REFERENCES

Baydar, Nazli, Margaret McCann, Rick Williams, and Eric Vesper. "Final Report: WIC Infant Feeding Practices Study." Seattle WA: Batelle, November 1997.

Citro, Constance F., and Robert T. Michael (eds). *Measuring Poverty: A New Approach.* Washington, DC: National Academy Press, 1995.

Coder, John, and Lydia Scoon-Rogers. "Evaluating the Quality of Income Data Collected in the Annual Supplement to the March Current Population Survey and the Survey of Income and Program Participation." Washington, DC: U.S. Bureau of the Census, 1994.

Cody, Scott. "Characteristics of Food Stamp Households: Fiscal Year 1996." Report submitted to the U.S. Department of Agriculture, Food and Nutrition Service. Washington, DC: Mathematica Policy Research, Inc., March 2, 1998a.

Cody, Scott. "Trends in FSP Participation Rates: Focus on August 1996." Memorandum submitted to Jenny Genser at the U.S. Department of Agriculture, Food and Nutrition Service. Washington, DC: Mathematica Policy Research, Inc., April 17, 1998b.

Devaney, Barbara. "Yield of Risk for Three WIC Nutrition Risk Criteria." Report submitted to the U.S. Department of Agriculture, Food and Consumer Service. Princeton, NJ: Mathematica Policy Research, Inc., September 29, 1997.

Devaney, Barbara, and Allen Schirm. "Infant Mortality Among Medicaid Newborns in Five States: The Effects of Prenatal WIC Participation." Alexandria, VA: U.S. Department of Agriculture, Food and Nutrition Service, 1993.

Devaney, Barbara, Linda Bilheimer, and Jennifer Schore. "The Savings in Medicare Costs for Newborns and Their Mothers from Prenatal Participation in the WIC Program." Volumes I and II. Alexandria, VA: U.S. Department of Agriculture, Food and Nutrition Service, 1991.

Doyle, Pat. "Further Analysis of WIC-Eligible Individuals." Memorandum to Sandy Bastone, Food and Nutrition Service. Washington, DC: Mathematica Policy Research, Inc., October 1, 1990.

Doyle, Pat, and Carole Trippe. "Improving the Income Allocation Procedures in MATH." Report submitted to the U.S. Department of Agriculture, Food and Nutrition Service. Washington, DC: Mathematica Policy Research, Inc., December 1991.

Gordon, Anne, and Lyle Nelson. "Characteristics and Outcomes of WIC Participants and Nonparticipants: Analysis of the 1988 National Maternal and Infant Health Survey." Final report submitted to the U.S. Department of Agriculture, Food and Consumer Service. Alexandria, VA: U.S. Department of Agriculture, March 1995.

Gordon, Anne, Kimball Lewis, and Larry Radbill. "Income Variability Among Families with Pregnant Women, Infants, or Young Children." Final report submitted to the U.S. Department of Agriculture, Food and Consumer Service. Princeton, NJ: Mathematica Policy Research, Inc., January 1997.

Greenstein, Robert, Jennifer Duskal, and Edward Lazere. "What Is the WIC Full Funding Level?" Washington, DC: Center on Budget and Policy Priorities, April 1997.

Heiser, Nancy. "Persons in Poverty Based on the March 1992 CPS File." Memorandum to Alana Landey and Sandy Bastone, Food and Nutrition Service, Office of Analysis and Evaluation. Washington, DC: Mathematica Policy Research, Inc., November 17, 1992.

Heiser, Nancy, and Pat Doyle. "Estimated Number of WIC Income-Eligible Individuals Based on SIPP and CPS Data." Memorandum to Sandy Bastone, Food and Nutrition Service. Washington, DC: Mathematica Policy Research, Inc., September 25, 1990.

Institute of Medicine, Committee on Scientific Evaluation of WIC Nutrition Risk Criteria. *WIC Nutrition Risk Criteria: A Scientific Assessment.* Washington, DC: National Academy Press, 1996.

Interagency Board for Nutrition Monitoring and Related Research. *Nutrition Monitoring in the United States: The Directory of Federal and State Nutrition Monitoring and Related Research Activities,* edited by K. Bialostosky. Hyattsville, MD: National Center for Health Statistics, 1998.

Jabine, Thomas B., Karen E. King, and Rita J. Petroni. *Survey of Income and Program Participation: Quality Profile.* Washington, DC: U.S. Bureau of the Census, May 1990.

Ku, Leighton, Barbara Cohen, and Nancy Pindus. "Full Funding for WIC: A Policy Review." Washington, DC: Urban Institute Press, 1994.

Lazere, Edward, Kathryn H. Porter, and Laura Summer. "How Many People Are Eligible for WIC?" Washington, DC: Center on Budget and Policy Priorities, 1991.

Lewis, Kimball, and Marilyn Ellwood. "Medicaid Policies and Eligibility for WIC." Final report submitted to the U.S. Department of Agriculture, Food and Nutrition Service. Cambridge, MA: Mathematica Policy Research, Inc., July 1998. Publication by FNS is forthcoming.

Lewis, Kimball, Marilyn Ellwood, and John Czajka. "Counting the Uninsured: A Review of the Literature." Washington, DC: The Urban Institute, June 1998.

Lloyd, Bill. *SIPP Quality Profile.* 3rd Edition. Washington, DC: U.S. Bureau of the Census, 1998.

Naifeh, Mary. "Dynamics of Economic Well-Being, Poverty 1993-94: Trap Door? Revolving Door? Or Both?" Current Population Reports, Series P70-63. Washington, DC: U.S. Census Bureau, July 1998.

National Governors' Association, Center for Best Practices. "Early State Trends in Setting Eligibility Levels for Children and Pregnant Women." Washington, DC: NGA, September 1998.

National Governors' Association, Center for Best Practices. "State Medicaid Coverage of Pregnant Women and Children." Washington, DC: NGA, September 1997.

Nicholson, Walter. "Time Series Modeling of Income Eligibility for WIC." Report submitted to the U.S. Department of Agriculture, Food and Consumer Service. Princeton, NJ: Mathematica Policy Research, Inc., September 1996. Publication by FNS is forthcoming.

Ohls, James, Kimball Lewis, Julie Sykes, and Anne Gordon. "A Conceptual Feasibility Analysis for a WIC Microsimulation Model." Report submitted to the U.S. Department of Agriculture, Food and Consumer Service. Princeton, NJ: Mathematica Policy Research, Inc., October 1995.

Randall, Bonnie, Susan Bartlett, and Sheela Kennedy. "Study of WIC Participant and Program Characteristics: 1996." Report submitted to the U.S. Department of Agriculture, Food and Nutrition Service. Cambridge, MA: Abt Associates, 1998.

Rossi, Peter H. *Feeding the Poor: Assessing Federal Food Aid.* Washington, DC: AEI Press, 1998.

Ruggles, Patricia, and Roberton Williams. "Transitions In and Out of Poverty: New Data from the Survey of Income and Program Participation." Report presented at the annual meetings of the Allied Social Sciences Association. Washington, DC: The Urban Institute, 1986.

Ryan, A.S. "The Resurgence of Breast-Feeding in the United States." *Pediatrics*, vol. 99, no. 4, April 1997, electronic version, available at *http://www.pediatrics.org*.

Ryan, A.S., W.F. Pratt, J.L. Wysong, G. Lewandowski, J.W. McNally, and F.W. Krieger. "A Comparison of Breast-Feeding Data from the National Surveys of Family Growth and the Ross Laboratories Mothers Survey." *American Journal of Public Health*, vol. 81, no. 8, August 1991, pp. 1049-1052.

Scariati, P.D., L.M., Grummer-Strawn, and S.A. Fein. "A Longitudinal Analysis of Infant Morbidity and the Extent of Breast-Feeding in the United States." *Pediatrics*, vol. 99, no. 6, June 1997, electronic version, available at *http://www.pediatrics.org*.

Schirm, Allen. "State Estimates of WIC-Eligible Infants and Children in 1995." Memorandum to Cindy Long, U.S. Department of Agriculture, Food and Consumer Service. Washington, DC: Mathematica Policy Research, Inc., April 28, 1997.

Schirm, Allen. "Borrowing Strength Across Space and Time: Bayesian Shrinkage Estimates of Infants and Children Income Eligible for the WIC Program in 1994, by State." Final report to the U.S. Department of Agriculture, Food and Consumer Service. Washington, DC: Mathematica Policy Research, Inc., September 27, 1996.

Schirm, Allen. "The Shrinkage Estimator Used to Derive 1993 State Estimates of WIC Eligibles." Memorandum to Cindy Long, U.S. Department of Agriculture, Food and Consumer Service. Washington, DC: Mathematica Policy Research, Inc., September 29, 1995b.

Schirm, Allen. "State Estimates of Infants and Children Income Eligible for the WIC Program in 1992." Final report to the U.S. Department of Agriculture, Food and Consumer Service. Washington, DC: Mathematica Policy Research, Inc., May 1995a.

Schirm, Allen L., and Cindy Long. "Fund Allocation and Small Area Estimation in the WIC Program." In *Proceedings of the American Statistical Association*, 1995.

Schramm, Wayne F. "Prenatal Participation in WIC Related to Medicaid Costs for Missouri Newborns: 1982 Update." *Public Health Reports*, vol. 101, no. 6, 1986.

Schramm, Wayne F. "WIC Prenatal Participation and Its Relationship to Newborn Medicaid Costs in Missouri: A Cost/Benefit Analysis." *American Journal of Public Health*, vol. 75, no. 8, 1985.

Stavrianos, Michael. "Food Stamp Program Participation Rates: January 1994." Washington, DC: Mathematica Policy Research, Inc., March 1997.

Stockbauer, Joseph W. "WIC Prenatal Participation and Its Relation to Pregnancy Outcomes in Missouri: A Second Look." *American Journal of Public Health*, vol. 7, no. 7, 1987, pp. 813-818.

Stockbauer, Joseph W. "Evaluation of the Missouri WIC Program: Prenatal Components." *Journal of the American Dietetic Association*, vol. 86, no. 1, 1986, pp. 61-67.

Tordella, Stephen. "Persons in Poverty Based on the March 1997 CPS File." Memorandum to Janet Schiller, Food and Nutrition Service, Office of Analysis and Evaluation. Arlington, VA: Decision Demographics, Inc., May 20, 1998.

Tordella, Stephen. "Persons in Poverty Based on the March 1996 CPS File." Memorandum to Cindy Long, Food and Consumer Service, Office of Analysis and Evaluation. Arlington, VA: Decision Demographics, Inc., January 24, 1997.

Tordella, Stephen. "Persons in Poverty Based on the March 1995 CPS File." Memorandum to Cindy Long, Food and Consumer Service, Office of Analysis and Evaluation. Arlington, VA: Decision Demographics, Inc., February 29, 1996.

Trippe, Carole, and Allen Schirm. "Number of Infants and Children in WIC Income-Eligible Families in 1993 and 1992, Based on March 1994 CPS and Revised March 1993 CPS." Memorandum to Matthew McKearn and Cindy Long of the Food and Consumer Service, Office of Analysis and Evaluation. Washington, DC: Mathematica Policy Research, Inc., October 21, 1994.

Ullman, Frank, Brian Bruen, and John Holahan. "The State Children's Health Insurance Program: A Look at the Numbers." Assessing the New Federalism Occasional Paper. Washington, DC: The Urban Institute, March 1998.

U.S. Congressional Budget Office. "Cost Analysis of Full Funding for the Special Supplemental Food Program for Women, Infants, and Children (WIC)." Washington, DC: CBO, January 23, 1993.

U.S. Congressional Budget Office. "Estimated Cost to Provide Full Funding for the Special Supplemental Food Program for Women, Infants, and Children (WIC)." Washington, DC: CBO, September 11, 1990.

U.S. Department of Agriculture, Food and Nutrition Service. "USDA's Response to the House Surveys and Investigation Staff March 1998 *Report to the Committee on Appropriations, U.S. House of Representatives, on the Special Supplemental Nutrition Program for Women, Infants and Children*." Alexandria, VA: USDA, May 1998b.

U.S. Department of Agriculture, Food and Nutrition Service. "Special Supplemental Nutrition Program for Women, Infants, and Children (WIC): Eligibility and Coverage Estimates: 1996 Update." Alexandria, VA: USDA, April 1998a.

U.S. Department of Agriculture, Food and Consumer Service. "Special Supplemental Nutrition Program for Women, Infants, and Children (WIC): Eligibility and Coverage Estimates: 1995 Update." Alexandria, VA: USDA, April 1997.

U.S. Department of Agriculture, Food and Consumer Service. "Special Supplemental Nutrition Program for Women, Infants, and Children (WIC): Eligibility and Coverage Estimates: 1994 Update." Alexandria, VA: USDA, April 1996b.

U.S. Department of Agriculture, Food and Consumer Service. "Estimation of Persons Income Eligible for the Special Supplemental Nutrition Program for Women, Infants, and Children (WIC) in 1989: Final Report." Alexandria, VA: USDA, January 1996a.

U.S. Department of Agriculture, Food and Consumer Service. "WIC Program: State Agency Participation and Expenditure Report: Fiscal Year 1995: Month of September." Alexandria, VA: USDA, November 1995b.

U.S. Department of Agriculture, Food and Consumer Service. "Special Supplemental Nutrition Program for Women, Infants, and Children (WIC): Eligibility and Coverage Estimates: 1993 Update." Alexandria, VA: USDA, April 1995a.

U.S. Department of Agriculture, Food and Nutrition Service. "Estimates of Persons Income Eligible for the Special Supplemental Food Program for Women, Infants, and Children (WIC) in 1989." Two volumes. Alexandria, VA: USDA, August 1993.

U.S. Department of Agriculture, Food and Nutrition Service. "Estimating Eligibility for the WIC Program." Unpublished draft, dated July 12, 1991.

U.S. Department of Agriculture, Food and Nutrition Service. "Estimation of Eligibility for the WIC Program: Update of the WIC Eligibility Study to 1986." Alexandria, VA: USDA, February 1990.

U.S. Department of Agriculture, Food and Nutrition Service. "Estimation of Eligibility for the WIC Program: Report of the WIC Eligibility Study: Technical Appendixes." Alexandria, VA: USDA, 1987b.

U.S. Department of Agriculture, Food and Nutrition Service. "Estimation of Eligibility for the WIC Program: Report of the WIC Eligibility Study: Summary of Data, Method and Findings." Alexandria, VA: USDA, July 1987a.

U.S. Department of Commerce, Bureau of the Census. "Survey of Income and Program Participation (SIPP) 1993 Panel, Wave 1 Core Microdata File Technical Documentation." Washington, DC: U.S. Government Printing Office, 1994.

U.S. Department of Commerce, Bureau of the Census. "Current Population Survey, Technical Documentation." Washington, DC: U.S. Government Printing Office, 1993.

U.S. Department of Health and Human Services. "Indicators of Welfare Dependence: Annual Report to Congress." Washington, DC: DHHS, October 1997.

U.S. General Accounting Office. "WIC: State Had a Variety of Reasons for Not Spending Program Funds." Washington, DC: GAO, June 1997.

U.S. General Accounting Office. "Early Intervention: Federal Investments Like WIC Can Produce Savings." Report no. GAO/HRD-92-18. Washington, DC: GAO, 1992.

U.S. House Committee on Appropriations, Subcommittee on Agriculture, Surveys and Investigations Staff. "A Report to the Committee on Appropriations, U.S. House of Representatives, on the Special Supplemental Nutrition Program for Women, Infants, and Children." Washington, DC: U.S. Congress, 1998.

U.S. House of Representatives, Committee on Ways and Means. *1998 Green Book*. Washington, DC: U.S. Government Printing Office, 1998.

U.S. House of Representatives, Committee on Ways and Means. *1996 Green Book*. Washington, DC: U.S. Government Printing Office, 1996.

Yip, Ray. "The Changing Characteristics of Childhood Iron Nutritional Status in the United States." In *Dietary Iron: Birth to Two Years*, edited by C.J. Filer. New York: Raven Press, 1989.

Yip, Ray, Nancy J. Binkin, Lee Fleshood, and Frederick L. Trowbridge. "Declining Prevalence of Anemia Among Low-Income Children in the United States." *Journal of the American Medical Association*, vol. 258, no. 12, 1987, pp. 1619-1623.

Yip, Ray, Ibrahim Parvana, Kelly Scanlon, Ellen W. Borland, Carl M. Russell, and Frederick L. Trowbridge. 1992. "Pediatric Surveillance System--United States, 1980-1991." *Morbidity and Mortality Weekly Report*: CDC *Surveillance Summaries*, vol. 41, pp. 1-23.

Zedlewski, Sheila, and Linda Giannarelli. "Diversity Among State Welfare Programs." Washington, DC: The Urban Institute, 1998.

APPENDIX A

POTENTIAL DATA SOURCES FOR WIC ELIGIBILITY AND PARTICIPATION ESTIMATES

This appendix describes principal data sources that are relevant to estimating WIC eligibility and measuring participation rates, relevant in that they have been used to estimate WIC eligibility or are discussed in the body of the report as alternatives to data sets used now. Each data source is assessed on the basis of (1) the extent to which it provides useful information for determining WIC categorical eligibility, income eligibility, adjunct eligibility, nutritional risk, or participation rates; and (2) its representativeness at the national and state levels. Table A.1 summarizes what is available from each major survey data source.

SOURCES FOR ESTIMATING CATEGORICAL AND INCOME ELIGIBILITY

Two data sets are the primary options for estimating categorical and income eligibility: (1) the March Current Population Survey, and (2) the Survey of Income and Program Participation.

The March Current Population Survey (CPS)

a. Overview

The CPS is a monthly survey administered by the Census Bureau for the Bureau of Labor Statistics. The CPS surveys about 50,000 U.S. households that have been selected to represent the civilian noninstitutionalized population. The monthly core CPS survey is the primary source of information on employment issues in the United States. Each March, in addition to the monthly core CPS questionnaire, the supplemental Annual Demographic Survey (March CPS) is administered. It provides information on household composition, labor force activity, income, and participation in various government programs, such as AFDC/TANF, Supplemental Security Income (SSI), General Assistance (GA), the FSP, and Medicaid. The monthly unemployment estimates reported by the U.S. Bureau of Labor Statistics and the annual poverty rates reported by the U.S. Bureau of the Census are both based on CPS data.

The interviewed population is based on a multistage stratified sample of the noninstitutionalized resident population of the United States. This includes people living in households and in group quarters, such as college dormitories and rooming houses. Residents of institutions (for example, homes for elderly people) and people living abroad are excluded. People residing in military barracks, although part of the noninstitutionalized

TABLE A.1

MAJOR POTENTIAL DATA SOURCES FOR WIC ELIGIBILITY ESTIMATION

	March CPS	SIPP	NHANES	CSFII	NMIHS
Categorical Eligibility					
Pregnancy Status	No[a]	No[a]	Yes	Yes	Yes
Breast-Feeding Status	No	No	Yes	Yes	Yes
Postpartum Status	No	No	Yes	Yes	Yes
Age of Child (in Years)	Yes	Yes	Yes	Yes	Yes
Age of Infant (in Months)	No	No[a]	Yes	Yes	Yes
Income Eligibility					
Annual Income	Yes	No	Yes	Yes	Yes
Monthly Income	No	Yes	Yes	Yes	No
Public Assistance Income Identified	Yes	Yes	No	Yes	Yes
Medicaid Participation	Yes	Yes	Yes	Yes	Yes
Nutritional Risk					
Dietary	No	No	Yes	Yes	No
Hematologic	No	No	Yes	No	No
Anthropometric	No	No	Yes	Yes	Yes
Other Medical	No	No	Yes[b]	No	Yes[b]
WIC Participants Identified	No	Yes	Yes	Yes	Yes
Data Representative at National, State, or Local Levels	National State	National	National	National	National State
Frequency of Data Collection	Annual	Every 4 months for 4 years; new panel every 4 years	Approximately every 10 years; will become annual	Approximately every 5 years; will become annual	One-time only
Time Lag Until Data Available	9 Months	Approximately 18 months for wave files; Approximately 5 years after start of panel for longitudinal files	Has been up to 8 years	Approximately 2 years	Approximately 3 years

[a]Can be attained by linking current survey results with previous and subsequent results.

[b]Not all risks are measured; NHANES includes more than NMIHS.

population, are also excluded. Other armed forces personnel are included if they are living in a housing unit on or off base (U.S. Department of Commerce 1993).

The March survey contains questions on demographic characteristic and labor force participation for the week containing the 12th day of March. It also contains income and employment information for the preceding calendar year. The demographic data include age, gender, race/ethnicity, marital status, educational attainment, family structure, and place of residence. The economic data include current and past labor force participation and annual income from salaries, self-employment, cash transfers (SSI, AFDC/TANF, GA), assets, and other sources of income.

b. Data on WIC Eligibility

The CPS identifies infants and children categorically eligible for WIC by identifying their age. Using family relationship information, it is possible to identify mothers of infants as well.

Although pregnancy status is not available on the CPS, the pregnancy status of some women could be inferred by examining subsequent CPS surveys. Each CPS survey is not an independent sample: persons selected for the survey are interviewed for 4 consecutive months, left out of the survey for 8 months, and then interviewed for 4 more months. Thus, pregnancy status of some women could be inferred by linking data across interviews and noting the presence of a new infant in a subsequent survey.

The CPS includes data on annual income in the previous calendar year as well as public assistance income. Participation in AFDC/TANF, the FSP, and Medicaid at some time during the previous calendar year is measured. There are no breast-feeding or nutritional-risk data, nor does the CPS identify WIC participants.

CPS data are representative at the national and state levels, although the sample of low-income people is small in some states. The data are also very timely; they are available to the public approximately 9 months after the survey is administered. As described in Chapter II, FNS uses the March CPS both for national estimates of those income-eligible for WIC and as the basis for state-level estimates.

Survey of Income and Program Participation (SIPP)

a. Overview

SIPP is a nationally representative longitudinal survey that provides detailed monthly information on household composition, family composition, income, labor force activity, and participation in government programs such as WIC, Medicaid, AFDC/TANF, and the FSP. The purpose of SIPP is to collect information on income, employment status, program participation, and program eligibility. These data are used primarily to (1) measure the effectiveness of federal, state, and local programs; (2) estimate future eligibility and cost for government programs; and (3) create more accurate estimates of income and poverty statistics [www.sipp.census.gov].

A new sample is selected for SIPP on a regular basis (originally, every year) and interviewed repeatedly; each set of interviews based on the same original sample is referred to as a panel (U.S. Department of Commerce 1994). The sample sizes for SIPP panels that started between 1984 and 1993 varied but included about 20,000 households on average. During this period, many SIPP panels overlapped, which allowed some cross-sectional analyses to combine data from two panels. The follow-up period for most panels was 32 months. No SIPP panels started in 1994 and 1995; instead, the follow-up periods for the 1992 and 1993 panels were extended while the Census Bureau redesigned SIPP. The redesign was implemented such that, starting with the 1996 panel, panels will be followed for 4 years and will no longer overlap. However, sample sizes will be somewhat larger (37,000 households for the 1996 panel).

Sample households within each panel are divided into four subsamples of roughly equal size, referred to as rotation groups. One rotation group is interviewed each month; at each interview, information is collected about the prior 4 months. Each cycle through the four rotation groups using the same questionnaire is called a wave. This interview schedule results in each household in the sample being interviewed at 4-month intervals. Traditionally, there were eight waves in each SIPP panel, providing up to 32 months of income and program participation data for each sample person. There will be 12 waves of interviews for each panel under the new design, providing up to 48 months of data.

The Census Bureau tries to interview all adults (persons age 15 or older) present at the time of the first interview. Those under age 15 who are members of originally sampled households are also considered original sample members, and relevant information is collected about them. During subsequent interviews, original sample members and anyone living with them are considered part of the sample for that wave. Original sample members continue to be interviewed even if they move to a different address.

The Census Bureau creates files with data for each wave of interviews. Upon completion of the final wave of interviews with members of a panel, the Bureau also constructs longitudinal files for each calendar year, as well as a full-panel longitudinal research file. To do so, the Bureau links the data collected for each sample person over the life of the panel; each record contains the stream of data for a single person. These person-level data are weighted to reflect how many interviews each person completed during the panel; separate weights are constructed for each calendar year of a panel, and for the full panel.

b. Data on WIC Eligibility

SIPP provides monthly income data and identifies many types of public assistance income. The income questions are more detailed than those in the CPS, which leads to better reporting of many types of transfer income (social security, SSI, unemployment compensation, veterans' benefits, and child support payments). However, SIPP still undercounts income. Furthermore, reporting of AFDC/TANF and other welfare surprisingly is no more complete in SIPP than in the CPS (Coder and Scoon-Rogers 1994). To the extent that income is underreported in the data, eligibility is overestimated.

In terms of categorical eligibility, SIPP does not provide breast-feeding data, but it does identify the age of children in years. Pregnancy status and an infant's age in months can be determined by analyzing the SIPP longitudinal files or linked waves. There are no nutritional-risk data. WIC participants are identified but are severely undercounted in comparison to WIC administrative data (Gordon et al. 1997).

Wave files are available to the public approximately one-and-a-half years after the survey is administered; longitudinal files have been released as much as 5 years after the first year of a panel.

These data are representative at the national level. However, SIPP data are not suitable for state-level analyses. For confidentiality purposes, SIPP files do not uniquely identify the state of residence in records from the following groups of states: (1) Maine and Vermont; (2) Iowa, North Dakota, and South Dakota; and (3) Alaska, Idaho, Montana, and Wyoming. For example, records from Maine and Vermont are given the same state code in SIPP and therefore are indistinguishable from one another. Even for states that are uniquely identified, the Census Bureau does not recommend the use of SIPP for state-level estimates, because SIPP has very small samples in many states, and because sample was not designed to produce state estimates (Ohls et al. 1995).

These are two distinct problems. First, in some small states, the sample size would be too small (especially for subgroups such as WIC eligibles) to produce precise estimates, even if the sample were a simple random sample of the state population. Sample sizes may be so small that the confidence interval around a proportion, for example, would cover most of the range from zero to one. Second, the SIPP sample design makes it likely that in some states, the sample (even when weighted) will not resemble the population of the state as a whole. SIPP's primary sampling units (PSUs) are made up of counties within a single state. However, PSUs are not stratified by state. A single stratum may contain PSUs from more than one state, and samples are weighted to reflect strata control totals rather than state control totals. Although the sample design ensures that at least one PSU is selected from each state, it does not ensure that at least one PSU is selected from each stratum in each state; thus, it is possible that a sample could contain no records from a particular stratum in a state. Nonetheless, state direct sample estimates are technically unbiased, and samples are representative in the sense that the chance of selection for every household in a state under this design is nonzero and known. In other words, in repeated applications of the SIPP sample design, state samples would resemble the state population on average and estimates would equal the population values on average. However, many of the selected samples would not resemble the state population in those states in which PSUs are not selected from every stratum, despite the resemblance of the "average" sample. To assess the extent of this problem better, it would be useful to know the number of states that lack PSUs from some strata, but this figure is not currently available.

SOURCES OF BREAST-FEEDING AND NUTRITIONAL-RISK DATA

Several large national surveys collect data on breast-feeding and nutritional-risk factors.

National Health and Nutrition Examination Surveys (NHANES)

a. Description

There have been three NHANES, which were designed to provide nationally representative reference data and prevalence estimates for various health and nutrition measures. The data are used to produce national population health parameter estimates, estimate the national prevalence of selected diseases and disease factors, investigate secular trends in selected diseases and risk factors, contribute to the understanding of disease etiology, and investigate the natural history of selected diseases. The most recent round, NHANES III, collected data from 1988 to 1994. It is a nationally representative study of the health and nutritional status of the civilian noninstitutionalized population age 2

months or older. The sample size was approximately 30,000. NHANES II data collected from 1976 to 1980 were used for the WIC Eligibility Study I; this earlier round included data on about 25,000 people 6 months old or older. In general, NHANES data include many WIC nutritional risks, such as measures of dietary intake, anthropometric measurements, and biochemical and hematological indicators of nutritional status.

NHANES III included both a household interview and a standardized detailed medical examination in a mobile examination center. After selecting individuals to be included in the sample, interviewers administered either the Adult Household Questionnaire, for people aged 17 years and older, or the Household Youth Questionnaire, for people aged 2 months through 16 years. Following the interview with the sampled person, an adult household member completed the Family Questionnaire, which collected family-level information on economic and sociodemographic characteristics of the family unit. Sampled persons were then asked to visit a mobile examination center for a medical examination that included a physical examination, blood and urine collection, and other clinical tests and measurements. Approximately 77 percent of those sampled completed the medical examination portion of NHANES III.

The sampling scheme for NHANES III is based on a complex, stratified, multistage probability clustered design. The survey oversampled children under age 5, adults aged 60 years and over, African Americans, and Mexican Americans, which produced more reliable estimates for these subgroups. Although low-income populations were not oversampled directly, the oversampling of African and Mexican Americans, who have a higher relative incidence of poverty, increased the size of the low-income sample.

An analysis of persons in NHANES III either on WIC or with incomes below 200 percent of the poverty level showed that this low-income sample contained 7,245 people, including 1,198 infants; 3,164 children; 244 pregnant women; 240 breast-feeding or postpartum women; and 2,399 non-pregnant, non-breast-feeding women 15 to 44 years of age (Devaney 1997).

b. Data on WIC Eligibility

NHANES III contains information on dietary intake, hematologic status, anthropometric measurements, and other related medical conditions. These data identify the age of infants and children, as well as pregnancy, postpartum, and breast-feeding status of women. Annual and monthly income are reported, as well as Medicaid and WIC participation. These data are representative at the national level. Public-use files for the full sample became available in 1997. Sigma One Corporation, under contract to FNS, is using NHANES III to update estimates of the proportion of low-income women, infants, and children at nutritional risk.

c. Future Plans

The National Center for Health Statistics is planning to convert NHANES to an annual, ongoing survey [www.cdc.gov/nchswww/about/major/nhanes/hanesgen.htm]. Data collection under the new design is scheduled to begin in April 1999, and initial data files are expected to be available about 3 years later.[1] Samples of about 5,000 people will be interviewed and examined each year, and each year's data will be nationally representative and available for separate analysis. Timeliness of the data may thus improve, although several years of data will still be needed to have adequate samples of WIC-eligible populations.

Another development relevant to estimation of WIC eligibility is that NHANES will merge with the Continuing Survey of Food Intakes by Individuals (see next section) in the year 2000. Details of what this merger will involve are not yet available, but it may imply that more detailed dietary data will be added to NHANES, which in turn may improve the data available for estimating the level of dietary risk in WIC-eligible populations.

[1]Electronic mail message from Shannon K. Wiser, National Center for Health Statistics, February 9, 1999.

Continuing Survey of Food Intakes by Individuals (CSFII)

a. Description

The CSFII is a periodic national survey of trends in how Americans eat and of factors that affect dietary status. It is sponsored by the USDA Agricultural Research Service. The most recent round of the CSFII (1994-96) collected 24-hour dietary-intake data for 2 nonconsecutive days for more than 15,000 people of all ages. The data are collected by an interviewer in person and rely on respondent recall. The CSFII oversamples low-income households. Each survey is conducted from April of the survey year to March of the following year, and data are available approximately 1 year later.

The CSFII collects information on the types and amount of food ingested, nutrient intake, demographics, employment, annual income, monthly income, assets, urbanization, receipt of government assistance, receipt of food stamps, receipt of free or reduced-price school lunches, and WIC participation and duration.

b. Data on WIC Eligibility

The CSFII contains dietary-intake data and self-reported anthropometric measurements but no information on hematologic status or other medical conditions. These data identify the age of infants and children, as well as the pregnancy, postpartum, and breast-feeding status of women. Annual and monthly income are both reported, as is income from AFDC/TANF and the FSP, and Medicaid and WIC participation. These data are representative at the national level and are available 1 year after the survey is administered. The primary strength of this data source is as a measure of dietary risk. As noted in the previous section, plans are under way to merge the CSFII with NHANES.

The 1988 National Maternal and Infant Health Survey (NMIHS)

a. Description

In 1988, NCHS sponsored this nationally representative survey to better understand pregnancy outcomes, child growth and development, and the use and cost of health care services for pregnant women and infants. The NMIHS captured 1988 natality events. Three national populations were selected for the sample from state vital records: (1) women who had live births (sample size of 10,000), (2) women who had a fetal death at least 28 weeks into their gestation (sample size of 4,000), and (3) women whose infants died (sample size of 6,000). The data are representative at the state level for 48 states and the District of Columbia; Montana and South Dakota did not participate. Because rates of low birthweight and infant mortality are about twice as high among African Americans as among whites, low- and very-low-birthweight infants and African American infants were oversampled in the live birth component of the NMIHS.

The survey was conducted by mail with telephone followup for those who did not respond by mail. The response rate was 74 percent for mothers with live births. Mothers completed the survey from 6 to 30 months after the birth, the median being about 16 months. Data were collected on both the prenatal period and the 6 months after the birth.

b. Data on WIC Eligibility

The NMIHS contains mothers' reports on anthropometric measurements and on some medical risks related to pregnancy (history of past pregnancies; smoking, alcohol, and drug use during and after pregnancy). The data also include some information on infants' medical risks, such as birth defects and low birthweight. There are no data on dietary intake or hematologic status.

The NMIHS collects detailed data on infant feeding practices, including the initiation and duration of breast-feeding, and thus has been used to measure the breast-feeding rates of WIC-eligible mothers.

The data also include measures of total income and public assistance income in the year before the birth and of Medicaid and WIC participation both before and after the birth.

SOURCES FOR WIC PARTICIPATION DATA

FNS generates a monthly State Agency Participation and Expenditure Report based on data provided by WIC state agencies. This report reveals monthly participation counts for women, infants, and children by state. Participation is based on issuance of the food instrument (voucher), regardless of whether or not the recipient actually uses it. These data count all participants, not a sample. Each state WIC agency is responsible for reporting the number of eligibles who participate in a given month. It takes up to 6 months before these data are complete.

SOURCES FOR MEDICAID ADJUNCT ELIGIBILITY

There is no comprehensive national Medicaid data source. Instead, program statistics are available through data submitted to HCFA by states. Below is a description of two principal sources of Medicaid administrative data that contain information relevant to WIC eligibility--HCFA 2082 data and the State Medicaid Research Files (SMRF) data. The 2082 and SMRF data are not currently used for estimating WIC eligibility, but they were considered by Lewis and Ellwood (1998), from which most of this discussion is adapted. See also Chapter III.

The 2082

The 2082 data (named after the HCFA form on which those data are submitted) is a hard-copy report showing yearly aggregate Medicaid enrollment and claims by state and eligibility group. Originally, all states submitted hard copies of the 2082; now, more than 30 states submit their 2082 data electronically through the voluntary Medicaid Statistical Information System (MSIS) project. The 2082 data are usually available within 12 months after the end of the year, are easily obtainable, and include all 50 states and the District of Columbia. HCFA does only limited quality checks on the data--quality assurance for the 2082 is ultimately the responsibility of the states.

The 2082 is actually a series of tables for each state that report aggregate data on Medicaid enrollees, recipients, service utilization, and payments for the federal fiscal year. The tables show such information as the distribution of enrollees and recipients by age, sex, and race.

The 2082 data contain no information on pregnancy status, family income, or assets. In addition, the 2082 data on infants have limitations. For example, HCFA 2082 data and WIC administrative data count infants differently, which yields numbers that are not fully comparable. The HCFA 2082 data show the number of infants born during the federal fiscal year who were ever enrolled during the year, whereas estimates of WIC eligibles approximate those eligible in an average month.

In addition, some states count infants differently from other states in the 2082 data. For states that do not participate in HCFA's MSIS system,

HCFA 2082 instructions indicated that enrollees should be classified by their age as of March 31--the midpoint of the fiscal year. There are no instructions, though, for classifying infants born between March 31 and the end of the fiscal year. If they are also classified as infants, which is the most likely possibility, then the 2082 is in effect counting as infants all those born during a one-and-a-half-year period--that is, those under age 1 as of March 31 and those born during the 6-month period from March 31 to September 30. In contrast, MSIS states, for which the 2082 tables are created by HCFA, count as infants all those born during the year who were ever enrolled in Medicaid. As a result, the proportion of infants reported in MSIS states should be about one-third lower, on average, than the proportion of infants reported in non-MSIS states. As a result of the Balanced Budget Act of 1997, all states are required to submit electronic claims data in the MSIS format for claims filed on or after January 1, 1999. Although this will standardize the counting of infants, the issue will remain a problem for several years, since estimates are based on survey and administrative data that are several years old.

Last, infants may be undercounted in the 2082 data because some states take a few months to process the enrollment of infants following birth. In many states, infants do not appear on Medicaid files until their second or third month of life. As a result, infants who are born during the last few months of the fiscal year and who are covered by Medicaid may not be counted as enrolled in the 2082 data for that year. This can occur in both MSIS and non-MSIS states. It is thus difficult to tell from the 2082 data whether state-to-state differences in numbers of infants represent true differences among the states, or simply differences in the way that states report their data.

State Medicaid Research Files (SMRF)

SMRF are person-based Medicaid enrollment and claims files that are designed for research. The files are created from the MSIS files that states submit in lieu of a 2082 report, but they contain some additional variables, go through additional quality checks, and are based on calendar year rather than fiscal year. Although participation in MSIS has historically been voluntary, the Balanced Budget Act of 1997 requires that all states submit electronic claims data in the MSIS format for claims filed on or after January 1, 1999.

The files include a person-summary file and four types of claims files. The person-summary file, which is the most likely to be used for WIC eligibility analyses, contains summary information on eligibility, utilization, and expenditures for each person ever enrolled during the calendar year. The person-summary file also contains basic demographic data. Of particular interest for WIC research, the demographic data identify pregnant women (based on inpatient claims for delivery) and contain a set of uniform eligibility codes that classify Medicaid enrollees into the key

eligibility groups of interest for most types of research. However, like the 2082 data, SMRF data contain no information on family income or assets.

SMRF files are checked for quality, and a detailed set of tables indicating states' data problems is produced. Still, the quality of SMRF data ultimately depends on the quality of states' MSIS files. Unfortunately, SMRF files are not as timely as 2082 data--there is currently a 2- to 3-year lag in the release of SMRF files.