individuals adjunctively eligible for WIC through enrollment in other transfer programs. These results are presented in Table 4-3. Adopting this difference only, the number of income eligible infants rose by 25 percent (from 1.475 to 1.845 million), while the number of income eligible children rose by 21 percent (from 6.307 to 7.612 million) compared with the original baseline estimates for each category. These results compare nicely to the estimates from Gordon et al. (1997), who used actual (nonsimulated) Survey of Income and Program Participation (SIPP) data. They performed two sets of calculations. One set constructed an estimate of annual income from the monthly SIPP data from three calendar years (1990-1992) and

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<sup>5</sup>Infants are certified as eligible for a year, while children and postpartum women are certified for 6-month periods. Later, we employ a 6-month certification period for children and reestimate the number of eligible children.

TABLE 4-3 Monthly Income Adjustments and Simulated Estimates of the Number of Income Eligible Infants and Children (counts are in millions)

	Infants		Children	
	Counts	% Change from Baseline	Counts	% Change from Baseline
Baseline	1.475		6.307	
Monthly income using “worst month” and no adjustment for adjunctive eligibility	1.845	25.1 <sup>a</sup>	7.612	20.7 <sup>a</sup>
New baseline (with adjunctive eligibility)	2.146		7.640	
Monthly income using “worst month” with an adjustment for adjunctive eligibility	2.230	3.9 <sup>b</sup>	8.306	8.7 <sup>b</sup>

<sup>a</sup>Percent change from baseline without accounting for adjunctive eligibility.

<sup>b</sup>Percent change from new baseline that takes adjunctive eligibility into account.

SOURCE: Calculations by panel using data provided by the Urban Institute.

used it to determine income eligibility. The other set employed the monthly income data and determined eligibility based on the worst month. They found that use of the worst month income test raised eligibility estimates by 25 percent for infants and 26 percent for children compared with estimates that used the constructed annual income measure. Hence, the TRIM-imputed monthly income flows are of the same order of magnitude as those calculated from actual (nonsimulated) data.

The adjunctive eligibility issue is closely related to the issue of income variability over the year. Consider a family that experiences a few months of unemployment and subsequent financial hardship within a year, but otherwise has income that is stable and above the WIC income threshold. This family may receive food stamps, TANF benefits, or Medicaid health insurance coverage during the months of hardship, making them adjunctively eligible for WIC as well. Furthermore, since WIC certification periods are for either 6 months or 12 months, these families may actually receive WIC longer than they receive food stamps, TANF, or Med-

icaid. Thus, estimates of how many infants and children are adjunctively eligible based on enrollment in these programs already captures some who would be eligible if the worst income month criterion was used. Since adjunct eligibility is part of the WIC regulations, in the panel's judgement this should be accounted for in the eligibility estimations. This is why we have chosen to estimate adjunctive eligibility before estimating eligibility using alternative definitions of income. The marginal impact of the use of monthly income is then measured from the base that takes account of adjunctive eligibility first (the new baseline estimates). Doing so, we estimate that 2.230 million infants and 8.306 million children would be eligible for WIC in 1998. The marginal impact of monthly income represents an increase of 4 percent for infants and 9 percent for children, compared with the new baseline estimates. Thus, once adjunctive eligibility is accounted for, the marginal impact of monthly income, while still sizable, is not as large as was previously suggested.

### **SIX-MONTH CERTIFICATION PERIOD FOR CHILDREN**

All of the estimates provided thus far in this report have assumed that an individual found to be eligible for WIC at a point in time is certified to be eligible for an entire year. For infants, this does indeed reflect WIC regulations. However, children must be recertified for eligibility every 6 months (as must postpartum women). Thus the estimates for adjunctive eligibility and the impact of monthly income may be overstated for this group.

To explore the effect of this shorter certification period for children, the panel conducted the following simulation. The Urban Institute data contain information about the number of months that the child participated in TANF, the Food Stamp Program, and Medicaid, as well as the number of months the family passed the income test. We considered the hypothetical situation in which monthly certification was employed to determine WIC eligibility. Under this hypothetical, an approximation to the number of months that the child was eligible for WIC was the maximum of the number of months the child had passed the income test, was adjunctively eligible, or both. To approximate 6-month certification, it was assumed that if a child had a minimum of 6 months of WIC monthly eligibility, then he or she was eligible for the entire year. However, if a child had less than 6 months of eligibility, then he or she was considered certified for only 6 months.



Employing this definition of certification, the average number of children eligible for WIC during 1998 was 7.913 million (these results are not presented in a table). Compared with previous estimates employing monthly income and adjunctive eligibility but annual certification for all children, this estimate is 5 percent lower; however, it is 4 percent higher than the estimate for children that employed annual income and adjunctive eligibility.

### DEFINING THE ECONOMIC UNIT

The current FNS methodology employs the Census Bureau's family definition to represent the WIC economic unit. A census family is defined as all persons related by blood or marriage who live together. For example, if a mother with an infant and a child lives with her two parents, then the FNS methodology would consider all five persons to constitute an economic unit for determination of WIC eligibility. However, as noted above, the regulatory definition of the economic unit allows considerable discretion on the part of WIC personnel. The staff member could determine that the mother, infant, and child are economically independent of her parents and hence would count only the income of this three-person unit, not the five-person unit, in determining eligibility for WIC. While the census family represents a broad definition of the economic unit, the panel recognized that a narrower definition of the economic unit could result in more individuals being identified as being eligible for WIC. The panel explored the use of an alternative definition of the economic unit that includes only parents and children under the age of 18 years. In our example, this alternative definition considers only the mother, her infant, and her child as the economic unit. For a lack of a better term, we denote this definition as the *narrow family* compared with a *broad family* definition that would consider the two parents of the mother (grandparents of the children) as part of the economic unit.

The panel used Urban Institute data and the TRIM model to examine the sensitivity of the estimated number of income eligible persons to the definition of a WIC economic unit. Two scenarios reflect alternative ways that WIC staff might assess different living arrangements. Under a *restrictive scenario*, we considered the infants and children to be eligible only if they were eligible under both the narrow and the broad definitions of a family. Under a *more generous scenario*, we considered them eligible if the family meets income eligibility requirements for at least one of the definitions.

The estimates of income eligible infants and children under the panel's new baseline estimates (including adjunctively eligible participants in the Food Stamp Program, TANF, and Medicaid) and these two scenarios are presented in Table 4-4.

The use of the restrictive scenario of the economic unit has only a small negative effect on the number of income eligible people. The estimated number of eligible infants falls by 0.2 percent, while the estimated number of children falls by 0.3 percent. The more generous scenario of the economic unit has a larger impact on the estimates of the income eligible people, but still a modest one overall. The number of eligible infants rises by 1 percent, while the number of eligible children rises by 1.5 percent from the new baseline estimates.

Giannarelli and Morton (2001) present estimates of the effect of these alternative unit definitions that suggest a much larger impact on the number of income eligible infants and children. However, the baseline they employed did not account for adjunctive eligibility. Our estimates employ a baseline that does account for adjunctive eligibility. The impact of these alternative definitions appears to be much more modest once adjunctive eligibility is accounted for in the estimates. Thus, the definition of the

TABLE 4-4 Definition of the Economic Unit and Simulated Estimates of the Number of Income Eligible Infants and Children (counts are in millions)

	Infants		Children	
	Counts	% Change from New Baseline	Counts	% Change from New Baseline
New baseline	2.146		7.640	
Eligible under both broad and narrow definitions of the economic unit	2.140	-0.2	7.614	-0.3
Eligible under at least one definition of the economic unit	2.166	1.0	7.754	1.5

SOURCE: Calculations by panel using data provided by the Urban Institute.

economic unit does not appear to be of much significance for estimating income eligibility and thus is not further explored here.

### **ESTIMATION OF THE PREVALENCE OF NUTRITIONAL RISK**

To be fully eligible to receive WIC benefits, applicants must also be found to be at nutritional risk. This requires meeting at least one of the many risk criteria for the state in which the applicant lives.<sup>6</sup> To account for this final eligibility requirement in estimating WIC eligibility, the FNS methodology adjusts the estimated number of income eligible persons downward by a constant percentage to account for those who are income eligible but not nutritionally at risk. Currently used adjustment factors by category are: 0.95 for infants, 0.752 for children, 0.913 for pregnant women, 0.933 for nonbreastfeeding postpartum women, and 0.889 for breastfeeding postpartum women. These adjustment factors were based on estimates of nutritional risk for income eligible individuals from the first WIC Eligibility Study (WES I) conducted in the early 1980s (U.S. Department of Agriculture, 1987). The WES I study developed a “modal” set of nutritional risk criteria (a list of the criteria most commonly used by the states) based on the operational definitions of the criteria used in each state at that time. Using this modal set of risk criteria with data on income, diet, and health status from the 1980 National Natality Survey (NNS) and the 1978-1980 National Health and Nutrition Examination Survey (NHANES II), WES I estimated the number of income eligible persons who were also at nutritional risk. The adjustment factor for infants was updated in 1991 from 72 percent to 95 percent to account for the fact that infants whose mothers participated in WIC are automatically considered nutritionally at risk.

#### **New Estimates of the Prevalence of Nutritional Risk**

The WES I nutritional risk analysis was recently reconsidered in the second WIC Eligibility Study (WES II) (U.S. Department of Agriculture,

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<sup>6</sup>Prior to 1999, criteria used by states varied widely and were unstandardized. However, states have now adopted standardized anthropometric, medical, predisposing, and certain dietary risk criteria. These are described in WIC Policy Memorandum 98-9, Nutritional Risk Criteria. An expert panel of the Institute of Medicine, the Scientific Basis for Dietary Risk Criteria for WIC Programs Committee, is currently examining dietary risk criteria in the still unstandardized category “Failure to Meet Dietary Guidelines.”

1993, 1996). WES II used data from the 1988 National Maternal and Infant Health Survey (NMIHS) and Phase I (1988-1991) of the National Health and Nutrition Examination Survey (NHANES III) to estimate the prevalence of nutritional risk among income eligible WIC populations. These estimates were produced by the firm Sigma One under contract with FNS in a report entitled "Nutrition Risk and Eligibility for WIC," in February 1999 (U.S. Department of Agriculture, 1999b). This study shows increases in the proportion of income eligible persons who are at nutritional risk for each category. Specifically, the study estimates that 90.4 percent of income eligible children, 88.4 percent of income eligible infants, and 95.2 percent of income eligible women were also at nutritional risk. These estimates are higher than those from the WES I study, except that the percentage of infants at nutritional risk is lower than the 95 percent adjustment factor currently used.

Concerns about the methods and inconsistencies in the report led the panel to conclude that the new estimates of the prevalence of nutritional risk in income eligible persons should not be adopted without further investigation. Two problems in the Sigma One report arise that warrant skepticism about its findings: the method used to combine data on nutritional risk prevalence from two datasets and the relationship between the estimated risks for infants and women.

WES II used the NHANES III Phase I survey to estimate the percentage of income eligible women who met at least one of the modal nutritional risk criteria mentioned previously.<sup>7</sup> NHANES III estimates show that 94 percent of women are at dietary risk (i.e., did not consume at least the minimum number of servings from food groups listed in the dietary criteria) and an additional 4.3 percent met the anthropometric and medical criteria. WES II also estimates the prevalence of medical risk for income eligible women from the NMIHS 1988. This survey includes measures of medical risk not found in NHANES III, but does not include measures of dietary risk. Estimates from NMIHS show that 72.1 percent of income eligible women are at medical risk compared with 83.4 percent in NHANES III (when dietary risk is not considered). To come up with a total estimate of nutritional risk, WES II averages these two medical risk

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<sup>7</sup>WES II considers only women of childbearing age (ages 15 to 46) and does not provide estimates separately for pregnant, nonbreastfeeding postpartum, and breastfeeding postpartum women.

estimates.<sup>8</sup> Taking the midpoint of the two estimates of medical risk does not seem appropriate. Since each dataset measures prevalence of medical risk based on different criteria, the combined number estimated at medical risk should not be lower than the larger of the two. For example, if NHANES measures anemia and finds 30 percent at risk and NMIHS measures miscarriages and finds 20 percent at risk on this basis, the combined estimate should be higher than 30 percent, since some who are anemic may not have also met the medical risk criteria on the basis of having a miscarriage. Furthermore, data from NHANES III alone indicate that 98.3 percent of women met at least one risk criterion. Yet the final estimate combining medical risk data from NMIHS is only 95.2 percent.

A second problem in the WES II study concerns the relationship between the estimates of nutritional risk for income eligible women and infants. Current WIC regulations state that an infant is automatically deemed at nutritional risk if the mother was at risk during pregnancy. Hence the risk of infants cannot be lower than the risk of pregnant women. Yet the Sigma One methodology has ignored this relationship. In their previous study, the nutritional risk for infants was estimated to be 72 percent, while the risk rate for pregnant women was 91.3 percent. This inconsistency led FNS in 1991 to revise their assumptions for infants to 95 percent. The WES II study estimates do not capture the WIC regulations in this respect.

### **Updating the Nutritional Risk Prevalence Estimates**

It is the panel's view that the estimates of nutritional risk prevalence for the categorically and income eligible WIC population currently in use should be reexamined. The recent efforts to standardize nutritional risk criteria across states and the availability of more recent data motivate a revision of the estimates of nutritional risk eligibility that are currently in use. Standardized anthropometric, medical, and predisposing risk criteria have already been adopted by the states, but they have not been incorporated into the model used to estimate the prevalence of nutritional risk

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<sup>8</sup>An addition for the percentage found to be at dietary risk only (from NHANES III) and adjustments for age criteria that render an applicant nutritionally at risk (under age 18 and over age 36) results in a final estimate of 95.2 percent of income eligible women at nutritional risk.

among income eligible groups. Recommendations concerning dietary risk criteria are to be released soon by the Institute of Medicine, but they will become standard only to the extent that they are adopted by FNS. If newly standardized nutritional risk criteria differ from the modal criteria used in WES II, it is possible that some substantial changes could occur in the proportions of women and children found to be at nutritional risk.

The dietary data used to establish the proportion of WIC income eligible individuals who are also at nutritional risk are outdated. The estimates currently in use were obtained from 1980 data. The WES II estimates, while somewhat more timely, are based on old dietary information as well; their values are derived from data from NHANES III, Phase I carried out during the 1988-1991 period. When new estimates of nutritional risk are developed, investigators should use the most recent suitable datasets. Possible datasets include the Continuing Survey of Food Intakes by Individuals (CSFII), which can provide an additional means of estimating the proportion of individuals at nutritional risk among those who are categorically and income eligible. The most current version is the 1994-1996 survey, with a supplementary survey of children that was implemented in 1998. Phase II of NHANES III, which covers the 1991-1994 period is also available. NHANES IV data covering the period, of 1999-2001 is currently not available but will be within the next few years.

**Recommendation: Estimates of nutritional risk should be reexamined with more recent data and with additional data sources and should take new state standards of nutritional risk into account whenever possible.**

## OVERALL CONCLUSION

This chapter has examined six methodological issues for estimating the number of persons eligible for WIC. The undercount of infants in the CPS results in an undercount of infants and women who are income eligible for WIC. Not fully accounting for adjunctive eligibility results in a substantial undercount of the number of people who are eligible for WIC. The use of annual income instead of monthly income also underestimates the number of people who are eligible for WIC at some point during the year. These three results all point to an undercount of the estimated number of eligible persons. The panel also considered three issues for which the effects of different methodological considerations on the total number of estimated

eligibles were more ambiguous and small in size. Using a 6-month certification period for children instead of the 12-month certification period used currently in estimating eligibility results in an undercount of children of 4 percent if annual income is used, but in a 5 percent overcount if monthly income is used. The use of alternative definitions of the economic unit results in very little change in the total number of estimated eligibles, and the direction of the effect depends on the base with which estimates are being compared. Finally, the panel considered current methods for estimating the percentage of income eligible persons who are at nutritional risk and concluded that these estimates should be reexamined with more recent data.

Considering these findings in total, the panel concludes that current estimation methods result in a substantial understatement of eligible persons.

**Conclusion: The panel concludes that current methods used to estimate eligibility for WIC substantially underestimate the number of people who are eligible.**

The underestimation of eligibility implies that coverage rates are overstated. From the simulation results presented here, the number of infants estimated to be eligible for WIC is underestimated by a total of 54 percent—considering the undercount of infants in the CPS, adjunctive eligibility, and the use of monthly income instead of annual income. The latest coverage rate available for infants is 130.4 percent in 1999. If this rate is recalculated using the increased estimate of eligible infants, the coverage rate falls to 84.7 percent. Presumably the coverage rates of pregnant and postpartum women would also fall similarly. For children, the total underestimation of eligible people is 25 percent (considering an overcount of children in the CPS, adjunctive eligibility, the use of monthly instead of annual income, and a 6-month certification period). The 1999 coverage rate for children was 76.0 percent; when this rate is recalculated with the larger estimate of eligible children, then the coverage rate falls to 60.8 percent. Thus, coverage rates based on the panel's estimates of eligibility would fall considerably if these estimates pass further scrutiny.

It is important to note that the underestimation of eligible people and subsequent overestimation of coverage rates do not necessarily mean that no ineligible persons are participating in WIC. The panel does not explore this possibility, for it is not part of our charge. We do note that the USDA has recently conducted a WIC income verification study and plans to release the results in late 2001.

## Estimates of Full-Funding Participation

Not all of those who are eligible for WIC will participate in the program. Therefore, to estimate full-funding participation, the numbers of people estimated to be eligible are adjusted downward based on estimates of what percentage of eligible persons will participate. Past practice in making this adjustment has been to assume that participation rates for WIC mirror participation rates for the Food Stamp Program for young children. Until recently, the participation rate for this program from the late 1980s was used as a guideline for adjusting the eligibility estimates, meaning that roughly 80 percent of those eligible were estimated to participate. No adjustment is made for differential participation rates among the eligibility categories.

Very little is known about WIC participation, either in a descriptive sense (e.g., trends in participation rates over time and for different populations) or in terms of the behavioral aspects of an individual's decision to participate. It is therefore difficult to justify the use of a single specific adjustment factor for likely participation in the process of estimating annual participation. Assuming that WIC participation rates will be similar to those of the Food Stamp Program is problematic because the two programs are so different. WIC serves those at or below 185 percent of the federal poverty guidelines and those with higher incomes who are adjunctively eligible through Medicaid. The Food Stamp Program serves those who are at or below 130 percent of poverty guidelines. The income verification



process for WIC is not as burdensome as the income verification process for food stamps. WIC does not have an asset test, but the Food Stamp Program does. Citizenship is not a requirement for WIC but it is for the Food Stamp Program. WIC considers only gross income, while the Food Stamp Program also considers net income after certain allowable deductions. WIC and the Food Stamp Program also have very different practices about the length of time a participant is certified as eligible, income verification, and definitions of economic units. Unlike the Food Stamp Program, the WIC program requires that nutritional risk of all applicants be assessed, which is often a lengthy process. WIC program benefits are quite different from food stamp benefits. The total value of food benefits are smaller for WIC.<sup>1</sup> Only specific foods may be purchased with WIC food instruments, while there are very few restrictions on the types of foods that can be purchased with food stamps. The WIC program encourages all participants or their caregivers to have at least two nutrition education contacts during the certification period; the Food Stamp Program does not. It is also likely that WIC participation does not carry the same stigma that food stamp participation does, because WIC has the specific nutritional component that enables a mother to “do the right thing” and provide proper nutrition to her children. Finally, for WIC, each state has a yearly food expenditure goal and must meet at least 97 percent of its food grant or face penalties in the form of reduced funding for the next year. Thus, over the very short run, WIC participation is somewhat constrained. Each of these differences in the eligibility rules, benefit levels, purposes, and possible stigmas of the programs is likely to have differential effects on an individual’s decisions to participate.

**Conclusion:** Use of food stamp participation rates as a proxy for WIC participation rates is inappropriate because the program rules and goals, populations targeted, benefits provided, and public stigmas of these programs are sufficiently different that participation decisions for the program are also likely to be quite different.

**Recommendation:** The panel recommends that alternative methods for estimating WIC participation rates be examined. In addition, fur-

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<sup>1</sup>In fiscal year 1998, the average monthly WIC benefit over all participants was equivalent to \$47 while the average monthly food stamp benefit in fiscal year 1998 was \$165.

**ther research concerning factors that influence the decision to apply for and participate in WIC should be conducted.**

The panel has not had time to fully consider alternative methods but does propose a preliminary alternative. The method applies WIC participation rates from the latest year available to estimates of eligibility for the upcoming year. For example, to estimate participation for 2002, the number of people who participated in WIC from the most recent year with available data, divided by the number of people estimated to be eligible for that year, would be used to adjust the estimates of eligible people for 2002. Since it is likely that participation for each of the eligibility categories varies (e.g., children's participation rates may be lower than infants' participation rates), separate adjustments for each eligibility category should be made. This measure is conceptually easy to grasp and can be constructed with existing data.<sup>2</sup> The merits and drawbacks of this method need to be further explored, and its predictive value should be assessed. Further work could also explore the use of a more sophisticated method that attempts to control for the business cycle or for population composition between the lagged year and the prediction year. But in the short run, the lagged WIC participation rate has promise as an alternative to current practice.

In the long run, the Food and Nutrition Service should sponsor more research on WIC participation decisions and behavior. Program participation modeling studies, such as those that have been conducted for other social welfare programs (Blank and Ruggles, 1994; Currie and Gruber 1996a, 1996b; Moffitt, 1992), could also be applied to the WIC program. Descriptive studies could also be valuable in building a base of knowledge about WIC participation. Studies that explore trends in participation in WIC such as those that are conducted for the Food Stamp Program (see Castner, 2000; and Castner and Cody, 1999, for recent publications on a series of food stamp participation reports) are one example.

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<sup>2</sup>Data for the number of participants could come from the Current Population Survey (CPS) since recent years' Food Security Supplements have asked questions about WIC participation. If used, these numbers should reflect control totals from WIC administrative data to account for underreporting of program participation in the CPS. Other possible sources of data on the number of participants are from financial administrative data the states report to the Food and Nutrition Service or from the most recent WIC Participant and Program Characteristics surveys, which could be used even though these data are produced only every other year.

## 6

# Methodological Issues for Future Consideration

The first phase of the panel's work identified parts of the estimation methodology for which improvements could be made. The panel has not had the time to fully consider what improvements should be made but plans to in Phase II. Possible improvements to four of the methodological issues reviewed in this report will be considered in Phase II. These include consideration of: a weighting scheme for the Current Population Survey (CPS) data that is appropriate for WIC age groupings; methods for estimating the number of people adjunctively eligible for WIC; data and methods for estimating the prevalence of nutritional risk; and methods for estimating the number of people who are eligible for WIC who will participate in WIC.

The number of infants estimated in the CPS is understated compared with yearly Census Bureau population estimates, as Chapter 4 details, because the CPS weights for nonwhite infants are not controlled to population totals for that age group (0 to 1 year). As a result, the number of income eligible infants is probably understated using the CPS, and hence the number of pregnant and postpartum women is also likely to be understated since that number is based on the estimate of the number of income eligible infants. In Phase II, the panel will explore the use of revised weights that are more appropriate for WIC age groupings and other alternative weighting schemes.

The panel concluded in Chapter 4 that accounting for WIC eligibility through TANF, the Food Stamp Program, and Medicaid has a large effect

on estimates of the number of WIC eligible infants and children. Current methods make only a minor adjustment for those who are adjunctively eligible for WIC that does not fully account for all who are eligible for WIC. Thus, the estimates of WIC eligibility are substantially understated. A priority for the panel's Phase II is to explore alternative ways to estimate the number of people who are adjunctively eligible for WIC.

Current methods for adjusting the estimates of the number of income eligible persons for the prevalence of nutritional risk are based on old data about nutritional risk prevalence. More recent estimates have been made, but there are reasons to believe they may be flawed. The panel recommends that estimates of nutritional risk should be reexamined. In Phase II, the panel will consider alternative data and methods for estimating the prevalence of nutritional risk.

The panel reviewed current methods for estimating the number of income eligible persons who would participate in WIC. We conclude that the current method of using food stamp participation rates as a proxy for WIC participation is problematic and that new methods should be considered. A priority for Phase II is to more fully consider different methods to estimate participation in the WIC program.

The panel plans to explore a number of new topics in Phase II: use of alternative datasets for the core estimates, estimating eligibility in the U.S. territories, methods for estimating eligible pregnant women, and methods for estimating breastfeeding rates in order to estimate the number of eligible postpartum women.

### **ALTERNATIVE DATASETS FOR ESTIMATING INCOME ELIGIBILITY**

The March Income Supplement of the CPS is currently used to estimate the core number of persons who are income eligible for the WIC program. However, other data sets have certain features that may make them better-suited for estimating WIC eligibility. The Survey of Income and Program Participation (SIPP) is the primary example, since it collects monthly income data and monthly data on demographic and household composition. The panel will extend the work of the Food and Nutrition Service (FNS) publication (U.S. Department of Agriculture, 1999a) regarding the strengths and limitations of the CPS and the SIPP for WIC eligibility estimation purposes.

An alternative strategy for obtaining WIC eligibility estimates may be

to add supplements or single questions (for example, a question on WIC participation) to the March CPS that would provide information needed to estimate the various components of eligibility for WIC. Another alternative strategy may be to conduct a small special-purpose survey to collect data needed to assess WIC eligibility. Phase II of the panel will consider such alternative sources of data.

### **ESTIMATES OF THE NUMBER OF ELIGIBLE PEOPLE IN THE TERRITORIES**

To estimate the number of income eligible infants and children residing in the U.S. territories of American Samoa, Guam, Puerto Rico, and the American Virgin Islands who are eligible to receive WIC, FNS employs a constant multiplier of 1.0388 to adjust the estimates derived from the CPS, since the CPS universe does not include the territories. This proportional adjustment was estimated from the 1990 census. During the second phase of the panel's work, we intend to examine the validity of this assumption by examining the historical trends in enrollment in WIC in the United States versus the territories over the 1990s.

### **ESTIMATION OF ELIGIBLE PREGNANT WOMEN**

FNS estimates the number of income eligible pregnant women based on the number of income eligible infants. The only adjustment that is made to the number of infants is to multiply the count by 0.75. This assumes that the number of income eligible infants in 9 months of a year is equal to three-quarters of the number of income eligible infants in one year and that the number of income eligible pregnant mothers is exactly the number of income eligible infants in a 9-month period. Although a pregnant woman is eligible as soon as she is pregnant, there is usually a delay between the time a mother conceives and the time she realizes she is pregnant, and also a lag between the time a woman finds out she is pregnant and the time she decides to apply for WIC. The current methodology does not take either of these lags into account. Use of this assumption may result in an overstatement of the number of pregnant women who participate in WIC, although technically not the number who are eligible for WIC.

The estimation methodology also assumes that the number of infant deaths and the number of multiple births cancel each other out (although

the estimates of postpartum women do adjust for multiple births and infant deaths). Using the counts of infants to count pregnant women without accounting for infant deaths would understate the number of pregnant women. The presence of multiple births would overstate the number of women. Estimates from the late 1980s in the second WIC Evaluation Study indicate that multiple births may be more common than infant deaths (U.S. Department of Agriculture, 1987). The panel has not, however, reviewed this study nor data about infant deaths and multiple births to assess the appropriateness of this assumption.

The method for estimating income eligible pregnant women also assumes that income during pregnancy is similar to income after the birth of a child, as we discussed above. It also assumes that birth rates do not change over the time frame between when the estimates of infants are made and the 9 months prior to that. Finally, the census definition of families used by the CPS does not count cohabitating partners of pregnant women as part of the family unit until the baby is born. If, in assessing the eligibility of families, WIC staff workers do count cohabitating partners as part of the family unit, a bias in the CPS estimates of eligible pregnant women could be created. Further explorations into these methodological assumptions will be conducted in Phase II.

### **ESTIMATION OF ELIGIBLE POSTPARTUM WOMEN**

Estimates of the number of income eligible postpartum women are also based on the estimates of the number of income eligible infants, plus an adjustment to account for the percentage of postpartum women who breastfeed their infants and the duration of breastfeeding. Although the panel has not thoroughly examined methods used in these estimations, some methodological and data issues deserve further attention.

The accuracy of adjustments to account for the rate and duration of breastfeeding among low-income mothers is one such issue. The National Maternal and Infant Health Survey (NMIHS) data, which are used to estimate breastfeeding rates and duration, are 13 years old, and some evidence indicates that breastfeeding rates have increased since then. Data from the Ross Laboratories Mothers Survey indicates that breastfeeding rates in the U.S. population have increased from 54.2 percent in 1988 to 68.4 percent in 2000 for mothers in the hospital after delivery of their child and from 19.5 percent in 1988 to 31.4 percent in 2000 for women 6 months after

the birth of their child (Smith, 2001).<sup>1</sup> Changes in breastfeeding rates for low-income groups have historically lagged behind those of higher income groups (see U.S. Department of Agriculture, 1992, for a summary of historical breastfeeding practices), and we do not know whether breastfeeding rates among low-income groups have increased over recent years as much as rates in the total population have. Results from the Ross Laboratories Mothers Survey should be corroborated with data from other sources, which do not provide trends in breastfeeding but do give point-in-time estimates that are fairly recent, such as the National Health and Nutrition Examination Survey (NHANES III), the National Survey of Family Growth, the Continuing Survey of Food Intakes by Individuals, the Early Childhood Longitudinal Study Birth Cohort 2000, and the Infant Feeding Practice Survey. These datasets also include measures of family income, which the Ross Laboratories Mothers Survey data do not include. The panel has not reviewed the methods and assumptions used in the FNS life table estimates of the probability of breastfeeding over time. In our further review, we will consider these.

### **CONFIDENCE INTERVALS FOR ELIGIBILITY ESTIMATES**

Sampling variability and random errors in reporting of income can create uncertainty in the estimates apart from the systematic biases that have been examined in this report. In the second phase of the study, the panel will investigate the appropriate level of confidence to place in the estimates by examining standard errors of the estimates of eligibility.

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<sup>1</sup>Breastfeeding here is defined as any, but not necessarily exclusive, breastfeeding. These estimates do not adjust for age or income.

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# APPENDIX A

## Glossary

Adjunctive Eligibility	Any individual who is categorically eligible and is receiving or is certified to receive either cash assistance (Temporary Assistance for Needy Families), food stamps, or Medicaid. In general, proof of certification in these programs is sufficient for verifying income eligibility for WIC. In some states, proof of certification in other transfer programs (e.g., Free and Reduced Price School Lunch, Low Income Energy Assistance) is sufficient for verifying income eligibility for WIC also.
Categorical Eligibility	To be eligible for WIC benefits, the individual must be: (1) a women who is pregnant; (2) a woman who is breastfeeding her infant and is less than 12 months postpartum; (3) a woman who is not breastfeeding her infant and is less than 6 months postpartum; 4) a child less than 5 years old; or (5) an infant less than 1 year old.
Certification Period	The time period for which a fully eligible person is approved to receive WIC benefits. In general, infants can be certified for an entire year, preg-

	<p>nant women can be certified from the time they become pregnant until 6 weeks postpartum, and both children and postpartum women are certified for 6-month periods.</p>
Core Estimates of Eligibility	<p>The estimated number of income eligible infants and children. The core estimates of infants are used as the basis to estimate the number of income eligible pregnant and postpartum women.</p>
Coverage Rate	<p>The average monthly number of persons issued WIC food instruments in a calendar year (from administrative records) divided by the estimated number of individuals fully eligible for WIC in the same calendar year.</p>
Economic Unit or Family	<p>WIC program rules define the economic unit as a group of related or nonrelated individuals who are living together as one economic unit. The WIC eligibility estimates currently use the Census Bureau's definition of the family to define the economic unit, which is defined as all persons related by blood or marriage who live together.</p>
Food Instrument	<p>A voucher or check that can be exchanged for food in a participating retail grocery store. The food instrument lists the quantities of specific foods, including brand names, that can be purchased at the authorized vendor. Food instruments vary according to the participant's eligibility category.</p>
Full Eligibility	<p>Any individual who meets both income eligibility requirements and is assessed to be nutritionally at risk</p>
Full-Funding Participation	<p>The number of fully eligible individuals who wish to participate given the current budget for administering the WIC Program.</p>

Income Eligibility	Any individual who is categorically eligible and is either adjunctively eligible or has income less than 185 percent of poverty, defined by federal guidelines according to family size.
Nutritionally at Risk	Any individual assessed by a competent professional with a condition that puts them at risk for poor nutritional conditions. There are five broad nutritional risk criteria: (1) anthropometric risk (e.g., height and weight); (2) biochemical risk (e.g., low hematocrit); (3) medical risk (e.g., diabetes mellitus); (4) dietary risk (e.g., inappropriate dietary patterns); and (5) predisposing nutritional risk factors (e.g., homelessness).
Poverty Line	Department of Health and Human Services poverty guidelines, which depend on family size alone.
Prediction Error Rate	The percentage difference between the estimated number of full-funding participants and the actual number of reported participants in a given year.

## APPENDIX B

# Meeting and Workshop Agendas

### First Panel Meeting

December 8, 2000  
Room 130  
Green Building  
2001 Wisconsin Avenue, NW  
Washington, DC

### AGENDA

#### **Friday, December 8**

#### *OPEN SESSION*

10:45 Coffee and refreshments available

11:00 Welcome and Introductions      David Betson, Panel Chair  
Barbara Torrey, Executive  
Director, CBASSE  
Andy White, Director,  
CNSTAT

- |       |  |   |
|-------|--|---|
| 11:15 | The Charge to the Panel  | Cindy Long, Branch Chief,<br>Special Nutrition Staff,<br>Office of Analysis<br>Nutrition and Evaluation,<br>Food and Nutrition<br>Service, USDA |
| 11:45 | Overview of the WIC Program  | Debbie Whitford, Branch<br>Chief, WIC Program &<br>Policy Development,<br>Supplemental Food<br>Programs Division, FNS                           |
| 12:30 | Lunch, Refectory   |   |
| 1:45  | Methodology for Estimating<br>WIC Eligibility and<br>Participation and Estimation<br>Issues for Review | Cindy Long, Food and<br>Nutrition Service<br>Anne Gordon,<br>Mathematica Policy<br>Research   |
| 3:00  | Coffee Break   |   |
| 3:15  | Other Viewpoints Concerning<br>WIC Eligibility Estimates   | Robert Greenstein<br>Leighton Ku<br>Center on Budget and<br>Policy Priorities   |
| 4:00  | Open Discussion Period   |   |
| 4:45  | Reception, Green Building<br>North Lounge  |   |



Second Panel Meeting

March 15-16, 2001  
 Holiday Inn of Georgetown  
 2101 Wisconsin Avenue, NW  
 Washington, DC

**AGENDA**

**Thursday, March 15**

- 8:30 Continental Breakfast
- 9:00 Welcome and Introductions      David Betson, Panel Chair  
    Andrew White, Director,  
    Committee on National  
    Statistics
- 9:15    Session I      Estimating the Number of  
    Infants and Children with  
    the CPS and SIPP
- Chair:      David Betson  
                                  Presenter:      Gregory Spencer, Chief, Population Projections  
    Branch, Census Bureau
- 10:30 Break
- 10:45    Session II      Income Variability, Adjunct Eligibility, Data  
    Timeliness and Estimates of the Number of  
    Income Eligible Infants and Children
- Chair:      Karl Scholz, Panel Member  
                                  Presenter:      Linda Giannarelli, Urban Institute
- 12:15 Lunch

1:30 Session III Recent Trends in Breast Feeding Rates

Chair: Julie DaVanzo, Panel Member

Presenter: Booker Smith, Ross Laboratories

2:30 Break

2:45 Session IV Nutritional Risk Estimates

Chair: Alicia Carriquiry, Panel Member

Presenter: Marie Louise Harrell, Sigma One Corporation

3:45 Open Discussion Time

4:30 Adjourn

**Friday, March 16**

8:30 Continental Breakfast

9:00 Session V WIC Office Administration and Program  
Participation: A Panel Discussion with State  
WIC Directors

Moderator: Carol Suitor, Panel Member

Roundtable

Participants: Phyllis Bramson-Paul, California Department of  
Primary Care and Family Health  
Alice Lenihan, North Carolina WIC Program  
Frank Maisano, Pennsylvania Department of  
Health  
Peggy Trouba, Nebraska Health and Human  
Services

10:30 Break

- 10:45 Session VI Food Stamps, Medicaid and WIC Participation and Implications for Estimating WIC Participation

Moderator: Janet Currie, Panel Member

Session Topics and Participants:

Food Stamps Participation	Carole Trippe and Allen Schirm, Mathematica Policy Research
Medicaid Participation	Jenny Kenney and Lisa Dubay, The Urban Institute
WIC Participation	Michael Brien, University of Virginia

Roundtable discussion of the implications for WIC participation

- 12:30 Lunch

- 1:30 Session VII Administrative Data Collected through the WIC Program

Chair: Paul Buescher, Panel Member

Presenter: Julie Kresge, Food and Nutrition Service

- 2:15 Session VIII Workshop Summary and Open Discussion Time

Chair: David Betson, Panel Chair

- 3:00 Adjourn

## APPENDIX C

# March Current Population Survey Income Supplement

The Current Population Survey (CPS) is a voluntary survey of monthly labor force participation, begun in the 1940s, that includes supplemental questions in many months, including the annual March income supplement, which is used to estimate WIC eligibility. The March CPS asks household respondents about income received during the previous calendar year from the following sources: earnings, unemployment compensation, workers' compensation, Social Security, Supplemental Security Income, public assistance, veterans' payments, survivor benefits, disability benefits, pension or retirement income, interest, dividends, rents, royalties, and estates and trusts, educational assistance, alimony, child support, financial assistance from outside the household, and other income. While income data are reported for the previous calendar year, it is important to note that demographic and household membership data are reported as of the date of the survey. Thus, income information reported in the survey might not reflect the income of all the members of the household at the time of the survey because the composition of the household might change between the period for which income is measured and the period for which demographic and household membership data are measured. The March CPS Supplement does not ask questions about WIC participation; however, a separate CPS supplement, the Food Security Supplement, which has been conducted every year since 1995 (in a month other than March), includes questions about WIC participation of sampled households. The March

CPS Supplement is the input dataset for the Transfer Income Microsimulation (TRIM) model discussed in Appendix D.

The monthly CPS sample includes about 50,000 households, or 1 in 2,000 of all U.S. households. The monthly CPS has a rotating panel design, under which each sampled address is in the survey for 4 months, out of the survey for 8 months, and in the survey for another 4 months. Three-fourths of the sample addresses are common from one month to the next, and one-half are common for the same month a year earlier. The sample for the March CPS Supplement consists of the basic monthly CPS sample and an additional sample of Hispanic households.

The CPS uses a multistage probability sample design, which is revised after each decennial census. The CPS has a state representative design, which results in larger states generally having larger CPS sample sizes, but with the largest states having CPS sample sizes that are smaller than their proportionate share of the U.S. population and the smallest states having proportionately larger sample sizes. In fall 1999 the Census Bureau received an appropriation to adjust the March CPS sample size and design so that reliable annual estimates at the state level could be provided of the numbers of low-income children lacking health insurance coverage by family income, age, and race or ethnicity.

Data collection for the CPS is carried out by permanent, experienced interviewers. The first and fifth interviews at an address are usually conducted in person; the other six interviews at an address are usually conducted by telephone. One household member who is age 15 or older is allowed to respond for other members.

Like other household surveys, the CPS exhibits population undercoverage at higher rates than the census. For March 1994, the ratio of the CPS estimated population to the census-based population control total (all ages) was 92 percent; for black men age 30-44 years, the coverage ratios were as low as 67-68 percent in 1994 (U.S. Census Bureau, 1996:Table D-2). It is estimated that about two-thirds of CPS undercoverage is due to missed people in otherwise interviewed households (i.e., people whose existence, let alone any information about them, is not known to the interviewer); the remainder is due to missed housing units because the address was not included in the sampling frame. CPS undercoverage is corrected by ratio adjustments to the survey weights that bring the CPS estimates of population in line with updated national population controls by age, race, sex, and Hispanic origin. Beginning with the March 1994 CPS, the population controls for survey weights reflect an adjustment for the undercount in the

census itself. However, the ratio adjustments do not correct for other characteristics, such as income, on which the undercovered population might be expected to differ from the covered population in each adjustment cell.

There is substantial item nonresponse in the March income supplement. Household income is one such item for which nonresponse is substantial. Imputation techniques are used to provide values for people who fail to respond to the income supplement entirely, as well as for people who fail to answer one or more questions on the supplement.

Additional information can be found at the Census Bureau web site for the CPS (<http://www.bls.census.gov/cps/ads/adsmain.htm>).

## APPENDIX D

# The TRIM3 Microsimulation Model

*Linda Giannarelli, Paul Johnson,  
Joyce Morton, and Laura Wheaton  
Urban Institute*

Estimates of the number of children who are income eligible for WIC presented in this report were derived from the Transfer Income Model version 3 (TRIM3) microsimulation model using data from the March 1999 Current Population Survey (CPS). Microsimulation models like TRIM3 use database records on individuals and families to simulate the effects of complex, large-scale governmental tax, transfer, and health programs at the individual, family, state, and national levels. The TRIM3 model and its predecessors have been used by analysts to understand the potential outcomes of such public policy changes as welfare reform, tax reform, and national health care reform since the 1960s.

Microsimulation models operate on individual units rather than aggregate information. In the case of WIC and other social welfare programs, those units are typically individual economic units, such as a family—however the program defines it—or an individual. The database used as input to a microsimulation model contains records describing persons, households, or businesses. The simulation model applies a set of rules to each individual record in the database and simulates eligibility or the dollar amount of benefits to which the unit is entitled under a government program or the amount of taxes owed by the unit. The weighted individual results are then added together to obtain the aggregate result.

For example, microsimulation models may be used to estimate tax liability for proposed changes to federal income tax rules. To simulate total

tax liability, the model would use individual records on families from the input database and apply the detailed federal tax rules to each family in the database. In effect, the program fills out the tax forms for each family. TRIM3 counts dependents, adds up income, subtracts adjustments to income, subtracts the larger of itemized or standard deductions, subtracts personal exemptions, computes taxes on available income, and computes and subtracts tax credits to arrive at the final tax liability for each family. To obtain aggregate tax liability, each family's tax liability is multiplied by its weight and then added to obtain the total.

In some cases, the primary input database for a microsimulation model may not exactly match the data needed to simulate the policy. For estimating eligibility and participation in transfer programs, monthly income is typically needed to simulate the income eligibility provisions of the programs. However, the March CPS data provide only annual income data. The TRIM3 model includes a procedure to estimate monthly income from annual income reports. Further, since people tend to underreport their participation in transfer programs in surveys like the CPS, the TRIM3 model makes adjustments to account for this underreporting using control totals from administrative records from transfer programs.

This appendix briefly presents the history and current capabilities of TRIM3. The remaining sections cover the two aspects of TRIM3 used most directly in the analyses in this report: (1) the allocation of reported annual income amounts across the months of the year and (2) the simulation of transfer program eligibility and receipt.

### HISTORY AND CAPABILITIES OF TRIM3

TRIM3 has been developed at the Urban Institute with funding from the U.S. Department of Health and Human Services (DHHS) and other government and private funders. TRIM3 is a descendant of the first microsimulation model ever developed—the Reforms in Income Maintenance (RIM) model first developed in 1969 by members of the President's Commission on Income Maintenance Programs. RIM was followed by the first TRIM model, which was operational in 1973, and by TRIM2, which was operational in 1980. The goals of TRIM and TRIM2 were to make the system increasingly comprehensive, flexible, self-documenting, and useful for quick-turnaround policy simulations of tax and transfer policies.

In 1995, the assistant secretary for planning and evaluation (ASPE) of DHHS began funding the development of TRIM3. This latest version of



TRIM grounds the simulation model on a computation platform that takes advantage of relatively recent advances in information technology, such as the rise of PCs, windowed user interfaces, client/server systems, open relational databases, object-oriented programming, and the Internet. TRIM3 was introduced in 1997 and is currently being used by researchers at the Urban Institute, DHHS-ASPE, and the Office of Management and Budget (OMB).

TRIM3 can be used to model the following U.S. tax and transfer programs:

Cash and in-kind transfer programs:

- Supplemental Security Income (SSI)
- Temporary Assistance to Needy Families (TANF)
- Food Stamp Program
- Child care subsidies (eligibility for subsidies and amount of potential copayment)
- Public housing and subsidized housing programs (value of subsidy)

Health insurance programs

- Medicare
- Medicaid and S-CHIP
- Employer-sponsored health insurance

Tax programs:

- Payroll taxes
- Federal income taxes
- State income taxes

TRIM3 is uniquely qualified to estimate WIC eligibility because it can simulate eligibility and participation in Medicaid. This capability of TRIM3 is why it was chosen to make the estimations of WIC eligibility in this report.

### **THE ALLOCATION OF REPORTED MONTHLY INCOME AMOUNTS ACROSS THE MONTHS OF THE YEAR**

To simulate the number of people adjunctively eligible for WIC through other transfer programs, TRIM3 requires monthly rather than annual income amounts. However, the March CPS file asks respondents

about annual income from various sources. To estimate monthly income, the TRIM3 system takes the annual income amounts for each person and “allocates” them across the months of the year. The exact procedures for this allocation vary by type of income and are most detailed for earnings. The following sections explain how monthly income totals from various sources are generated by TRIM3.

### **Weeks of Work and Unemployment**

The monthly allocations for earnings and some types of unearned income are based on the estimated distribution of weeks worked and/or weeks unemployed across the months of the year. CPS respondents report several items of information that are used to make these allocations: the number of weeks of employment, the number of employers during the year, the number of weeks of unemployment (looking for work), and the number of stretches of looking for work. TRIM3 allocates the reported weeks of work and/or the reported weeks of unemployment across the months in a way that is consistent with the other reported information. For example, if a person reports 26 weeks of work, 26 weeks of unemployment, and 1 stretch of unemployment, then all the weeks of unemployment will be placed consecutively. The exact placement of the weeks (for instance, whether to start the 26 weeks of unemployment in January, July, or somewhere in between) is largely random. However, the procedure is controlled so that monthly unemployment rates generated from the TRIM3 CPS-based estimates have the same *trend* over the year (although not necessarily the same exact levels) as the actual unemployment rates reported by the Bureau of Labor Statistics from the monthly CPS.

### **Earnings**

Once the weeks of employment and unemployment have been allocated across the year, TRIM3 uses this information to allocate earnings across the weeks of employment. All the combined reported annual earned income—wages, farm income, and self-employment nonfarm income—is allocated evenly across the weeks of employment during the year. Thus, if a person reported working all 52 weeks, the earnings will be distributed evenly across those weeks. If a person reported working all 26 weeks, the earnings will be distributed evenly over those weeks.

### **Unemployment Compensation**

In general, annual unemployment compensation income is divided evenly across weeks of unemployment. However, for a randomly-selected 51 percent of the annual unemployment compensation recipients, the monthly amounts are lagged by one month to capture real-world delays in receipt of unemployment compensation relative to the start of a spell of unemployment. The percentage is based on data from the Survey of Income and Program Participation (SIPP).

### **Workers' Compensation**

Allocation of annual workers' compensation income across months of the year depends upon how much compensation the individual unit reports receiving. If the unit reports receiving more than \$7,800 (for the 1998 reporting year) it is assumed that the unit received compensation throughout the year and workers' compensation income is divided evenly across the months of the year. If it is less than that amount, the assumption is that it was not received in every month. In that case, 20 percent of recipients are randomly selected to receive the workers' compensation in one month, and the remaining 80 percent have their workers' compensation income divided evenly over weeks of non-work (either unemployed or not in the labor force). These percentages were calculated from SIPP data which include monthly reports on workers' compensation receipt. The \$7,800 threshold for determining whether workers' compensation income is divided evenly across the months of the year or not was originally based on SIPP data of monthly workers' compensation totaled across the year, and has since been updated for inflation.

### **Child Support and Alimony**

Annual income amounts from child support and alimony are allocated across the months of the year based on patterns of receipt of income from these sources as reported in SIPP. SIPP data were used to develop "look-up" tables that give, for different ranges of combined annual alimony and child support income, the percentage of recipients getting that income in 1 month, 2 months, 3 months. . . 12 months. These tables are used to guide how an individual unit's annual report of child support and alimony income is allocated across the year, depending upon which range of com-

bined child support and alimony the unit falls into. For each recipient, TRIM uses random numbers to pick a number of months of receipt of child support and alimony, and then uses random numbers to assign those months within the year (not necessarily consecutively). The assignments are made such that the resulting percentage distributions of recipients by months of receipt match the percentages in the look-up table. Once each unit is assigned months of the year for child support and alimony receipt, their annual incomes from these sources are divided evenly across these months.

### **Allocating Asset Income**

All types of asset income—interest, dividends, and rent—are divided evenly across the months of the year.

### **Allocating Other Unearned Income**

All other income amounts—including Social Security and Railroad Retirement, government pensions, private pensions, veterans' benefits, "other" income, and contributions—are assumed to be received in 12 equal monthly amounts.

## **SIMULATING ELIGIBILITY AND RECEIPT OF TRANSFER PROGRAM BENEFITS**

Simulation estimates made in this report require information on both the amount of income received from transfer programs (to determine a unit's total income) and eligibility and participation in these programs (to determine if a unit is adjunctively eligible for WIC). The estimates made in this report involved simulations of three different transfer programs: TANE, the Food Stamp Program, and Medicaid (including State Children's Health Insurance Programs (S-CHIP) funded Medicaid expansions).<sup>1</sup> For each of these programs, TRIM3 simulates eligibility, participation, and levels of benefits received. Results of the simulations are saved as new

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<sup>1</sup>Indirectly, simulations of SSI and housing subsidies were also involved. The SSI results are used as input to the TANE, Food Stamp Program, and Medicaid simulations. The results of the housing subsidy model are used by the Food Stamp Program simulation.

variables on the data records, augmenting the CPS-reported information. One benefit of a comprehensive model like TRIM3 is that simulated variables can be “passed” from one part of the simulation to the next. In this case, the results of the TANF simulation are used by the FSP and Medicaid simulations.

### Eligibility Simulations

The eligibility simulations are very detailed and attempt to mimic how eligibility rules would apply to the units in the CPS if they actually sought program assistance. Demographic tests (including immigrant-status tests<sup>2</sup>), asset tests,<sup>3</sup> and income tests are applied to the extent possible given the information available in the CPS data. If a program’s rules vary by state, the rules that are applied to a particular household are the rules in effect in that household’s state of residence. The TRIM3 simulations refer to a detailed database on program rules in each state, for each year and each program. The detailed TANF rules are based on the information in the Urban Institute’s Welfare Rules Database,<sup>4</sup> which is derived from review of each state’s caseworker manuals and/or regulations. The Medicaid rules capture the real-world state-specific variation in rules such as the percent-of-poverty thresholds and medically needy income thresholds. They also capture the difference between the S-CHIP-funded Medicaid expansions and the separate state S-CHIP programs. People who enrolled in S-CHIP-funded Medicaid expansions are adjunctively eligible for WIC but those who enrolled in separate state S-CHIP-funded programs are not, unless they are otherwise income eligible.

Each simulation uses the “filing unit” that is most appropriate to that particular program. The filing unit is the group of people who together would file for and potentially receive the benefit. For TANF, the filing unit is a narrowly defined family, with subfamilies treated separately from the primary family. In the Food Stamp Program, the filing unit may be the entire household or it may be smaller, particularly when a broader house-

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<sup>2</sup>The CPS includes data on citizenship and nativity but does not include immigrant legal status. Legal status is imputed through complex procedures that hit targets for legal versus illegal immigrants, based on demographic and employment characteristics.

<sup>3</sup>Vehicle assets tests are not modeled, because there is no CPS variable for the value of a vehicle, and no imputation has yet been incorporated into TRIM3 to create such a variable.

<sup>4</sup>The Welfare Rules Database is available on line at <[newfederalism.urban.org/wrd](http://newfederalism.urban.org/wrd)>.

hold includes an AFDC/TANF unit. For Medicaid, the filing unit may be either a family or an individual.

Eligibility simulations are performed on a month-by-month basis. Thus, a family might be eligible for a program in one month but not another, or eligible for a different amount in one month than another. Note, however, that only one set of rules is stored in the database for each year. The rules used for each year are the rules in effect for the majority of that year.

For additional details about simulating eligibility for the transfer programs, see the TRIM3 web site at <[trim3.urban.org](http://trim3.urban.org)>.

### **Modeling the Participation Decision**

For each transfer program, TRIM3 determines whether a particular filing unit that is eligible for that program will in fact apply for and receive the benefits from that program. The CPS respondents do report whether the household received food stamps or TANF and whether any of the members were enrolled in Medicaid (again, these reports are on an annual basis). However, there is serious underreporting of transfer program benefits (Wheaton and Giannarelli, 2000). The public-use CPS captures only about 61 percent of the 1998 TANF caseload, 67 percent of the Food Stamp Program caseload, and 68 percent of the Medicaid caseload. The TRIM3 simulation corrects for this underreporting of transfer benefits.

Participation methodologies vary somewhat among the simulated programs, but several general methods apply to all programs. Units that are eligible for assistance and report receiving assistance on the CPS are assigned to participate. Note that responses that were “allocated” (imputed) by the Census Bureau are not considered to be actual reports. Units that are simulated to be ineligible for assistance are not assigned to participate, even if they report receiving that assistance according to the CPS data. Additional eligible nonreporters are selected to participate in such a way that the simulated caseload matches the caseload reported from administrative records as closely as possible in terms of size as well as key characteristics—typically unit type, benefit level, citizenship status, and state. Thus, the final TRIM3 version of the CPS data corrects for the under-reporting of transfer benefits.

For additional details about how TRIM3 models participation for each of the transfer programs, see the project’s web site at <[trim3.urban.org](http://trim3.urban.org)>.

## APPENDIX E

### Biographical Sketches of Panel Members and Staff

DAVID M. BETSON (*Chair*) is an associate professor of economics at the University of Notre Dame. His previous positions have been as a visiting scholar at the Joint Center for Poverty Research of the University of Chicago and Northwestern University, a research associate at the Institute for Research on Poverty at the University of Wisconsin, and an economist in the Office of the Assistant Secretary for Planning and Evaluation in the U.S. Department of Health, Education, and Welfare. His research examines the effects of governments on the distribution of economic well-being with special reference to the measurement of poverty and the analysis of child support policy. He received a Ph.D. degree in economics from the University of Wisconsin–Madison.

PAUL BUESCHER is the head of the Statistical Services Branch of the State Center for Health Statistics in North Carolina. He oversees branch activities including the production, editing, and analysis of vital statistics data files; analyses of Medicaid, hospital discharge, and county health department patient data files; and publication of many annual reports and special studies of the Center. He serves as project director for both the Centers for Disease Control and Prevention (CDC) Pregnancy Risk Assessment Monitoring System (PRAMS) and the CDC Behavioral Risk Factor Surveillance System (BRFSS) in North Carolina. He is adjunct associate professor in the Department of Maternal and Child Health of the University of North Carolina School of Public Health and works with university colleagues to promote

collaborative research agendas. He received a Ph.D. in sociology and demography from the University of North Carolina at Chapel Hill.

ALICIA CARRIQUIRY is an associate professor of statistics at Iowa State University. She specializes in linear models, Bayesian statistics, and general methods. Her recent research focuses on nutrition and dietary assessment. She is on the Editorial Board of *Bayesian Statistics* and an editor for *Statistical Science*. She is currently a member of the Committee on Uses and Interpretations of Dietary Reference Intakes at the Institute of Medicine. She has been elected a Fellow of the American Statistical Association and is an elected member of the International Statistical Institute. She received a Ph.D. in statistics and animal science from Iowa State University.

CONSTANCE F. CITRO is a senior program officer for the Committee on National Statistics. She is a former vice president and deputy director of Mathematica Policy Research, Inc., and was an American Statistical Association/National Science Foundation research fellow at the U.S. Census Bureau. For the committee, she has served as study director for numerous projects, including the Panel on Poverty and Family Assistance, the Panel to Evaluate the Survey of Income and Program Participation, the Panel to Evaluate Microsimulation Models for Social Welfare Programs, and the Panel on Decennial Census Methodology. Her research has focused on the quality and accessibility of large, complex microdata files, as well as analysis related to income and poverty measurement. She is a fellow of the American Statistical Association. She received a B.A. degree from the University of Rochester and M.A. and Ph.D. degrees in political science from Yale University.

JANET CURRIE is a professor of economics at the University of California, Los Angeles. She was at the Massachusetts Institute of Technology as an assistant and then associate professor. Her recent work focuses on the effects of welfare programs on poor children. In particular, she has studied the Head Start program and Medicaid. She is a consultant with the Labor and Population group at RAND; a research associate at the National Bureau of Economic Research; and a faculty associate at the Chicago/Northwestern Poverty Center. She is an editor of the *Journal of Labor Economics* and on the editorial board of the *Quarterly Journal of Economics* and the *Journal of Health Economics*. She received a Ph.D. in economics from Princeton University.



JULIE DaVANZO is an economist/demographer who is a senior economist at RAND, where she directs the Center for the Study of the Family in Economic Development and its Population Matters project (whose purpose is to disseminate the policy-relevant findings of population research). She has served as a member of the National Research Council's Committee on Population and as a member of the Population Research Committee of the National Institute of Child Health and Human Development. She is currently a member of the Committee on National Statistics. She has designed and directed the Malaysian Family Life Surveys (1976, 1988, 2001), a widely used database for the study of demographic and health issues in developing countries. She has also done research on infant feeding, both in the United States and in several developing countries. She received M.A. and Ph.D. degrees in economics from the University of California, Los Angeles.

JOHN F. GEWEKE is the Harlan McGregor chair in economic theory at the University of Iowa. He is also a professor of economics and statistics at the University of Iowa. Formerly he was a professor in the Department of Economics at the University of Minnesota and adviser to the Federal Reserve Bank of Minneapolis. He was the director of the Institute of Statistics and Decision Sciences at Duke University and professor in the Department of Economics at the University of Wisconsin. He is currently a member of the National Research Council's (NRC) Division of Behavioral and Social Sciences and Education and is a former member of the NRC's Committee on National Statistics and the Panel on the Demographic and Economic Impacts of Immigration. He is a fellow of the Econometric Society and the American Statistical Association. His research has included time series and Bayesian econometric methods, with applications in macroeconomics and labor economics. He has a B.S. from Michigan State University and a Ph.D. in economics from the University of Minnesota.

DAVID GREENBERG is a professor of economics at the University of Maryland, Baltimore County. He is a member of the American Economic Association, the Industrial Relations Research Association, and the Association for Public Policy and Management. He is also a Research Affiliate of the Institute for Research on Poverty at the University of Wisconsin. He has been a Research Fellow at the Centre for Research in Social Policy at Loughborough University. He has served on advisory panels for several different federally funded research projects including a special U.S. General

Accounting Office Advisory Panel on Computer Matching Cost-Effectiveness Methodology and a Maryland Expert Panel on Drug Abuse Benefits. He has consulted widely for both public- and private-sector organizations and regularly serves as a referee for various academic journals. He received a Ph.D. in economics from Massachusetts Institute of Technology.

ROBERT P. INMAN is the Miller-Sherrerd Professor of finance and economics at the Wharton School of the University of Pennsylvania and a professor of economics and law at the Law School of the University of Pennsylvania. In addition to his appointment as a professor at the Wharton School, he currently serves as a senior fellow of the Leonard Davis Institute of Health Economics, University of Pennsylvania, as a research associate of the National Bureau of Economic Research, Cambridge, Massachusetts, and as a fellow of the Center of Fiscal and Monetary Affairs, part of the Government of Japan. He is an associate editor of two professional research journals, *Public Finance Quarterly* and *Regional Science and Urban Economics*. His research has focused on the design and impact of fiscal policies. He was elected a fellow of the Center for the Advanced Study in the Behavioral Sciences (Stanford, CA; 1992-1993) and the Fulbright professor of economics (2000) at the European University Institute. He received a Ph.D. in economics from Harvard University.

JAMES LEPKOWSKI is a senior research scientist at the Institute for Social Research and an associate professor of biostatistics at the University of Michigan. He is also a research professor in the Joint Program in Survey Methodology at the University of Maryland. He currently directs the University of Michigan's Summer Institute in Survey Research Techniques, while continuing to conduct a variety of survey methodology research. He designs and analyzes a variety of survey samples, including area probability and telephone samples of households in the United States and in developing countries. He actively consults on sample designs for surveys in Africa, Asia, and Europe. The substantive content of most of this work has been health or social conditions, including those that occur infrequently in the population. He received a B.S. in mathematics from Illinois State University and a Ph.D. in biostatistics from the University of Michigan.

JOHN KARL SCHOLZ is a professor of economics and director of the Institute for Research on Poverty at the University of Wisconsin, Madison. In 1997-1998 he was the deputy assistant secretary for tax analysis at the

U.S. Department of the Treasury, and from 1990-1991 he was a senior staff economist at the Council of Economic Advisors. He has written extensively on the earned income tax credit and low-wage labor markets. He also writes on public policy and household saving, charitable contributions, and bankruptcy laws. He is a research associate at the National Bureau of Economic Research. He received a Ph.D. in economics from Stanford University.

CAROL WEST SUITOR is a nutrition consultant working out of Northfield, Vermont. Currently, she is assisting the March of Dimes' Task Force for Nutrition and Optimal Human Development. Recently, she assisted the year 2000 Dietary Guidelines Advisory Committee; studied school children's diets in conjunction with Mathematica Policy Research, Inc.; and served on the advisory committee for the Harvard School of Public Health's Dietary Intake, Economic Research Service/U.S. Department of Agriculture grant. A study director for the Institute of Medicine for 8 years, she directed studies of nutritional status during pregnancy and lactation (4 studies); WIC nutrition risk criteria; dietary reference intakes on the B vitamins and choline; and others. At the National Center for Education in Maternal and Child Health, Georgetown University, she managed projects on maternal and child nutrition. At Harvard School of Public Health, she worked on the development and testing of instruments for collecting dietary information from low-income women. She currently serves on the IOM Committee on Dietary Risk Assessment in the WIC Program. She has a B.S. degree from Cornell University, an M.S. from the University of California at Berkeley, and Sc.M. and Sc.D. degrees from the Harvard School of Public Health.

MICHELE VER PLOEG (*Study Director*) is a member of the staff of the Committee on National Statistics. Her research interests include the effects of social policies on families and children, the outcomes of children who experience poverty and changes in family composition, and individuals' education attainment choices. She received a B.A. in economics from Central College and M.S. and Ph.D. degrees in consumer economics and housing from Cornell University.