United States Department of Agriculture

Food and Consumer Service

Office of Analysis and Evaluation

Estimation of Persons Income Eligible for the Special Supplemental Nutrition Program for Women, Infants and Children (WIC) in 1989

Final Report

Estimation of Persons Income Eligible for the Special Supplemental Nutrition Program for Women, Infants, and Children (WIC) in 1989

Prepared for the U.S. Department of Agriculture
Food and Consumer Service
Under Contract Number 53-3198-2-014

January 1996

C-1

Sigma One Corporation

Acknowledgements

The following persons served as Expert Reviewers of the work undertaken by Sigma One Corporation throughout the Second WIC Eligibility Study. Their careful review and counsel provided guidance in the development of analytical and statistical methods and in the interpretation and presentation of the results of the WIC Eligibility Study. We are grateful for their quick response to our inquiries and most importantly their dedication to relevance and analytical rigor which helped the staff of Sigma One Corporation accurately estimate the size of the population eligible for WIC.

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Executive Summary

This report presents results from the WIC Eligibility Study II, undertaken by Sigma One Corporation to calculate the number of persons that met income and categorical eligibility criteria for the WIC Program in 1989. These estimates of eligibility were required at the national, state, and county level by the Child Nutrition Act, PL 101-147, which mandated that the 1990 Census of Housing and Population be used to calculate the number of persons that met income and categorical eligibility criteria for the WIC Program.

The estimation of WIC eligibility is a two-part process. First, the size of each of the five categorically eligible groups--pregnant women, postpartum non-breastfeeding women, postpartum breastfeeding women, infants (0 to 1 year of age), and children (1-4 years) who also met the income criterion for the WIC program was estimated. Second, the proportion of WIC income-eligible persons likely to be at nutritional risk and thus eligible for the WIC program is estimated using health survey data. This report presents the results of the first phase of the analysis. The results of the second phase of the analysis will be presented in the companion volume, *Nutritional Risk Analysis and Estimation of Eligibility for the Special Supplemental Nutrition Program for Women, Infants, and Children (WIC) in 1989.*

Nationwide, on the basis of data from the 1990 Census, 9.3 million women, infants, and children were eligible for the WIC program based on their income and categorical status. The key findings of this analysis were:

- An estimated 8.96 million persons in the 50 states and the District of Columbia were income eligible for WIC benefits in an average month of 1989. When estimates for Puerto Rico, the Virgin Islands, and Guam are included, an estimated 9.3 million persons were income eligible for WIC in 1989.

- The WIC income-eligible population represented 37 percent of the U.S. population of pregnant, breastfeeding and non-breastfeeding postpartum women, infants, and children at all income levels in 1989.

- More than one of three infants and children under five years of age in the United States were income eligible for the WIC program in 1989. Infants and children represented 80 percent of the WIC-eligible population.

- In 1989, pregnant women and postpartum non-breastfeeding and breastfeeding women represented 20 percent of the income-eligible population. More than half of these women were pregnant women.

- The white non-Hispanic group represented almost half of the income-eligible population in 1989. One of four income-eligible persons was black non-Hispanic and one of five income-eligible persons in 1989 was Hispanic.

- In 1989, more than half of the WIC income-eligible population lived in families with incomes below the federal poverty level.

The estimates for this analysis were developed from counts in a special extract of the 1990 Census combined with survey data from the 1988 National Maternal and Infant Health Survey (NMIHS), and natality and mortality data from Vital Statistics of the United States. For infants and children, the estimates were based on direct counts from the Census data. Since the Census does not identify pregnant, postpartum breastfeeding and non-breastfeeding women, these categories were estimated by a methodology that used vital statistics and NMIHS data in addition to Census data. The estimates of the average monthly number of pregnant women were calculated by estimating the number of women pregnant for any portion of 1989 adjusted for the portion of 1989 they were pregnant. The estimates for postpartum breastfeeding and non-breastfeeding women were derived from counts of women with their own infants and infants not with their own mothers. Estimates for all women's categorical groups were adjusted for multiple births and fetal and infant deaths. The 1989 NMIHS data were used to develop estimates of breastfeeding duration by maternal age and income level.

A comparison of the estimates from the WIC Eligibility Study I using 1979 Census data and the results of the WIC Eligibility Study II using 1989 Census data indicated the following:

- The estimated number of persons income-eligible for the WIC program grew by 16 percent, from 7.7 million persons estimated in 1979 to 8.96 million persons in the 50 states and the District of Columbia in 1989.

- Although roughly one in five income-eligible persons were women in both 1979 and 1989, there were relatively more income-eligible pregnant women in 1989.

The differences in the estimated WIC income-eligible population from 1979 to 1989 resulted from a variety of factors. For infants and children, the primary source of change was population growth and changes in the economy. For women, the change was due in part to economic and demographic changes and in part to methodological differences between the 1979 and 1989 estimates.

Under the Child Nutrition and WIC Reauthorization Act of 1989, persons eligible for Food Stamps, Aid to Families with Dependent Children (AFDC), and Medicaid, as well as members of families in which a pregnant woman or infant receives Medicaid are considered automatically income eligible for the WIC program. This study also estimated the effects of Medicaid adjunct eligibility on the WIC-eligible population to identify the number of additional persons in each categorical group who would have been eligible for WIC in 1989 because they were Medicaid recipients. The results showed that had the adjunct eligibility legislation been in effect in 1989, the additional pregnant women, infants, and children would have represented from 1 to 2.7 percent of the WIC income-eligible population, overall, depending on the state income cut-off values for Medicaid eligibility and the Medicaid participation rates.

1. Introduction

The Child Nutrition Act, PL 101-147, mandates that the 1990 Census of Housing and Population be used to calculate the number of persons that met income and categorical eligibility criteria for the Special Supplemental Nutrition Program for Women, Infants, and Children (WIC) in 1989. These estimates of eligibility are required at the national, state, and county levels. This study was carried out by Sigma One Corporation, under contract with the Food and Consumer Service (FCS) of the U.S. Department of Agriculture (USDA), to meet this requirement. Its primary purpose was to develop estimates of the number of persons that were eligible for the WIC program as determined by the 1990 Census of Housing and Population and other data. This report presents the principal findings and the methodology of this study, known as the WIC Eligibility Study II.[1] Complete national, state, and county-level counts of persons income eligible for the WIC program can be found in the two volumes of the *Estimates of Persons Income Eligible for the Special Supplemental Food Program for Women, Infants and Children (WIC) in 1989* published by the Office of Analysis and Evaluation, USDA/FCS in August 1993.

Since 1974, when it was first authorized by Congress, the WIC program has provided supplemental foods to women, infants, and children as part of preventive nutrition and health services for low-income infants, young children, and pregnant and postpartum women. Participation in the WIC program has greatly increased from the program's first year of operation when it served about 88,000 participants per month to an average of 6.5 million participants per month in 1994. The WIC program seeks to improve the health of participants and prevent health problems during critical periods of growth and development by providing selected nutritious foods such as milk and eggs, nutrition education, and access to social services and such health care services as prenatal care. The WIC program is administered by FCS. FCS distributes federal funds as grants-in-aid to the state health departments or

[1]This is the second time that the Decennial Census has been used as the basis for estimating the counts of persons that met categorical and income criteria for the WIC program at the national, state, and county levels. USDA (1987) published the results of the WIC Eligibility Study I in *Estimation of Eligibility for the WIC Program*, July 1987. That study was also undertaken by Sigma One Corporation under contract with USDA and drew on data from the 1980 Census.

comparable agencies in each of the 50 states, the District of Columbia, Puerto Rico, the Virgin Islands, and Guam. Local WIC agencies recruit participants and deliver program services.

Unlike the Food Stamp Program, Aid to Families with Dependent Children (AFDC), and Medicaid, WIC is not an entitlement program. It is a grant program which operates within funding limits set annually by Congress. WIC program administrators, researchers, and policy makers use the estimates of persons eligible for WIC to measure program coverage, identify underserved areas, and assist in allocation of funds among states.

WIC Eligibility

Eligibility for the WIC program is based on three sets of criteria: categorical, income, and nutritional risk. To participate in the WIC program, a person must meet all three sets of criteria. The Child Nutrition Act limits participation in the WIC program to pregnant, breastfeeding, and postpartum women; infants; and children. Participants must also meet income qualifications and be certified to be nutritionally at risk.

- To qualify for the WIC program, a person must fall into one of five categories. The *categorically eligible* groups are pregnant women, women up to six months postpartum who are not breastfeeding, breastfeeding women up to twelve months postpartum, infants to age one, and children to age 5.

- A participant must also be *income eligible*. The income for the household in which the person resides must be at or below 185 percent of the poverty income guidelines published annually by the Department of Health and Human Services (DHHS). These poverty guidelines vary by family size.[2] States may set lower standards corresponding to the income limits used in their other health delivery programs, but no state may use less than 100 percent of these poverty guidelines as the income criterion for WIC eligibility.

[2]For example, the Annual Poverty Income Guideline in effect between July 1, 1994, and June 30, 1995, for a family of four was $14,800, and the corresponding WIC income limit (185 percent of poverty level) for this family size was $27,380.

- Individuals who are categorically and income eligible must also be *at nutritional risk.* Nutritional risk is certified at local WIC clinics by a health professional who follows guidelines or standards established by the state agency.

Among the many nutritional risk conditions that qualify a person for WIC eligibility are anemia, poor weight gain during pregnancy, low birthweight of newborn, history of high-risk pregnancies, and poor dietary patterns. The number and type of medical conditions identified as nutritional risk criteria vary among states. In their Annual State Plans of Operation, WIC state-level agencies specify the nutritional risk criteria.[3]

Categorically eligible persons receiving Food Stamps, AFDC, and families in which a pregnant woman or infant receive Medicaid are automatically income eligible for the WIC program. The automatic or *adjunct eligibility* status streamlines the WIC enrollment procedure by making WIC income determinations unnecessary for people participating in these other programs.

Analysis Objectives

For the WIC Eligibility Study II, Sigma One Corporation developed estimates of the number of persons eligible to participate in the WIC program based on data from a special extract of the 1990 Census of Housing and Population.[4] The major objectives of the study were:

(1) to measure the size of the population as represented by the 1990 Census that met WIC categorical and income criteria, and

(2) to estimate the number of these persons eligible for WIC on the basis of nutritional risk.

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[3]For a detailed analysis of how nutritional risk is certified at the state level, see the companion volume to this report, *Nutritional Risk Analysis and Estimation of Eligibility for the Special Supplemental Nutrition Program for Women, Infants, and Children (WIC) in 1989 (forthcoming).*

[4]The Bureau of the Census prepared a special extract file of the 1990 Census for FCS for use in the WIC analysis. This Census Extract was based on the long form sample of the 1990 Decennial Census of Housing and Population.

National, state, and county level estimates for the United States (50 states and DC) were calculated as well as estimates for Puerto Rico, the Virgin Islands, and Guam. Because the 1990 Census collected information on 1989 annual incomes, these estimates were for calendar year 1989. This report presents the counts of the income-eligible persons in each category. These estimates represent the average monthly number of persons in the five categorical groups at or below 185 percent of poverty level in 1989. The estimates were calculated by race/ethnicity, poverty level, and age.

The estimation of WIC eligibility is a two-part process. First, the size of each of the five categorically eligible groups who also met the income criterion was estimated from counts in the 1990 Census, combined with vital statistics and breastfeeding information. In the second phase, the proportion of WIC income-eligible persons likely to be at nutritional risk and thus eligible for the WIC program is estimated using health survey data.

This report is the second in a series of three publications which summarize the WIC Eligibility Study II. In August 1993, FCS published *Estimates of Persons Income-Eligible for WIC in 1989, National, State and County Tables*. This publication provided detailed estimates of persons income-eligible for WIC, including estimates by race and ethnicity and by age. This second report presents the methodology for developing these estimates, a summary of the results, and a comparison of the estimates of the WIC income-eligible population in 1989 with previous estimates developed based on the 1980 Decennial Census. The final report will present estimates of the number of persons eligible for the WIC program in 1989, as well as a detailed description of the methodology used for estimating the incidence of nutritional risk among the WIC income-eligible population.

Organization of the Report

The remainder of this report is divided into three chapters. Chapter 2 presents the results of the estimations of WIC categorical and income eligibility for 1989 at the national and state levels. Chapter 3 describes the data sources used in the analysis and presents the methodology used to estimate categorical and income eligibility. Chapter 4 compares the results of the 1980

WIC Eligibility Study I using data from the 1980 Census with 1990 Census data from the current study. This chapter highlights the changes in income distribution, fertility patterns, and breastfeeding patterns that have taken place in the postcensal period, 1979-1989, and summarizes methodological differences between the two studies. Chapter 5 presents an analysis of the impact of Medicaid adjunct eligibility on the WIC-eligible population.

2. Estimates of the WIC Income-Eligible Population in 1989

Nationwide, on the basis of data from the 1990 Census, 9.3 million women, infants, and children were eligible for the WIC program based on their income and categorical status.[5] Compared to FCS' 1979 WIC-eligibles estimate (which is based on the 1980 Decennial Census), the estimated WIC income-eligible population increased by 16 percent.

The estimate of pregnant women, postpartum non-breastfeeding women, postpartum breastfeeding women, infants (under 1 year of age), and children (1-4 years) at or below 185 percent of poverty represent the average monthly number of persons income eligible for the WIC program. These estimates were undertaken at the county, state, and national level for the 50 states and the District of Columbia. Estimates for Puerto Rico, the Virgin Islands, and Guam are also included. This chapter presents the principal findings on the estimation of WIC income-eligible persons in 1989. The chapter includes a summary of the number of persons who were eligible for WIC benefits in an average month in 1989 at the national and state level.

The key findings of the WIC Eligibility Study II are:

- An estimated 8.96 million persons in the 50 states and the District of Columbia were income eligible for WIC benefits in an average month of 1989. When estimates for Puerto Rico, the Virgin Islands, and Guam are included, an estimated 9.3 million persons were income eligible for WIC in 1989.

- The WIC income-eligible population represented 37 percent of the U.S. population of pregnant, breastfeeding and non-breastfeeding postpartum women, infants, and children at all income levels in 1989.

- More than one of three infants and children under five years of age in the United States were income eligible for the WIC program in 1989. Infants and children represented 80 percent of the WIC-eligible population.

- In 1989, pregnant women and postpartum non-breastfeeding and breastfeeding women represented 20 percent of the income-eligible population. More than half of these women were pregnant women.

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[5]This estimate includes the 50 states, District of Columbia, Puerto Rico, the Virgin Islands, and Guam.

- The white non-Hispanic group represented almost half of the income-eligible population in 1989. One of four income-eligible persons was black non-Hispanic and one of five income-eligible persons in 1989 was Hispanic.

- In 1989, more than half of the WIC income-eligible population lived in families with incomes below the federal poverty level.

National Estimates

Table 1 presents a detailed enumeration of the 1989 WIC income-eligible population at the national level by income/poverty level. These estimates are given for women, infants, and children living in families with incomes below 75 percent of poverty, below 100 percent of poverty, below 130 percent of poverty, and below 185 percent of poverty. In 1989, more than half of the income-eligible population in the United States lived in families with incomes below the federal poverty guideline.

Figure 1 shows that four out of five persons who were income eligible for WIC benefits in the United States were infants and children under five years of age. Pregnant women represented more than half of the women's categorical groups. In 1989 at the national level, white non-Hispanics represented almost half of the WIC income-eligible population. One of four income-eligible persons was black non-Hispanic and one of five income-eligible persons was Hispanic. Figure 2 shows the racial/ethnic distribution of the WIC income-eligible population.

State and County-Level Estimates

Table 2 presents estimates of the WIC income-eligible population in 1989 for the 50 states, the District of Columbia, Puerto Rico, the Virgin Islands, and Guam. The state-level estimates were estimated for six racial/ethnic groups and for the women's categorical groups, the estimates were presented by maternal age. The estimations for each state and U.S. territory by racial\ethnic group and maternal age are presented in *Estimates of Persons Income Eligible*

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Table 1. Estimates of the Number of Women, Infants and Children Who Were Income Eligible for the WIC Program in 1989

United States(50 States and D.C. and Puerto Rico, Virgin Islands and Guam)
(estimates in '000 persons)

Income Level	Women's Categorical Groups: Pregnant Women	Postpartum Non-Breastfeeding	Postpartum Breastfeeding	Infants Under 1 year	Children 1 to 4 years	All WIC Groups
All Income Levels	3,106	1,353	991	4,020	15,327	24,797
Below 75% of poverty	404	230	101	623	2,332	3,690
Below 100% of poverty	539	304	135	825	3,105	4,908
Below 130% of poverty	709	400	179	1,093	4,098	6,749
Below 185% of poverty	**1,011**	**570**	**261**	**1,561**	**5,903**	**9,306**

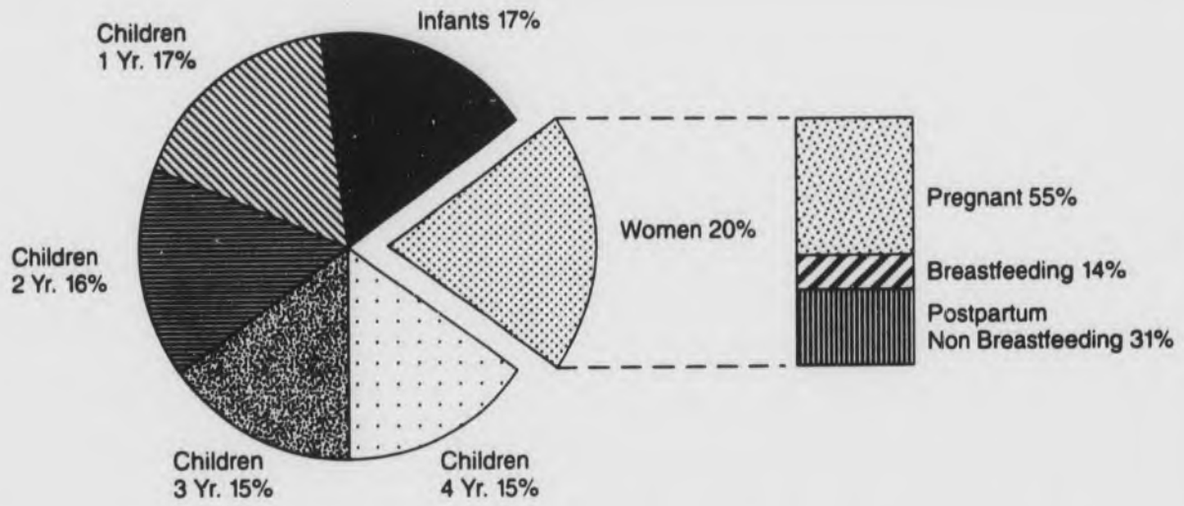


Figure 1. Distribution of WIC Income Eligibles by Category in 1989

Includes U.S. (50 states and DC) Puerto Rico, Virgin Islands & Guam

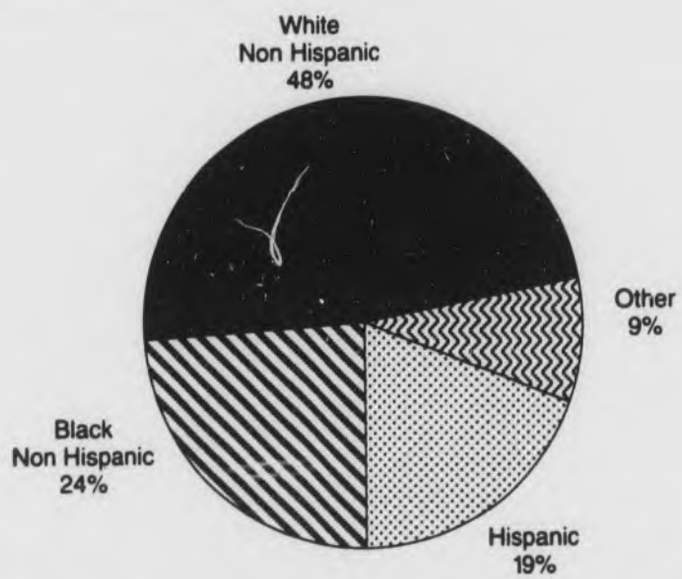


Figure 2. Distribution of WIC Income Eligibles by Race/Ethnicity in 1989

Includes U.S. (50 states and DC), Puerto Rico, Virgin Islands & Guam

Table 2. **Estimates of the Number of Women, Infants and Children Income Eligible for the WIC Program in 1989 [Numbers in Thousands]**

State	Women			Infants age:<1 Year	Children age: 1 - 4 Years	All WIC Groups
	Pregnant Women	Postpartum Non-Breastfeeding	Breastfeeding			
Alabama	18.4	10.7	4.6	28.1	107.6	169.4
Alaska	3.3	1.9	0.9	5.1	18.5	29.7
Arizona	19.6	10.8	5.1	29.6	108.4	173.5
Arkansas	12.0	6.9	2.9	18.1	70.9	110.8
California	132.4	72.1	35.2	205.7	736.8	1,182.2
Colorado	12.3	7.1	3.3	19.0	75.2	116.9
Connecticut	6.6	3.8	1.8	10.3	40.0	62.5
Delaware	1.8	1.0	0.5	2.9	11.5	17.7
District of Columbia	3.1	1.7	0.8	4.5	13.4	23.5
Florida	47.2	27.0	12.4	74.1	280.2	440.9
Georgia	29.2	17.0	7.2	44.7	164.1	262.2
Hawaii	4.3	2.5	1.2	6.9	24.8	39.7
Idaho	5.0	2.9	1.4	7.8	30.9	48.0
Illinois	40.3	22.6	10.3	60.8	231.3	365.3
Indiana	18.5	11.0	4.9	29.5	116.0	179.9
Iowa	9.0	5.3	2.5	14.5	58.5	89.8
Kansas	9.0	5.3	2.4	14.2	57.1	88.0
Kentucky	16.9	9.7	4.1	25.7	99.2	155.6
Louisiana	25.6	14.2	6.3	37.4	144.6	228.1
Maine	3.4	2.0	0.9	5.7	24.9	36.9
Maryland	11.1	6.5	3.0	18.5	71.2	110.3
Massachusetts	14.1	7.9	3.8	21.6	85.7	133.1
Michigan	38.4	21.6	9.6	57.9	210.6	338.1
Minnesota	12.6	7.2	3.6	20.4	81.1	124.9
Mississippi	16.9	9.5	4.0	24.8	92.0	147.2
Missouri	19.5	11.2	5.0	30.0	118.0	183.7
Montana	3.5	2.0	1.0	5.5	22.8	34.8
Nebraska	5.9	3.4	1.7	9.4	37.2	57.6
Nevada	4.4	2.6	1.2	7.1	25.8	41.1
New Hampshire	2.0	1.2	0.6	3.4	14.6	21.8
New Jersey	16.3	9.3	4.4	25.6	98.8	154.4
New Mexico	10.0	5.5	2.6	15.0	55.3	88.4
New York	64.8	35.8	17.3	97.3	362.4	577.6
North Carolina	25.8	15.3	6.6	40.6	150.0	238.3
North Dakota	2.7	1.6	0.8	4.2	16.7	26.0
Ohio	40.2	22.9	10.2	61.4	238.4	373.1
Oklahoma	14.6	8.3	3.6	22.3	88.1	136.9
Oregon	10.8	6.2	2.9	17.2	65.9	103.0
Pennsylvania	34.7	20.1	9.3	55.2	220.7	340.0
Rhode Island	2.7	1.5	0.7	4.1	16.8	25.8
South Carolina	16.1	9.4	4.1	24.9	92.3	146.8
South Dakota	3.5	1.9	0.9	5.2	21.4	32.9
Tennessee	20.7	12.0	5.1	32.0	120.1	189.9
Texas	91.7	51.5	23.3	137.4	520.3	824.2
Utah	8.9	5.3	2.6	14.3	55.7	86.8
Vermont	1.5	0.9	0.5	2.5	10.7	16.1
Virginia	18.3	10.9	4.9	29.8	113.3	177.2
Washington	16.7	9.7	4.5	27.0	104.3	162.2
West Virginia	7.9	4.4	1.9	11.5	45.6	71.3
Wisconsin	16.1	9.3	4.3	25.0	101.5	156.2
Wyoming	1.9	1.1	0.5	2.9	12.0	18.4
United States	**972.0**	**551.4**	**252.7**	**1,498.8**	**5,683.3**	**8,958.1**
Puerto Rico	37.0	17.8	7.8	59.3	209.5	331.4
Virgin Islands	0.7	0.4	0.2	1.1	4.7	7.1
Guam	0.9	0.4	0.2	1.4	5.9	8.7
US, PR VI & Guam	**1,010.6**	**570.0**	**260.8**	**1,560.6**	**5,903.4**	**9,305.3**

* Columns may not sum to totals due to rounding

for the Special Supplemental Nutrition Program for Women, Infants and Children (WIC) in 1989: National and State Tables.[6] Estimates of persons income eligible for WIC benefits for each county in the United States are presented in *Estimates of Persons Income Eligible for the Special Supplemental Food Program for Women, Infants and Children (WIC) in 1989: County Tables.*[7] The estimates for each county which are presented in the USDA publication include racial/ethnic detail for the population at or below 185 percent of poverty level.

[6] Office of Analysis and Evaluation, Food and Consumer Service. USDA, August 1993.

[7] Office of Analysis and Evaluation, Food and Consumer Service. USDA, August 1993.

3. Data Profile and Estimation Methods

The WIC Eligibility Study II was a multistep process that began with the estimation of the number of persons that met categorical and income criteria for the WIC program. Once these estimates were obtained, estimates of that population who were also at nutritional risk were developed using nutritional risk criteria presented in the 1992 State Plans of Operation compiled by the WIC state-level agencies. The study analyzed nutritional risk criteria that were measurable in national survey data. Data from the 1988 National Maternal and Infant Health Survey (NMIHS) and the Third National Health and Nutrition Examination Survey (NHANES III) were used to assess nutritional risk for the WIC population. Specifically, these data were used to estimate the proportion of persons likely to be at nutritional risk and thus eligible for the WIC program on nutritional as well as categorical and income bases.

Analysis Overview

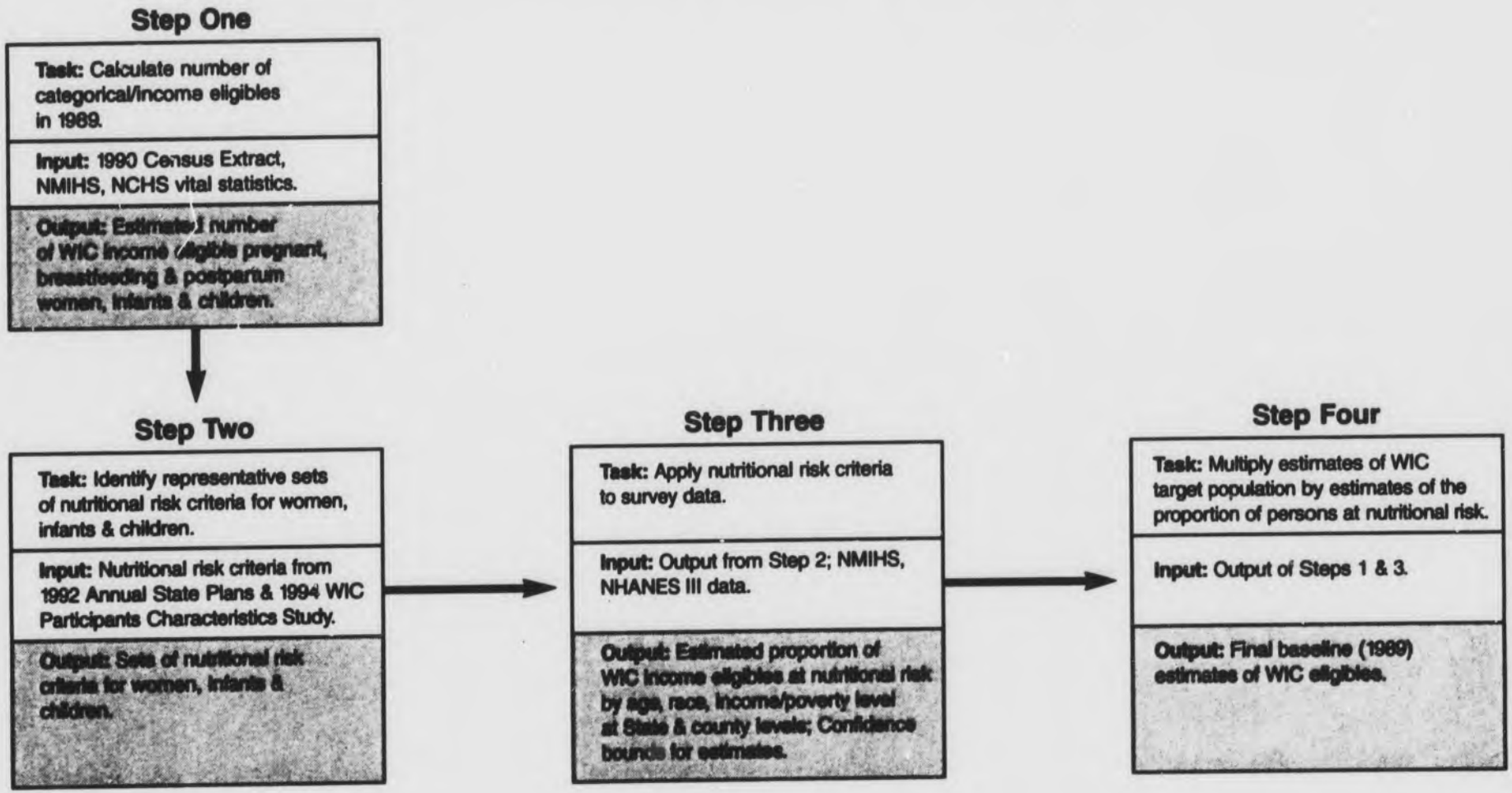
While this report primarily focuses on estimation of categorical and income criteria, Figure 3 and the steps below summarize the entire process for estimating the proportion of persons meeting all WIC eligibility criteria in 1989.

Step 1. The number of categorically and income-eligible persons was determined using a special extract from the 1990 Census, NMIHS data, and National Center for Health Statistics vital statistics data. The output of this step was an estimate of the number of pregnant, postpartum non-breastfeeding, and breastfeeding women and infants and children who were income eligible for WIC benefits in an average month in 1989 in each county and state in the United States and at the national level.

Step 2. The nutritional risk criteria given in the 1992 State Plans were analyzed to identify a common set of nutritional risk criteria used by the 50 states, DC, and the territories.[8] Sets of risk criteria were developed for each categorical group, that is, for women, infants, and children.

[8]The analysis also included an assessment of any changes occurring in State Plans from 1992-1994. These changes were reported as part of the 1994 WIC Participants Characteristics Study. Thus the nutritional risk criteria analyzed reflect those risk criteria used to admit persons into the WIC program in 1994.

Figure 3. Data Flow for Estimates of WIC Eligibility



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Step 3. Using the risk criteria developed in Step 2, the NMIHS and NHANES III survey data were analyzed to estimate the proportion of WIC income-eligible persons likely to be at nutritional risk. The output of this step was the estimated proportion of women, infants, and children in the U.S. population who were at nutritional risk.

Step 4. The estimates of WIC income-eligible persons at the national and state levels (Step 1) were multiplied by the estimated proportion of persons at nutritional risk (Step 3) to calculate the number of persons eligible for WIC at the national and state levels. The output of this step was the estimated number of women, infants, and children in each state and at the national level who met all WIC eligibility criteria in 1989.

Data Sources

Estimation of categorical and income eligibility for the WIC program was based on several data sources. These sources included the special extract of the 1990 Census of Housing and Population which was prepared for the FCS by the Bureau of the Census and survey data from the 1988 National Maternal and Infant Health Survey. Additionally, natality and mortality data from Vital Statistics of the United States prepared by the National Center for Health Statistics (NCHS) were used to estimate the women's categorical groups. Figure 4 presents these sources and describes their contents.

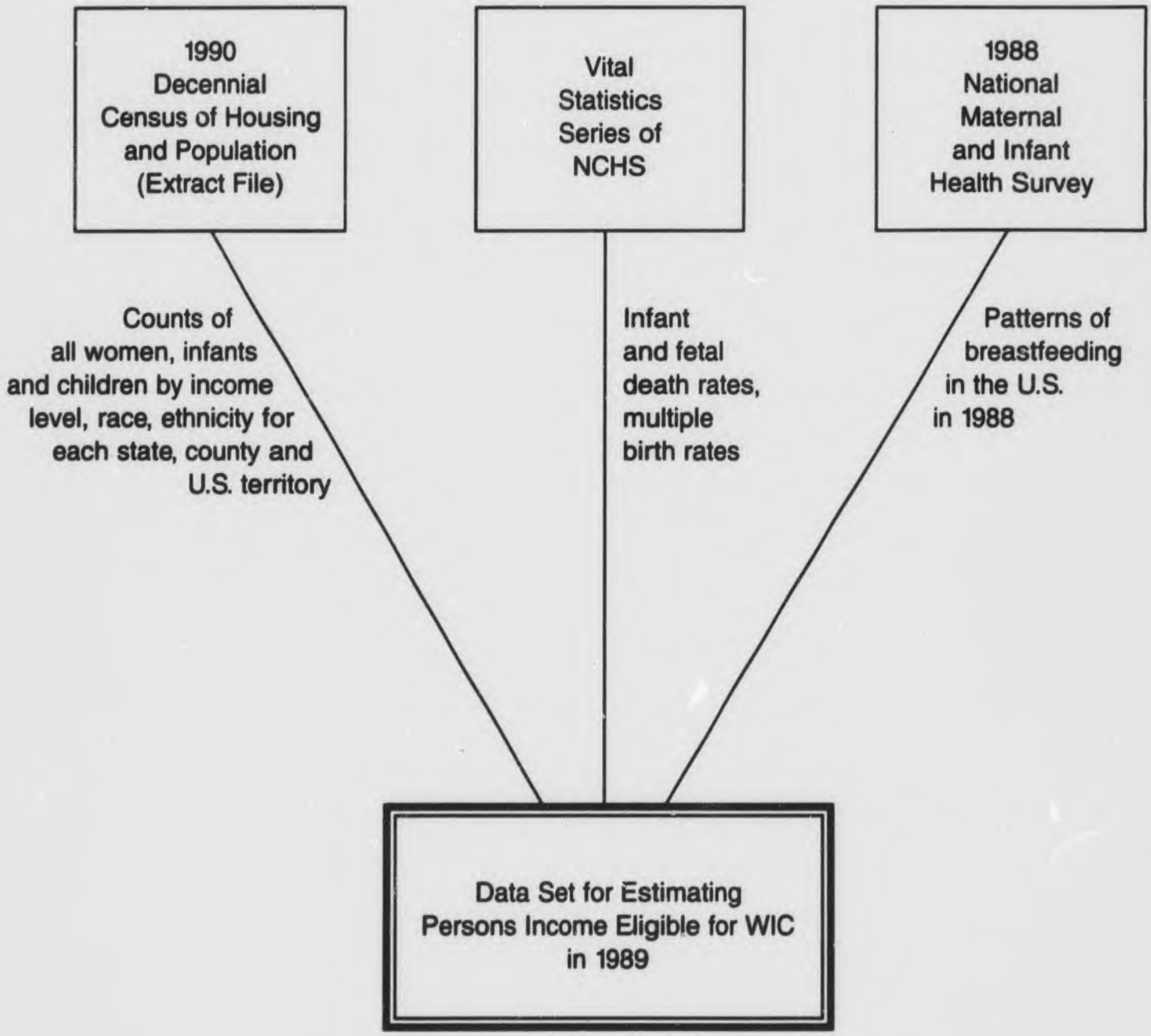
Census of Housing and Population

The Bureau of the Census prepared a special extract of the 1990 Census of Housing and Population for the FCS which contained the following state and county-level counts:

- Infants and children ages 1 to 5 by race/ethnicity and income level.
- Infants and children by race/ethnicity for whom income could not be determined at the time of the Census.[9]

[9] At the time the special Census Extract was prepared for FCS, income could not be determined for 59,355 infants and 238,712 children out of a total of 3.95 million infants and 15.06 million children.

Figure 4. Data Sources for Estimation of Women, Infants and Children Income Eligible for WIC in 1989



- Infants not living with their natural mothers because they were adopted, in foster care, or living with relatives. These counts were by race/ethnicity and income level.

- Women who lived with their infants in the home by maternal age, race/ ethnicity, and income levels based on family size at the time of the Census.

- Women who lived with their infants in the home by maternal age, race/ethnicity, and income levels based on family size prior to the birth of the infant.

In the Census Extract, data were given for six racial/ethnic categories: non-Hispanic White; non-Hispanic Black; non-Hispanic American Indian, Eskimo or Aleut; Asian or Pacific Islander; Hispanic; and non-Hispanic Other. Five income levels were enumerated: persons with incomes below 75 percent of poverty level, persons below 100 percent of poverty level, persons below 130 percent of poverty level, persons below 185 percent of poverty level, and persons at all income levels.[10]

To assist in the estimation of pregnant and postpartum women and to determine the number of persons eligible for WIC because of adjunct eligibility with Medicaid, the Census Extract provided two counts of women with infants. The first count was of the number of women with infants who fell below 185 percent of poverty level at the time of the Census. The second count of women living in household below a given poverty level was made by simulating the family size prior to the birth of the infant, (i.e. by subtracting one from the reported family size at the time of the Census).

National Maternal and Infant Health Survey

Because the Census does not identify pregnant, postpartum breastfeeding, and postpartum non-breastfeeding women, these categories were estimated by methods that used vital statistics and health survey data along with Census data. The 1988 National Maternal and Infant Health

[10]The Census Extract file defines poverty level as the average of the Annual Poverty Income guidelines in effect between July 1, 1988 and June 30, 1989 (the first half of calendar year 1989) and the guidelines in effect between July 1, 1989 and June 30, 1990 (the second half of calendar year 1989). For a family of four, the average annual income poverty level for calendar year 1989 was $11,875 and the WIC income eligibility cutoff of 185 percent of poverty was $21,969 per year. The levels for families living in Alaska and Hawaii were slightly higher.

Survey is a nationally representative, cross-sectional study of infant births and deaths conducted by the National Center for Health Statistics. The survey examined factors such as adequacy of prenatal care and maternal substance abuse that are related to poor pregnancy outcomes. Participants were selected for the survey on the basis of information from vital records. The mothers who participated in this survey responded to mailed questionnaires. Respondents consisted of women who had live births, fetal deaths, or infant deaths. Hospitals and delivery attendants also completed questionnaires. The completed study provided social and demographic information as well as data on maternal and infant health. It also included information on prenatal care and health habits, delivery of the baby, hospitalizations before and after delivery, previous and subsequent pregnancies, mother's and father's characteristics, family income, and baby's health.

The National Maternal and Infant Health Survey was used to analyze patterns of breastfeeding in the United States in 1989. Life table techniques were used to determine the proportion of women with infants age 0 to 12 months who were breastfeeding their infants and the proportion of women with infants aged 0 to 5 months who were not breastfeeding their infants. The proportion of women who breastfed their infants was calculated on a monthly basis.

Other Data Sources

Mortality and natality data from The Vital Statistics Series from the National Center for Health Statistics were used in the estimation of pregnant and postpartum women to adjust counts of mothers with infants who were living at the time of the Census for infant deaths and fetal deaths.[11] Mortality data were available by race for each state. They were not recorded for different income levels. Appendix A describes the method used to match the racial/ethnic

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[11] See the NCHS, *Vital Statistics of the United States, 1989.* Vol II -- Mortality, Public Health Service, Washington DC. U.S. Government Printing Office, 1993. See also the NCHS, 'Advance report of final mortality statistics, 1990.' *Monthly Vital Statistics Report*, Vol. 41, No. 7, (Supplement). Hyattsville: MD: Public Health Service. January 7, 1993 as well as NCHS, *Vital Statistics of the United States, 1989.* Vol I-- Natality, Public Health Service, Washington DC. U.S. Government Printing Office, 1993.

groups presented in the National Center for Health Statistics publications with the racial/ethnic groups enumerated in the Census Extract.

Methods for Estimating the Population Income Eligible for WIC in 1989

This section presents the methods which were developed to estimate the number of persons who were income eligible for the WIC program based upon the 1990 Census. The estimation of the size of the population which would be eligible on categorical and income grounds alone requires computational and statistical procedures because pregnancy status and breastfeeding are not directly enumerated in the Census data. This section explains how the estimates of the income-eligible population were derived for the various WIC categorical groups. Appendix B provides a more detailed presentation of this analysis.

Infants and Children

The counts of infants under one year of age and children 1 to 5 years of age were directly enumerated by the Bureau of the Census. The Bureau of the Census provided counts of infants and children in the United States by racial/ethnic group and income level for each county, state, and territory in the United States. Approximately 1.5 percent of these infants and children could not be assigned to an income category because their family income could not be determined. The majority of these infants and children lived with other relatives or were in foster care.[12] The study assumed that all of these infants and children with indeterminant incomes were income eligible for WIC. This assumption was made because infants and children in foster homes and/or children living in group quarters are certified as having no income at the time of income certification in the WIC clinic.[13]

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[12]In the case of infants, 87 percent of the infants whose family income could not be determined lived with their relatives, with non-relatives, or were in foster care. The remaining 13 percent of these infants lived in group home facilities.

[13]The counts of infants and children with indeterminant incomes in each racial/ethnic group were assigned proportionately to the income category (less than 75 percent of poverty, 75-100 percent poverty, 100-130 percent of poverty, 130-185 percent of poverty) based on the income distribution of infants and children with incomes for the particular racial/ethnic group.

The Bureau of the Census found some problems with the accuracy of the ages reported in the 1990 Census. These problems were particularly acute for infants. Respondents tended to report ages and family size as of the date they completed the questionnaires, rather than as of April 1, 1990. Ages of infants in years may have been rounded up to age 1 to avoid reporting an age of 0 years. The latter practice would underestimate the number of infants and overestimate the number of children 1 year of age. The Bureau of the Census only released adjusted counts of infants to FCS because of the size of the misclassification problem in the infants counts and the importance of a reliable estimate of infants for the WIC program. The counts of children were not adjusted by the Bureau of the Census.[14]

Figure 5 shows the method used to count the number of income-eligible infants and children who lived in families with income less than 185 percent of the poverty level. The counts of income-eligible children were computed for each year of age from 1 to 5. This estimation was undertaken for each racial/ethnic group in each county, state, and territory of the United States. In order to assess coverage for different income groups, these counts were presented by income level for each geographic area: less than 75 percent of poverty, less than 100 percent of poverty, less than 130 percent of poverty, and less than 185 percent of poverty.

These estimates of income-eligible infants and children may differ slightly from other published Census data because they:

(1) use income poverty guidelines established by DHHS rather than Census poverty thresholds;

(2) use an adjusted count of infants developed by the Bureau of the Census to account for misclassification of infants less than one year of age; and

(3) include infants and children for whom income could not be determined at the time of the Census.

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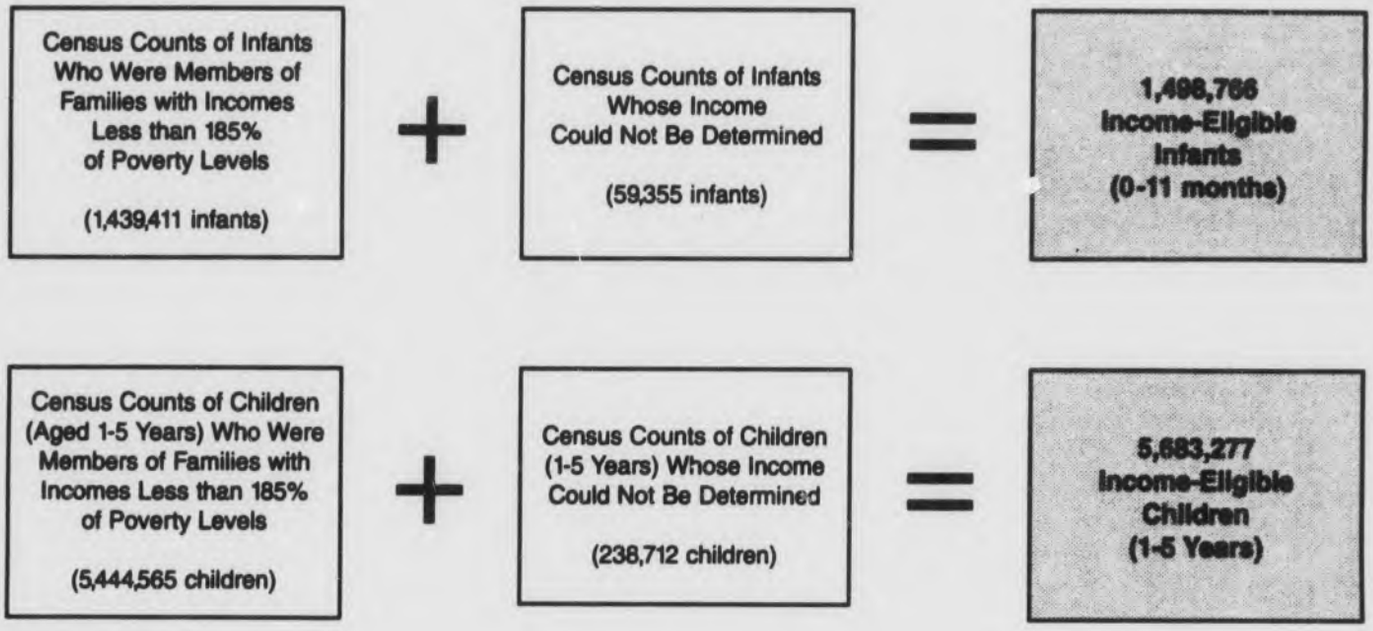
[14]For more information, see the Bureau of the Census, "Age, Sex, Race, and Hispanic Origin Information from the 1990 Census: A Comparison of Census Results with Results Where Age and Race Have Been Modified," 1990 CPH-L-74, August 1991.

Figure 5. Estimation of Infants and Children Income Eligible for the WIC Program in 1989



Pregnant Women

The average number of pregnant women living in families with incomes below the WIC income limit were calculated by estimating the total number of women who were pregnant in 1989 adjusted for the portion of 1989 they were pregnant. This adjustment was needed to determine the number of pregnant women in an average month in 1989, rather than the total number of women who were pregnant at any time in 1989.

Women who were pregnant in 1989 gave birth between January 1989 and September 1990. The number of births during this period was estimated using Census counts of women living with their own infants, infants not living with their mothers, and all infants. Separate estimates were made of the number of births during three segments of this 21-month time period:

- *Births from January 1989 to March 1989.* Children born during this period were 12-14 months old at the time of the Census, and thus are included in the counts of children. A good approximation of children 12-14 months of age is one fourth of the number of one-year-olds. Because of the misclassification of ages in the infant/one-year-old children categories in the Census, the number of children 12-14 months of age was estimated as one-fourth the number of income-eligible infants.[15] This estimate was then adjusted for fetal and infant deaths in order to estimate conceptions from live births, because a solely infant-based estimate would exclude those pregnancies that resulted in a fetal or infant death. A final adjustment was made to account for multiple births in order to avoid double counting mothers of twins, triplets, and other multiple births.[16]

- *Births from April 1989 to March 1990.* Births to income-eligible women during this period were estimated as the sum of (1) the number of mothers living with their own infants who were income eligible when calculated with a family size less than one[17] and (2) the number of income-eligible infants not living with their own mothers. The counts of mothers living with their own infants was adjusted to reflect infant mortality and fetal deaths. The count of infants was also adjusted for infant and fetal deaths and multiple births.

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[15]This assumes a uniform distribution of births throughout 1989-1990.

[16]See Appendix A for additional details on the rates used.

[17]The calculation of income eligibility was made with a family size one less than that at the time of the Census. This was done in order to reflect family size during pregnancy. This was the customary practice in WIC clinics in 1989.

- *Births from April 1990 through September 1990.* Because children born during this period were not yet born at the time of the Census, these births were estimated as one half of the number of income-eligible infants given by the Bureau of the Census. This estimate was then adjusted for fetal and infant deaths and multiple births to reflect conceptions.

These estimates obtained by combining the above births to income-eligible women were then adjusted by the average proportion of the year for which each group of women was pregnant. This adjustment was required to estimate the number of pregnant women in an average month in 1989. For mothers who gave birth in the first quarter of 1989 (January through March 1989), the average duration of pregnancy was 6.5 weeks, or 12.4 percent of the year. For the mothers who gave birth between April 1989 and March 1990, the average number of weeks that the mother was pregnant in 1989 was 31.1 weeks, or 59.7 percent of the year. For the mothers who gave birth between April and September of 1990 (after the Census was taken), the average duration of pregnancy was 13.6 weeks, or 26.1 percent of the year. These calculations of the portion of a year that women were pregnant were used to estimate the number of pregnant women in an average month in 1989. Table B2 in Appendix B presents the derivation of these proportions of 1989 that the women were pregnant.

The number of income-eligible pregnant women was estimated for each racial/ethnic group in each county, state, and territory of the United States. Estimates of pregnant women in an average month of 1989 were computed for these age groups: women under 19 years of age, women aged 19 to 26 years, women 27 to 35 years, and women 36 years and older. For each age group, the racial/ethnic groups were then added to calculate the number of income-eligible pregnant women in each county and state for different income levels.

Figure 6 illustrates the computation of the estimates of income-eligible pregnant women for a given racial/ethnic group at the state level. The figure shows the computation of the number of income-eligible pregnant women for black, non-Hispanic women in the state of New York. This example is done at the state level for a specific racial group to emphasize that the estimates were computed for each racial group within each state. The national estimates were computed as the sum of the state-level estimates.

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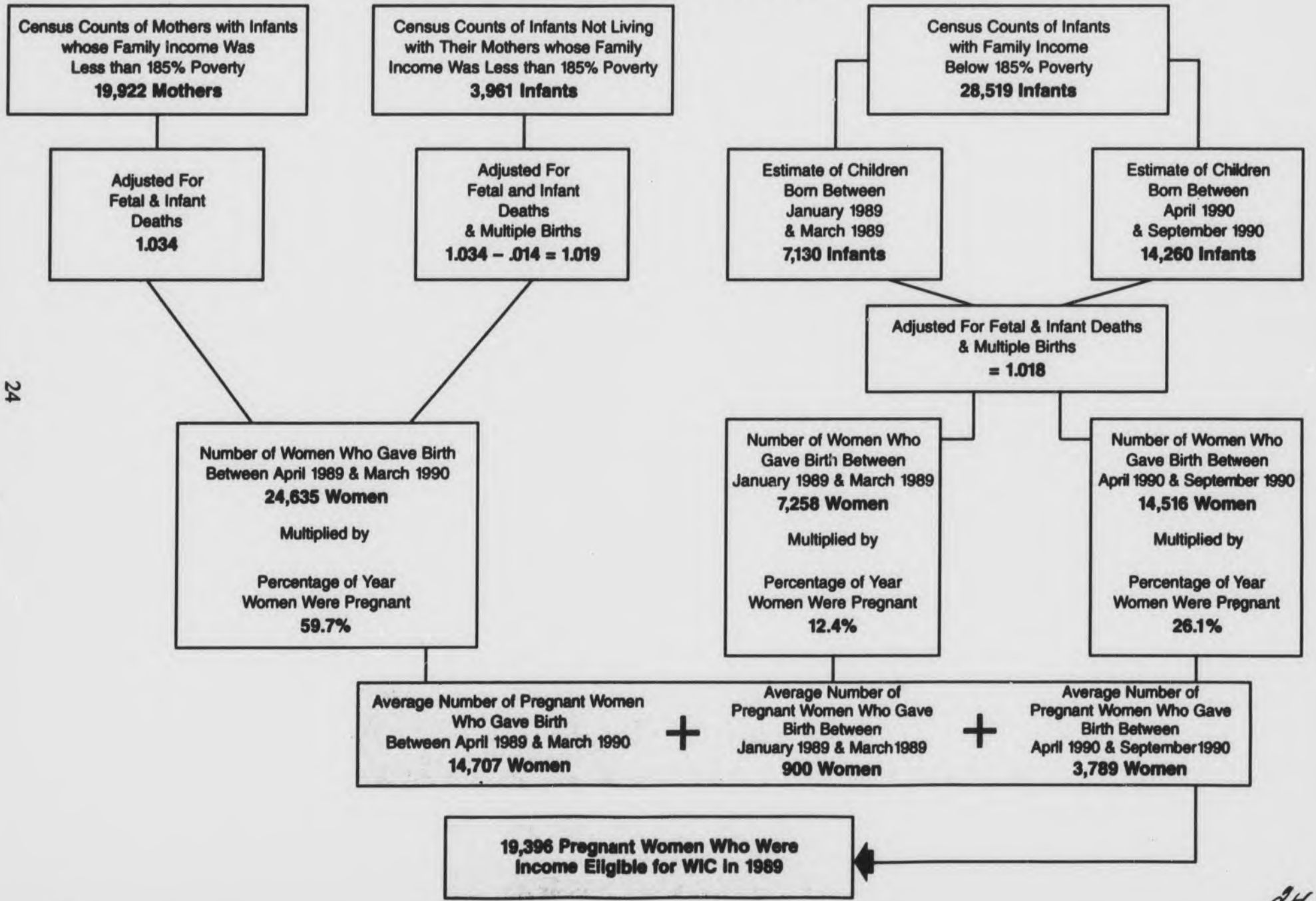
Figure 6. Computation of the Number of Pregnant Women Income Eligible for WIC Benefits in 1989

(Black Non-Hispanic, New York State)



It should be noted that the estimates of income-eligible pregnant women that are based on births from April 1989-March 1990 are based on family size *during pregnancy*. The estimates of income-eligible pregnant women that are based on births from January 1989-March 1989 and April 1990-September 1990 are based on family size *after birth*. This would tend to increase the estimate of income-eligible pregnant women, since more women will be considered income eligible with a larger family size. However, the impact of this effect on the final estimate of income-eligible pregnant women is relatively small. Three-fourths of the national estimate of income-eligible pregnant women is derived from the estimates of births from April 1989-March 1990, which did reflect family size during pregnancy.

Postpartum Women (Breastfeeding and Non-Breastfeeding)

In the WIC program mothers with infants are categorically eligible for the WIC benefits for the six months after the births of their infants whether they are breastfeeding their child or not and for up to twelve months if they continue to breastfeed their infants during the 12 months. The number of income-eligible postpartum (breastfeeding and non-breastfeeding) women was estimated based on (1) counts of income-eligible women with their infants living in the household and (2) counts of infants that did not live with their mothers. This second group included infants living with the father or other relative, living with non-relatives, in foster care, and in group quarters. This latter group is needed to estimate the number of postpartum women who were not living with their infants. These infants who did not live with their mothers would not necessarily have similar incomes to their mothers. Therefore, the number of income-eligible postpartum women not living with their infants was estimated by assuming that their income distribution resembled the income distribution of postpartum women with infants at home for each racial/ethnic group within each state and county. In addition, a small adjustment was made to include those women who experienced a fetal or infant death.[18]

[18]Women whose pregnancies were terminated due to a fetal death are categorically eligible for WIC benefits as non-breastfeeding postpartum women. This group can receive WIC benefits for up to six months following termination of pregnancy. Women whose babies died during infancy are also eligible for WIC benefits. Depending upon how old the infants were when they died, these mothers can receive benefits for up to twelve months.

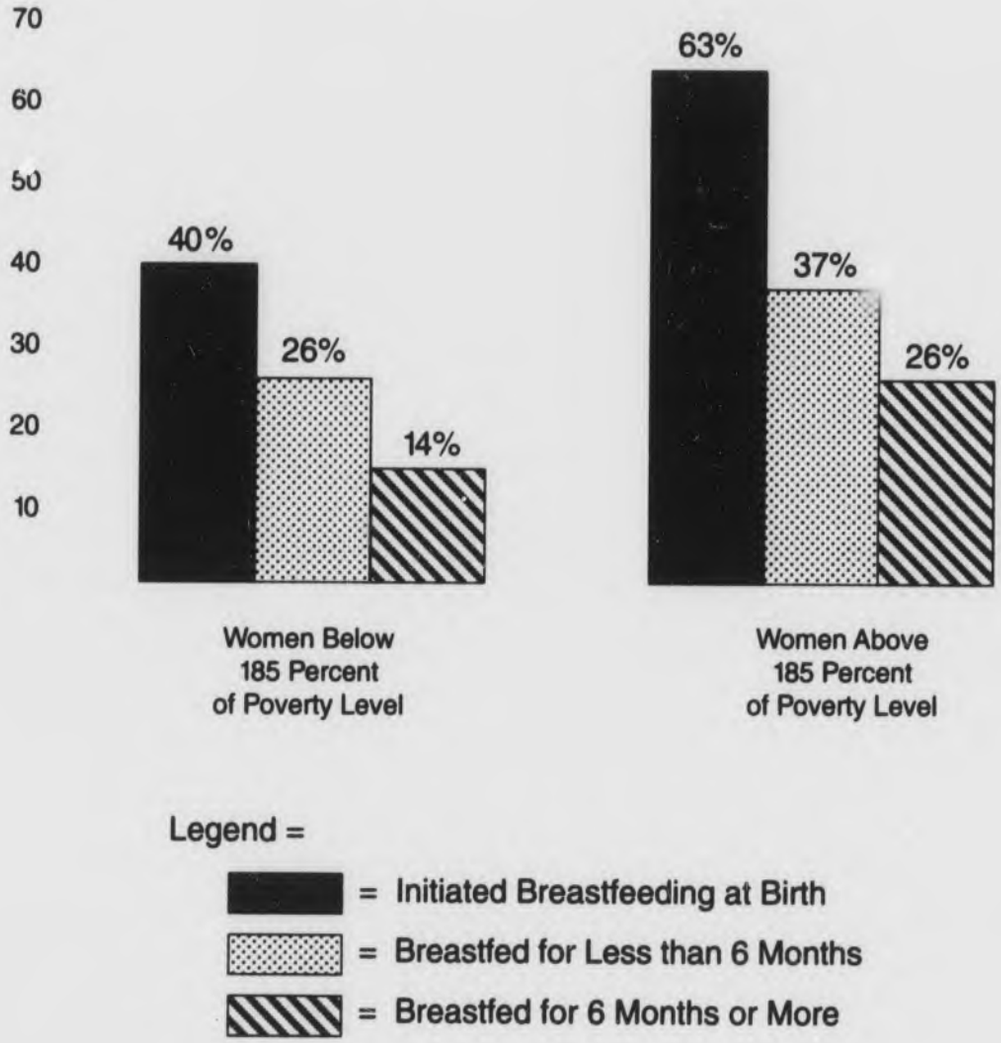
The estimation of the WIC categorical groups of breastfeeding women and non-breastfeeding women required that the counts of all postpartum women be adjusted by the proportions of women who were likely to be breastfeeding for a given duration. Eligibility status of the postpartum mother can change each month, depending upon the duration of breastfeeding. For example, a woman who never breastfed her infant would be categorically eligible as a non-breastfeeding postpartum woman. A woman who breastfed her infant for two months would be categorically eligible as a breastfeeding woman for two months and as a non-breastfeeding woman for four additional months. A woman who breastfed her infant for six months or more would be categorically eligible as a breastfeeding woman until the month that she stopped breastfeeding or the infant's first birthday. This movement from one categorical group to another was taken into account in the estimation of the number of breastfeeding women and postpartum, non-breastfeeding women.

Estimates of the probability that a woman would breastfeed her infant for a given period of time were needed to measure the two postpartum categorical groups, (1) the breastfeeding women up to twelve months postpartum, and (2) the non-breastfeeding women up to six months postpartum. The 1988 National Maternal and Infant Health Survey was analyzed to estimate the probability that a woman was breastfeeding in a given month. Demographic analyses were used to estimate the probability that a mother never breastfed, and the probabilities that she breastfed for one month, two months, three months, and so on, up through the final month of the first year. These estimates of the probability that a woman would breastfeed her infant were computed for different age/income groups in order to account for differences in breastfeeding patterns among different socioeconomic groups of mothers and for compatibility with the data which were available from the Bureau of the Census.[19]

Figure 7 shows that the breastfeeding patterns of mothers in 1989 differed for women in families with income less than 185 percent of poverty and women above 185 percent of

[19] Appendix C contains more details of the analysis of breastfeeding patterns in the United States in 1989. Life table techniques with censored data were used to estimate the proportion of women breastfeeding in each month after birth. In this appendix, the breastfeeding patterns are also examined for different racial/ethnic groups.

Figure 7. Percent of Women in the U.S. Breastfeeding Their Infants in 1989

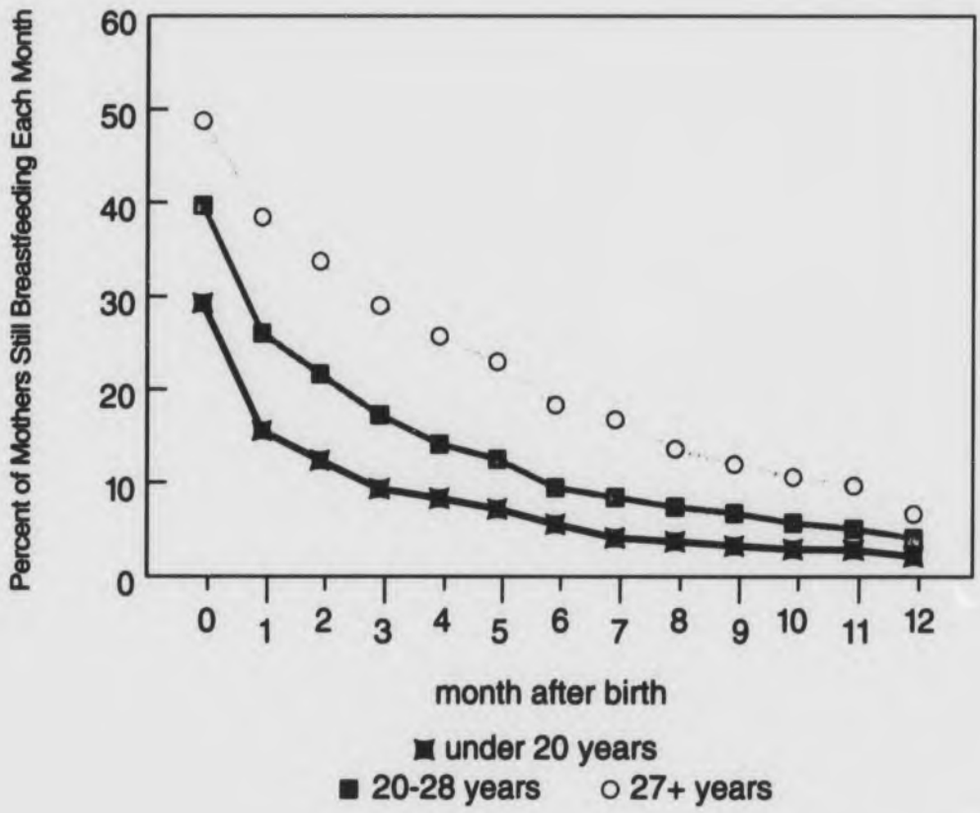


Source: Analyses of National Maternal and Infant Health Survey, 1988.

poverty. Women with incomes below 185 percent of poverty were less likely to initiate breastfeeding and for those who did breastfeed their infant at birth, these women breastfed for shorter duration than women above 185 percent of poverty. The breastfeeding patterns of women also varied by maternal age within each income group. Figure 8 shows that for the women in the WIC income-eligible group, women under 20 years of age were less likely to breastfeed their infants than women over 27 years of age. These younger mothers also breastfed for shorter duration than the mothers who were between 20 and 28 years of age. The estimation of breastfeeding women and non-breastfeeding women who were income eligible for WIC was undertaken by maternal age for each racial/ethnic group and income category in each county and state in the United States. As an example, Figure 9 shows how the estimates of breastfeeding and non-breastfeeding women were computed for white non-Hispanic women in California. The state-level estimates of the number of breastfeeding and non-breastfeeding women were formed by summing the estimates for each racial/ethnic group within the state for each categorical group. The national estimates were computed as the sum of the state-level estimates for each categorical group of women.

Figure 10 shows how significantly the duration of breastfeeding affects the categorical eligibility of postpartum women. Of the 1.47 million postpartum women living in families with incomes below 185 percent of poverty, approximately half were not categorically eligible for WIC benefits because they were not breastfeeding their infants past six months of birth. Breastfeeding women represented one-third of WIC income-eligible women and non-breastfeeding women represented the remaining two-thirds of all income-eligible postpartum women.

Figure 8. Breastfeeding Patterns of Women with Incomes Less Than 185 Percent of Poverty in 1989



Data Source: National Maternal and Infant Health Survey, 1988.

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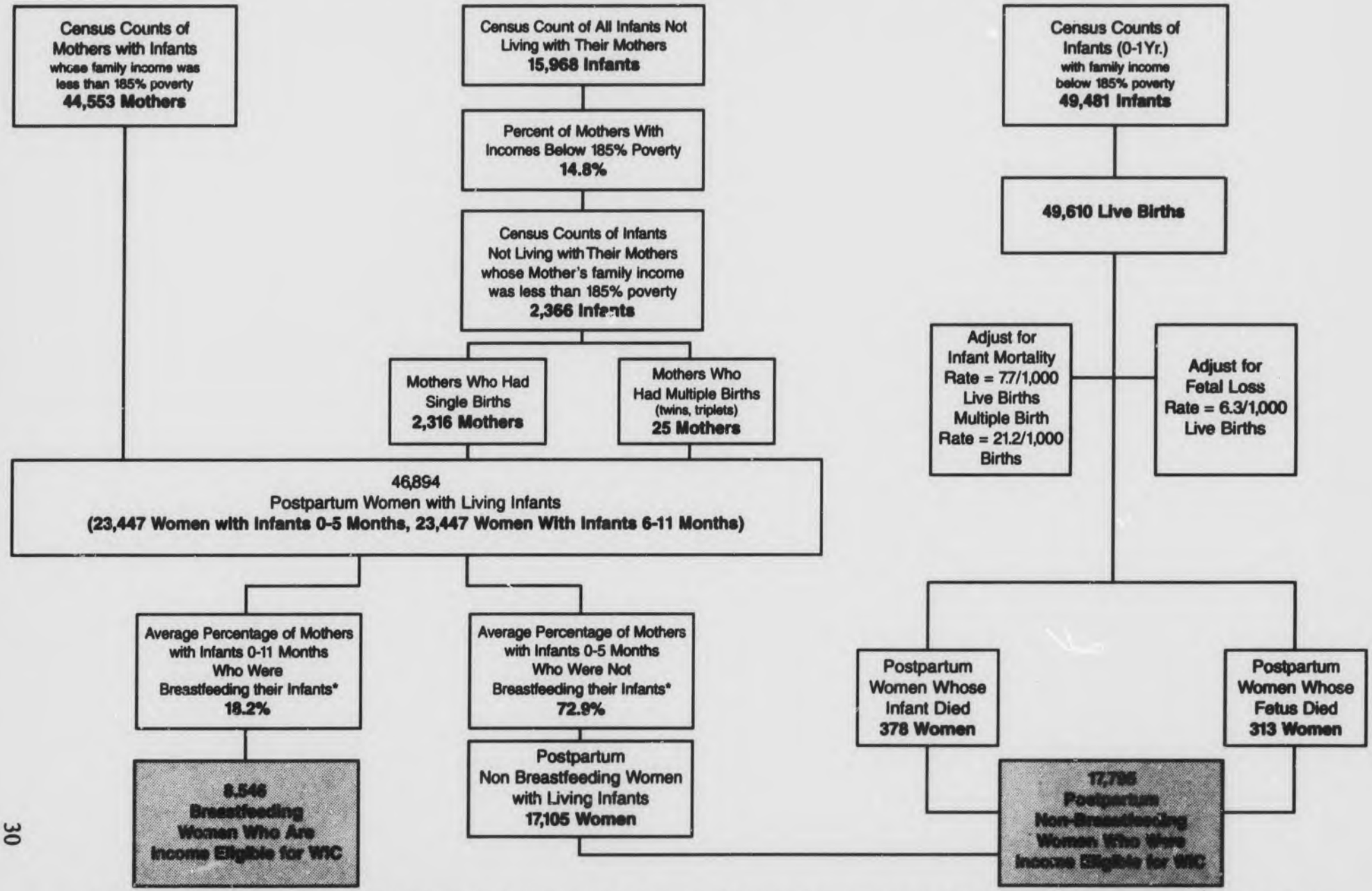
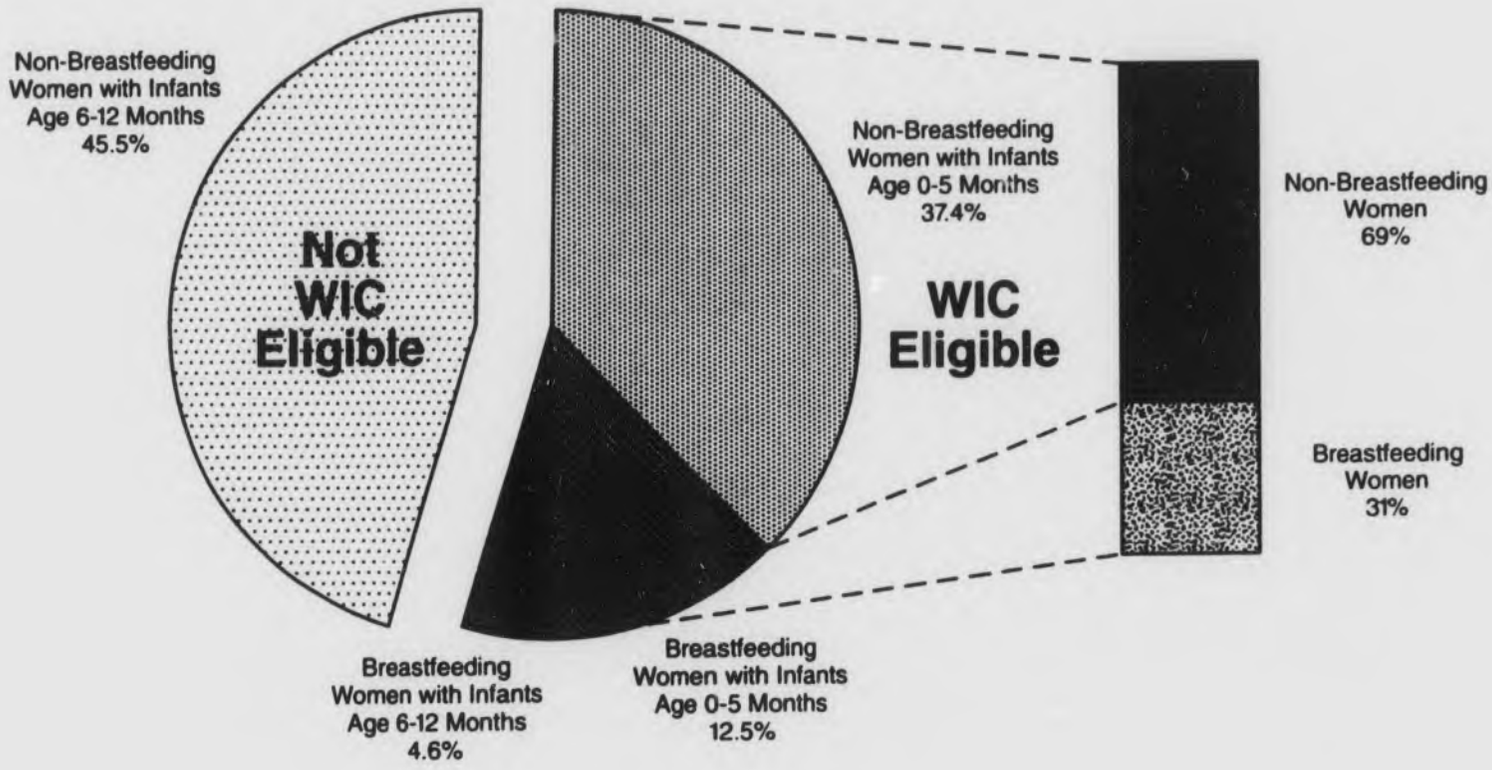
Figure 9. Computation of the Number of Postpartum Breastfeeding and Non-Breastfeeding Women Income Eligible For WIC Benefits in 1989

(White Non-Hispanic, California)



*The percentage of mothers who were breastfeeding (not breastfeeding) was computed for separate age groups (this chart illustrates the average breastfeeding rate only).

Figure 10. Postpartum Women in Families with Income Less Than 185 Percent of Poverty in 1989



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4. Comparisons of the Income-Eligible Population in 1979 and 1989

The estimated number of persons income-eligible for the WIC program grew by 16 percent, from 7.7 million persons estimated in 1979 to 8.96 million persons in the 50 states and the District of Columbia in 1989 based on estimates from Census data. Figure 11 shows that in both 1979 and 1989, four out of five income-eligible persons were infants and children. Although roughly one in five income-eligible persons were women in both 1979 and 1989, there were relatively more income-eligible pregnant women in 1989.

The differences in the estimated WIC income-eligible population from 1979 to 1989 are due to a variety of factors. For infants and children, the large majority of the income-eligible population, the primary source of change was population growth and changes in the economy. For women, the change was due in part to economic and demographic changes and in part to methodological differences between the 1979 and 1989 estimates.

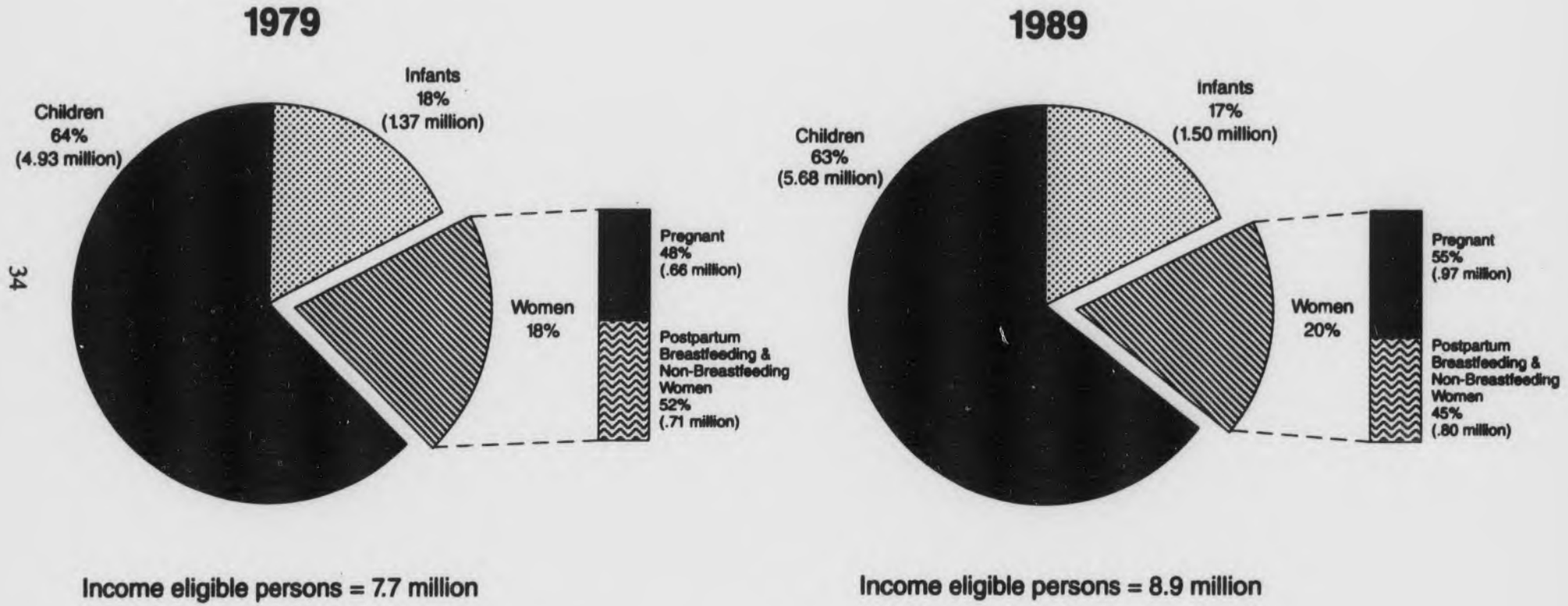
The income distribution of the population income-eligible for WIC changed between 1979 and 1989. Figure 12 shows that in 1989, a greater share of the income-eligible population lived in families with incomes below the federal poverty level than in 1979, (i.e. 53 percent of income-eligible persons had incomes below the poverty level compared to 46 percent in 1979).

Infants and Children

The estimated number of income-eligible infants increased by approximately 9.4 percent, from 1.37 million in 1979 to 1.5 million in 1989. Much of this change was due to a 13.6 percent increase in the total number of infants during that period. This increase in births was offset somewhat because a lower proportion of infants were below 185 percent of poverty in 1989 than in 1979 (38.0 percent versus 39.4 percent).

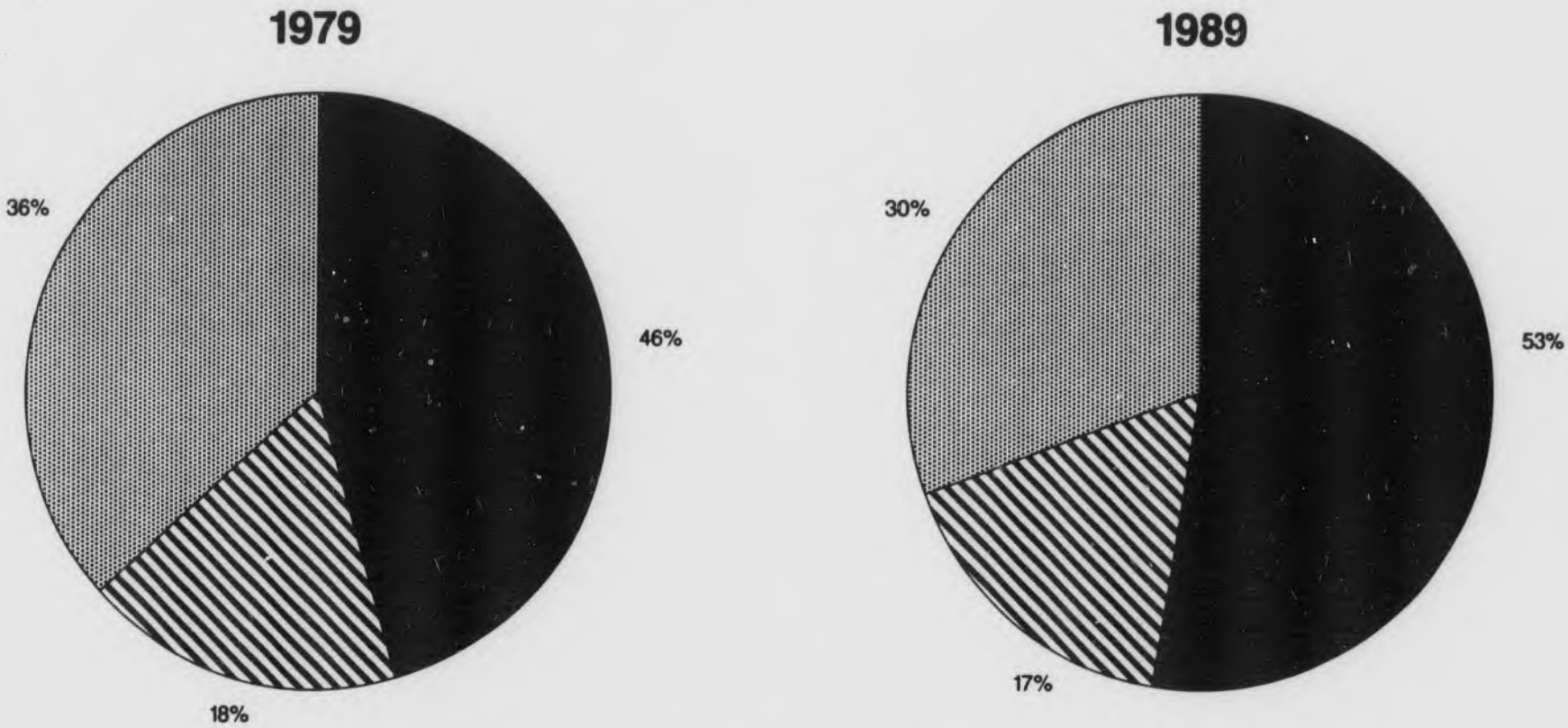
The estimated number of income-eligible children increased by approximately 15.2 percent, from 4.93 million children in 1979 to 5.68 million in 1989. Again, most of this change was

Figure 11. Distribution of WIC Income Eligibles by Category in 1979 and 1989*



*50 states and District of Columbia

Figure 12. Income Distribution of WIC Income Eligibles in 1979 and 1989*



*50 states and District of Columbia

due to the increase in the total number of children-- 19.1 percent during that period. This increase was also offset somewhat because a lower proportion of children were below 185 percent of poverty in 1989 than in 1979 (37.8 percent versus 39.0 percent).

Pregnant Women

The estimated number of income-eligible pregnant women increased by approximately 47 percent from 662,000 in 1979 to 972,000 in 1989. The estimated total number of pregnant women at all income levels increased by nearly 20 percent. The estimated proportion of pregnant women who were income eligible also rose substantially, from 26 percent to 32 percent. These differences are due to both the methodological differences in the estimation and economic/demographic changes from 1979-1989.

Methodological Differences in the Estimation of Pregnant Women

Table 3 shows that the percentage increase in the number of pregnant women at all income levels from 1979-1989 is substantially higher than the overall growth rate for infants (19.6 percent compared to 13.6 percent). However, the total number of pregnant women is directly proportional to the total number of infants, suggesting that the total number of pregnant women should grow at virtually the same rate as the total number of infants. The difference, then, between the 1979 and 1989 estimates of the total number of pregnant women at all income levels is primarily due to changes in the methodology used to estimate pregnant women.

As described in Chapter 3, the 1989 estimate is based on Census counts of mothers living with their infants and infants not living with their mothers. In the 1979 analysis, only counts of mothers living with their infants were used. In the 1989 estimate, the addition of infants not living with their mothers increases the estimated number of total pregnant women by approximately five percent.

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Table 3. Comparison of Estimates of Pregnant Women and Infants in 1979 and 1989

	Infants		Pregnant Women	
	Number '000s	Percentage of Infants Who Were Income Eligible	Number '000s	Percentage of Pregnant Women Who Were Income Eligible
1989				
All incomes	3,945		3,056	
< 185 %	1,499		972	
		38%		**32%**
1979				
All incomes	3,473		2,555	
< 185 %	1,370		662	
		39%		**26%**

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In addition, this methodological change also affects the estimated proportion of pregnant women who were income eligible. Infants not living with their mothers were substantially more likely to be below 185 percent of poverty than were infants living with their mothers (48 percent versus 35 percent). Thus the addition of the infants who were not living with their mothers into the estimate tended to increase the proportion of pregnant women who were estimated as income eligible. This change accounts for approximately half of the increase in the proportion of pregnant women who were estimated to be income eligible. The remaining half of the increase is due to economic and demographic changes in the U.S. population.

Economic and Demographic Changes

The increase in the proportion of pregnant women who were income eligible in 1989 also reflects changes in the economy and changing fertility patterns between 1979 and 1989. The 1989 analysis suggests that more women who were income eligible after the birth of their infant were also income eligible before the birth of the infants. Demographic factors which contribute to this change include the increase in births to unmarried women and Hispanic women.

Fertility rates for unmarried women increased from 29.4 births per 1000 women in 1980 to 43.8 births per 1000 women in 1990. For unmarried teenagers the fertility rate increased from 27.6 per 1000 in 1980 to 42.5 per 1000 in 1990. In 1990, births to unmarried women accounted for nearly 30 percent of all births. Households with unmarried mothers of young children tend to be poorer than the households of married women with young children.[20]

Total fertility rates for Hispanic women are higher than the total fertility rates for women of all racial and ethnic identities: 2900 per 1000 women versus 2626 per 1000 women.[21]

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[20]According to the Annual Demographic File of the 1991 Current Population Survey of the U.S., 75 percent of families with a mother of a child under 5 years of age who had never married lived in families below 185 percent of poverty level compared to 33 percent of families with a mother of a child under 5 years of age who was married or had been married in the past (i.e. separated, divorced, widowed).

[21]The total fertility rate is the number of births that 1,000 women would have in their lifetime if, at each year of age, they experienced the birth rates occurring in the specified year.

Between 1980 and 1990, the share of Hispanics in the U.S. population rose from 6.4 percent to 9 percent. This in part accounted for an overall increase in total fertility from a rate of 2266 in 1980 to 2626 in 1990. The poverty rate for Hispanics is twice the national average. Thus the growth in the Hispanic population and the higher fertility rates of Hispanic women also contributed to a significant increase in the proportion of income-eligible pregnant women.

Postpartum and Breastfeeding Women

The estimated number of income-eligible postpartum women (breastfeeding and non-breastfeeding) increased by 13 percent from 1979 to 1989. There was a significant shift in the proportion of women estimated as breastfeeding. In the 1979 estimate, nearly 50 percent of postpartum women were identified as breastfeeding. In 1989, this share fell to 31 percent. Differences between the 1979 and 1989 estimates of postpartum breastfeeding and non-breastfeeding women are due both to changes in breastfeeding practices and methodological changes.

Breastfeeding Patterns

Table 4 compares the breastfeeding patterns of women between 1980 and 1989. This analysis shows that as estimated from national survey data, the proportion of women who breastfed at birth declined between 1980 and 1990 for women of all incomes (58 percent to 53 percent). For the women below 185 percent of poverty guidelines, the decline in the proportion of women who breastfed was larger. In 1980, women whose incomes were at or below 185 percent of poverty initiated breastfeeding 57 percent of the time. In 1989, this percentage declined to 41 percent. This decline is probably attributable to various factors: increase in mother's employment, increase in teenage pregnancies and unmarried mothers (young mothers tend to not breastfeed), and increase in births to Hispanics and non-whites (who are also less likely to breastfeed). Both in 1980 and 1989, the key determinants of the duration of breastfeeding were maternal age, income, and race.

Table 4. Comparison of Breastfeeding patterns in the US between 1980 and 1990.

	Initiated Breastfeeding at birth	Breastfed for less than 6 months	Breastfed for more than 6 months
1980:			
All Incomes	58%	38%	20%
Women less than 185% poverty	57%		
1990:			
All Incomes	53%	32%	21%
Women less than 185% poverty	40%	26%	14%

Methodological Differences in the Estimation of Breastfeeding Women

In 1979, the WIC Eligibility Study I assumed that a woman was certified as breastfeeding at the birth of her infant and then again at the six-month visit. This means that any woman who stopped breastfeeding at any time during the first six months after birth was classified as breastfeeding in the 1979 analysis. The 1989 analysis, on the other hand, captured actual breastfeeding patterns rather than WIC certification practices. A woman who stopped breastfeeding at any month was assigned to the non-breastfeeding woman's category at that point. Since the proportion of women who breastfeed decreases each month, the number of breastfeeding women declined and the number of non-breastfeeding women increased by the same number as the decline. While this change in methods did not affect the total estimate of postpartum women, it did affect the distribution between breastfeeding and non-breastfeeding women in the postpartum category.

5. Estimating the Effects of Adjunct Eligibility

The Child Nutrition and WIC Reauthorization Act of 1989 required persons eligible for Food Stamps, Aid to Families with Dependent Children (AFDC), and Medicaid, as well as members of families in which a pregnant woman or infant receives Medicaid be considered automatically income eligible for the WIC program. This automatic or adjunct eligibility process streamlines the WIC enrollment procedure by making WIC income determinations unnecessary for some applicants. As in the case of all income eligibles, adjunct eligible persons must meet the categorical criteria and also be at nutritional risk as defined by WIC for admission to the WIC program.

Income-eligibility levels for the Food Stamp program and AFDC are below those in the WIC program. Infants, children under five years of age, pregnant women and postpartum women who would be income eligible for AFDC or the Food Stamp program would be certified to be income eligible for WIC benefits, because AFDC and the Food Stamp program have lower income limits than the WIC program. These persons have already been accounted for in the estimation of WIC eligibles.

Medicaid eligibility guidelines vary considerably across states. They also differ somewhat from income eligibility guidelines in the WIC program and currently are at or above 185 percent of poverty in many states. In addition, the Medicaid income certification process determines family incomes (as a percentage of poverty) for pregnant women by counting each pregnant woman as two persons in determining family size for the income guideline comparison. This is equivalent to determining income eligibility based on the family's income *after the birth of the infant*. This process increases the family size of the pregnant woman, which in turn increases the income limit to determine income eligibility for Medicaid. During the period covered by the analysis, WIC determined income eligibility based on the family size *during pregnancy*.[22] This caused some persons to be adjunctly eligible for WIC

[22]In 1994, PL 103-48 changed the WIC eligibility standards to allow pregnant women who met the income standard with a family size one larger than the current size to participate in the program. For pregnant women, this makes WIC practice more compatible with Medicaid. However, this change only applies to pregnant women. Infants and children living with a pregnant woman who only qualified for WIC at family size plus one would continue to

benefits at family incomes higher than the WIC standard of 185 percent of the poverty income guideline. For example, in 1989 the annual income cutoff level for a family of three with a pregnant woman in the household to be eligible for WIC was $21,474 whereas the comparable Medicaid income threshold for the same family would be $25,829.[23] Figure 13 compares the WIC and Medicaid income thresholds for families with pregnant women.

Unlike Food Stamps or AFDC adjunct eligibles, Medicaid-eligible persons are not included in the estimation of WIC eligibles if their income fell between the WIC income threshold and the Medicaid income threshold. They are not reflected in the estimates presented in this report, or in FCS's August 1993 publications *Estimates of Persons Income Eligible for WIC in 1989 (National, State and County Tables)*. Appendix D presents a methodology for estimating these additional persons who would be eligible for WIC based on Medicaid adjunct eligibility rules.

Adjunct eligibility procedures for the WIC program were not uniformly implemented until after May 1990 and were not in effect throughout most of 1989. However, the effect of Medicaid adjunct eligibility on the WIC-eligible population was measured by estimating the potential size of the WIC-eligible population had the adjunct eligibility law been in effect in 1989. Because program changes have also taken place in Medicaid, the 1992 Medicaid eligibility rules were used to simulate the potential size of the Medicaid adjunctly eligible population. That is, the size of the adjunct-eligible population was estimated by applying the income thresholds in effect in 1992 to the categorical groups who were eligible in 1989. This analysis identified how many additional persons in each categorical group would have been eligible for WIC in 1989 because they were Medicaid recipients.

Two scenarios were computed. The first scenario assumed that all states used 185 percent of poverty as their Medicaid income limit. The second scenario was based on the 23 states that

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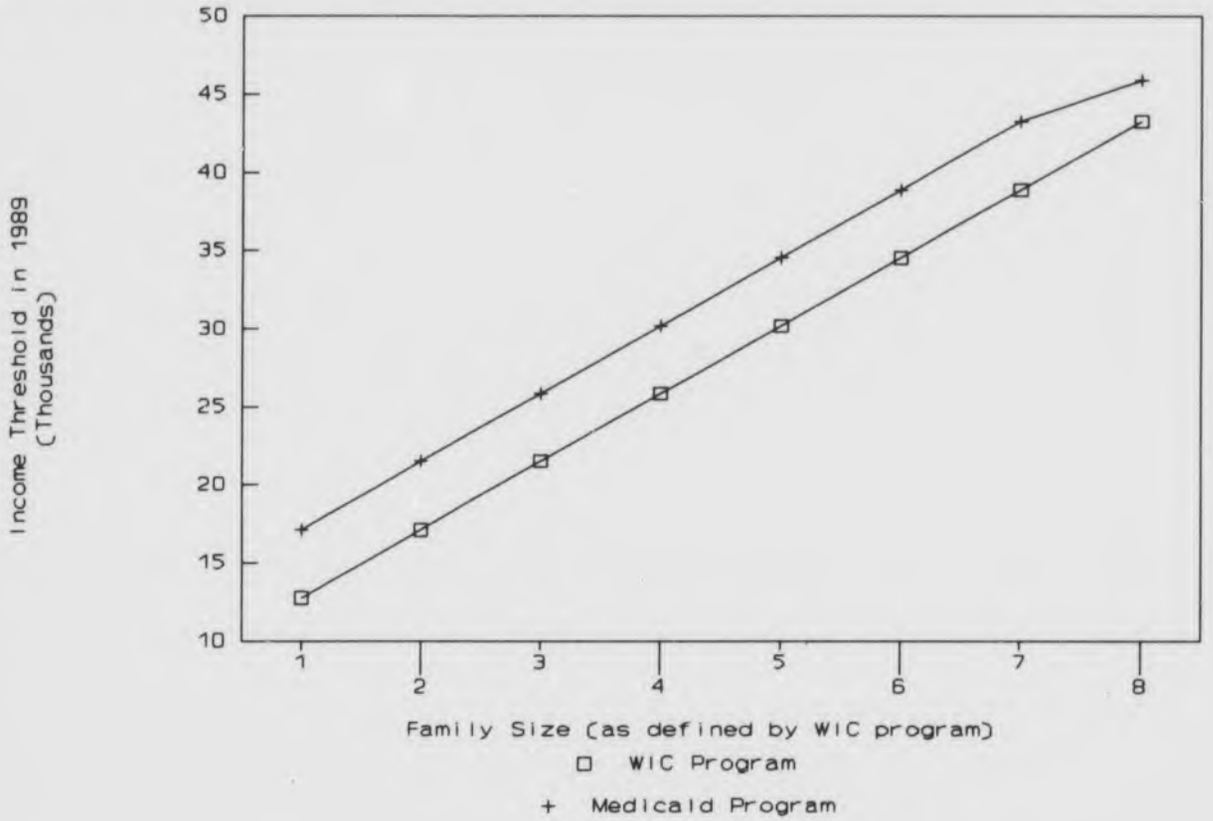
be ineligible for WIC directly and could only participate through Medicaid adjunct eligibility. The number of infants and children affected is small--approximately one to two percent of the total of children under five years of age.

[23]Assumes state uses 185 percent of poverty for Medicaid threshold.

Figure 13. Comparison of Income Thresholds for the WIC and Medicaid Programs



used 185 percent of poverty as their Medicaid income limit in 1992.[24]

Methods of Estimating Medicaid Adjunct Eligibility

The differences in the definition of family size used by the WIC program and Medicaid generate a group of pregnant women, infants, and children who live in families who would be income eligible for Medicaid, but whose incomes are above the WIC income thresholds. The breastfeeding postpartum women and non-breastfeeding postpartum women are not affected for two reasons:

[24]In 1992, 28 states used an income threshold of at or below 155 percent of poverty for eligibility for pregnant women. Persons at or below these levels would already be income eligible for WIC benefits, and in these states no additional persons would be admitted with incomes higher than WIC income thresholds. The remaining 23 states had Medicaid thresholds equal to 185 percent of poverty. For this analysis, we measured the additional persons who would be admitted into WIC because their incomes were between the WIC income threshold and the Medicaid threshold.

(1) the family size of a postpartum woman is defined similarly for the WIC and Medicaid programs, and

(2) postpartum women are not in and of themselves a categorical group for Medicaid.

The WIC categorical groups which are affected by adjunct eligibility due to family size differences alone are pregnant women and infants and children who live in households with pregnant women.

The Census Extract contained two counts of women with their own infants:

- Women who lived with their infant in the home by maternal age, race/ethnicity, and income levels based on *family size prior to the birth of the infant.*
- Women who lived with their infant in the home by maternal age, race/ethnicity, and income levels based on *family size after the birth of the infant* (family size at the time of the Census).

The number of the pregnant women adjunctly eligible for WIC benefits was estimated on an incremental basis by comparing the number of women eligible at 185 percent poverty with family size given as the family size in the Census to the number eligible using family size during pregnancy (one less family member). The effect of Medicaid adjunct eligibility was measured by the difference between these counts of women adjusted for participation in the Medicaid program.

Members of families in which a pregnant woman receives Medicaid are also eligible for automatic certification in the WIC program. If a pregnant woman receives Medicaid, the infants and children under age 5 in her home are automatically eligible for WIC benefits. The number of additional infants and children who were eligible for WIC benefits because their family incomes fell between the WIC cutoff and the Medicaid cutoff was computed by adjusting the number of additional pregnant women whose incomes fell between the Medicaid

limit and the WIC limit by the proportion of pregnant women who also had a child age 1 month to five years of age.[25]

Estimation Results

Two scenarios are presented to measure the effect of Medicaid adjunct eligibility. These scenarios are based on different assumptions concerning the number of states that use 185 percent of poverty as their Medicaid income limit:

- Scenario One: This scenario assumes that all states used 185 percent of poverty as their Medicaid income limit. This scenario represents an upper bound for the incremental proportion of persons who would be adjunctly eligible for the WIC program.

- Scenario Two: This scenario is based on the 23 states that used 185 percent of poverty as their Medicaid income limit in 1992.

Both scenarios assume a 100 percent participation rate for Medicaid-eligible persons. Table 5 presents the estimates of the additional pregnant women, infants, and children who would have been eligible for WIC benefits in 1989 because their household's income was above the WIC income limit but below the Medicaid income limit, as a result of counting pregnant women as two persons in the Medicaid income determination. The results of the first scenario indicate that if adjunct eligibility rules had been in effect in 1989 and all states used 185 percent of poverty as their Medicaid income limit for pregnant women, the incremental number of WIC eligibles would be 138,000 pregnant women, 16,000 infants, and 86,000 children, if all pregnant women who were eligible for Medicaid participated in the

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[25]To calculate the number of infants and children who would have become adjunctly eligible for WIC because their mother was pregnant in 1989, we calculated the proportion of women with two or more children who had infants or children ages 1 - 4 years. This calculation was made using national vital statistics data for 1990 as provided by NCHS. Specifically using information about birth intervals for women with parity equal to or greater than 2, we calculated the proportion of second or greater births that would fall in the birth interval such that the existing child would have been under five years of age during some or all of the mother's pregnancy. This was computed from vital statistics which count the number of births which are spaced within 10-20 months of each other, given that a mother is pregnant for the second, third, etc. time. Eleven percent of births in 1990 with parity equal to or greater than two were 10 to 20 months apart. These calculations allowed for the possibility of more than one child in a household becoming adjunctly eligible as a result of his mother's pregnancy. The proportion of pregnant women that had a child age 12-59 months in the home at any time during her pregnancy is .62 which was derived from birth order and birth interval data from the vital statistics for 1990. Source: Table 19 of *Advance Report on Final Natality Statistics, 1990*, Monthly Vital Statistics Report February 25, 1993.

program. The second scenario is based on the income cutoff limits used in 1992 by the Medicaid program in each state. In this case, 23 states would have an increase in their WIC-eligible pregnant women, infants and children due to adjunct eligibility. In these states, 74,000 additional pregnant women, 8,000 infants, and 46,000 children would have been eligible for WIC benefits.

These scenarios are each an outer bound for the additional number of persons income eligible for WIC because they use 100 percent participation in Medicaid. If persons eligible for Medicaid do not participate in Medicaid, they would not become adjunctly eligible for WIC. The effect of Medicaid adjunct eligibility is therefore mediated by the participation rate in the program. Since the WIC participation rate for pregnant women is likely to be higher than the entire Medicaid population, the choice of a Medicaid participation rate for pregnant women and their infants and children is a matter of judgment because we do not know whether this group of pregnant women would be more or less likely to participate in Medicaid. Appendix D presents alternative scenarios for estimating Medicaid adjunct eligibility assuming various participation rates and state income limits for Medicaid. This appendix also provides additional detail on the methodology used in the Medicaid adjunct eligibility analysis.

In the United States in 1989, had the adjunct eligibility legislation been in effect, the additional pregnant women, infants, and children would have represented from 1 to 2.7 percent of the WIC income-eligible population, overall, depending on the state income cut-off values for Medicaid eligibility and the Medicaid participation rates. The outer bound for the percentage increase in total WIC eligibles arising from all states using 185 percent of poverty as the Medicaid income criterion and from 100 percent participation in Medicaid would not exceed 2.7 percent of all income and categorically eligible persons.

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Table 5. Effect of Medicaid Adjunct Eligibility on the Estimates of WIC Eligible Categories in the United States and US territories(1989)*

	Income-Eligible Pregnant Women in 1989	Additional Income Eligible Persons by Category					
		Pregnant Women in Income Threshold		Infants	Children	Total Additional Eligibles ('000)	Percent Of WIC Income-Eligible Population in 1989
		(%)	Number ('000)	Number ('000)	Number ('000)		
Alternative Scenarios:							
Participation in Medicaid is 100% and all states and territories used 185% of poverty for Medicaid income:							
United States (50 states and DC):	**972.0**	14.2%	**138.4**	**15.6**	**86.1**	**240.0**	2.7%
United States (50 states and DC) and Puerto Rico. Virgin Islands, and Guam:	**1,010.6**	13.9%	**140.2**	**15.8**	**87.3**	**243.2**	2.6%
Participation in Medicaid is 100% and 23 states used 185% of poverty(1992 eligibility):							
United States (50 states and DC):	**972.0**	7.6%	**73.9**	**8.3**	**46.0**	**128.2**	1.4%
United States (50 states and DC) and Puerto Rico. Virgin Islands, and Guam:	**1,010.6**	7.3%	**73.9**	**8.3**	**46.0**	**128.2**	1.4%

* Estimates Derived by assuming Alternative State-Level Income Criteria for Medicaid Eligibility and 100 % Medicaid Participation Rates

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Appendix A

Infant Mortality and Fetal Loss Rates (1988-1990)

Appendix A. Infant Mortality and Fetal Loss Rates (1989-1990)

This appendix describes how the available National Center for Health Statistics (NCHS) vital statistics data on infant mortality and fetal loss were used to produce infant mortality and fetal loss estimates for the categories delineated in the 1990 Census Extract racial/ethnic categories. Infant mortality and fetal loss rates were used to compute an estimate of the number of pregnant and postpartum women in each state for the WIC Eligibility Study II. These rates were needed at the same level of disaggregation given in the Census Extract on which the WIC eligibility estimates are based. The Census Extract for the WIC Eligibility Study II is tabulated into seven racial/ethnic categories: All Origins White, Non-Hispanic Black, Non-Hispanic, Non-Hispanic American Indian, Eskimo, and Aleut, Non-Hispanic Asian and Pacific Islander Hispanic and Non-Hispanic Other. The vital statistics published by NCHS are not tabulated, for infant mortality and fetal loss, with these specific categories on a state-by-state basis.[1] They are tabulated for the following racial groups:

- All races
- White
- Black
- Other races.

Prior to matching the vital statistics data with the Census data, several problems had to be solved:

(1) The NCHS data available did not provide accurate state-level infant mortality rate estimates for Hispanics as a separate category in seven states.

(2) The NCHS data available did not provide state-level estimates of infant mortality for the Native American and Asian/Pacific Islander populations for the years required by WIC Eligibility Study II. The data is available at the national level.

(3) Fetal loss data for the relevant years were available only for the following categories: All Origins, White, Other, and Black within Other.

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[1] NCHS, *The Vital Statistics of the United States*. (Annual publication) Hyattsville, MD: Public Heath Service. and NCHS's advance publication of final results in *Monthly Vital Statistics Report*, Hyattsville, MD Public Health Service.

Furthermore, infant mortality rates for 1990 were only available at the all origins aggregation and fetal loss data were not available for 1990.

The first problem, lack of estimates of infant mortality rates for Hispanics in seven states, was solved by estimating the Hispanic rate by multiplying the state-specific infant mortality rate for White and Non-Hispanics by the ratio of the national rate for Hispanics relative to the national rate for the White ethnic category.[2] This was deemed an adequate proxy given that at the national level in 1989, the Hispanic infant mortality rate was only 5 percent higher than the rate for White Non-Hispanics. This imputation implies that states with a higher than average mortality rate for White infants would also have a higher than average mortality rate for Hispanic infants. These estimates were then assigned to the seven states for which NCHS did not report reliable infant mortality data for Hispanics. For the other 43 states and the District of Columbia, it was possible to calculate a separate estimate for Hispanics as a whole and to adjust the other rates accordingly.

The second problem, the aggregation of Asian and Pacific Islanders, Native Americans, and Others into one residual category, was solved as follows:

(a) In those states where either the Asian/Pacific Islander group or the Native American (American Indian, Eskimo and Aleut) group were predominant, the infant mortality rate corresponding to the Other Non-Hispanic aggregate group was applied to the predominant group and the national average was applied to the non-predominant group. The rate for Non-Hispanic Other remained unchanged.

(b) For those states in which no one group was predominant, the Non-Hispanic Other rate was applied to all three groups.

A heuristic rule was used in the computation of which group was predominant. An ethnic category was judged predominant within the Non-Hispanic Other aggregate when the 1990 population of women with own infants in this state represented 75 percent or more of the

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[2] According to the technical note in NCHS, Advanced Report of Final Mortality Statistics, 1989, Monthly Vital Statistics Report; Vol 40. No. 8, Supplement 2. Hyattsville MD: Public Health Service 1992, these seven states for 1989 were Connecticut, Louisiana, Maryland, New Hampshire, Oklahoma, Rhode Island, and Virginia.

total population of the Non-Hispanic Other Aggregate (Native Americans, Asian/Pacific Islanders or Other) in the Census Extract.

This set of rules and computations make maximal use of the state-level data that are available and preserve relationships that can be accurately estimated at the national level. The resulting calculations are significantly better than imputing national averages in all cases. The use of population weights within states insures that the state-by-state desegregation into ethnic categories remains consistent with the state-level infant mortality rate for All Origins. The eligibility estimates developed from these rates are accurate at the state level and closely patterned on the racial/ethnic mix within each state.

Fetal loss estimates were needed for 1988, 1989, and 1990 for the seven racial categories available in the Census Extract. A simplified rule was used for distributing the published rates into the specific ethnic/racial categories. First, using the population weights for Non-Hispanic Black, and the sum of the population weights for Non-Hispanic American Indian, Eskimo and Aleut, and Asian/Pacific Islander), we solved for the fetal loss rate for Non-Black Other. The following equivalence table was then used to distribute the rates to the specific racial ethnic groups:

NCHS Vital Statistics Groups		WIC Eligibility Study II Census Groups
All Origins	to	All Origins.
White	to	Non-Hispanic White and Hispanic.
Black	to	Non-Hispanic Black.
Other (Non-Black)	to	Non-Hispanic American Indian, Eskimo, Aleut and Non-Hispanic Asian Pacific Islander and Non-Hispanic Other.

At the time the analysis was completed, the NCHS state-level infant mortality rate for 1990 was not available for each racial/ethnic group. The 1990 infant mortality rate for All Origins was used to calculate a rate of change since 1989 in the overall state-level infant mortality rate for each state. The racial/ethnic group specific rates for 1990 were estimated by applying the overall rate of change since 1989 to the 1989 racial/ethnic specific rates. Likewise, in

order to extend the fetal mortality data to 1989, the 1988 fetal infant mortality data for All Origins was used to calculate a rate of change in the overall state-level infant mortality rate between 1989 and 1988. This percentage change at the state level was used to estimate the 1989 racial/ethnic specific rates.

Data for the U.S. territories of Guam, Puerto Rico, and the Virgin Islands were available for 1988. Since the Census data for the territories were not separated by racial groups, there was no need to disaggregate the infant and fetal mortality data. In order to estimate the infant mortality and fetal mortality rates for 1989, the change in the 1988 -1989 rates for all races for the United States was applied to the 1988 rates for the territories. The resulting table of infant mortality and fetal loss rates by racial/ethnic groups for both states and U.S. territories follows.

Table A1. WIC Eligibility Study

Infant Mortality and Fetal Mortality Rates by Racial/Ethnic Group

Census Extract Racial/ Ethnic Origin	1989 Infant Mortality Rate	1990 Infant Mortality Rate	1988 Fetal Loss Rate	1989 Fetal Loss Rate
UNITED STATES				
All Origins	9.8	9.2	7.5	7.5
White, Non-Hispanic	8.0	7.5	6.4	6.4
Black, Non-Hispanic	18.9	17.8	12.9	12.8
Am.Indian, Eskimo & Aleut, Non-Hispanic	12.4	11.7	6.6	6.1
Asian & Pacific Islander, Non-Hispanic	6.2	5.8	6.6	6.1
Hispanic	8.5	7.9	6.4	6.4
Other, Non-Hispanic	4.8	4.5	6.6	6.1
Alabama				
All Origins	12.1	10.2	10.4	10.0
White, Non-Hispanic	9.3	7.9	8.1	7.5
Black, Non-Hispanic	16.9	14.3	14.8	14.8
Am.Indian, Eskimo & Aleut, Non-Hispanic	6.1	5.2	9.5	6.8
Asian & Pacific Islander, Non-Hispanic	6.1	5.2	9.5	6.8
Hispanic	21.2	17.9	8.1	7.5
Other, Non-Hispanic	6.1	5.2	9.5	6.8
Alaska				
All Origins	9.2	10.5	6.1	4.5
White, Non-Hispanic	6.7	7.6	4.4	3.3
Black, Non-Hispanic	9.5	10.9	9.3	6.6
Am.Indian, Eskimo & Aleut, Non-Hispanic	15.2	17.4	9.3	6.6
Asian & Pacific Islander, Non-Hispanic	6.2	7.1	9.3	6.6
Hispanic	3.1	3.6	9.3	3.3
Other, Non-Hispanic	15.2	17.4	9.3	6.6
Arizona				
All Origins	9.2	8.8	6.4	5.4
White, Non-Hispanic	8.5	8.1	6.2	5.2
Black, Non-Hispanic	21.1	20.1	10.4	10.5
Am.Indian, Eskimo & Aleut, Non-Hispanic	8.8	8.4	6.8	5.0
Asian & Pacific Islander, Non-Hispanic	6.2	5.9	6.8	5.0
Hispanic	9.5	9.1	6.2	5.2
Other, Non-Hispanic	8.8	8.4	6.8	5.0

Rates are number of infant deaths or fetal deaths per 1000 live births.
Race Specific Rates calculated from NCHS "Vital Statistics of the United States 1988 & 1989" Tables.

Table A1. WIC Eligibility Study

Infant Mortality and Fetal Mortality Rates by Racial/Ethnic Group

Census Extract Racial/ Ethnic Origin	1989 Infant Mortality Rate	1990 Infant Mortality Rate	1988 Fetal Loss Rate	1989 Fetal Loss Rate
Arkansas				
All Origins	10.2	9.2	8.4	7.4
White, Non-Hispanic	8.3	7.5	6.6	6.2
Black, Non-Hispanic	15.3	13.8	14.2	10.6
Am.Indian, Eskimo & Aleut, Non-Hispanic	3.4	3.1	4.1	15.6
Asian & Pacific Islander, Non-Hispanic	3.4	3.1	4.1	15.6
Hispanic	3.1	2.8	6.6	6.2
Other, Non-Hispanic	3.4	3.1	4.1	15.6
California				
All Origins	8.5	7.9	6.8	6.7
White, Non-Hispanic	7.7	7.1	6.2	6.3
Black, Non-Hispanic	18.8	17.4	12.1	11.7
Am.Indian, Eskimo & Aleut, Non-Hispanic	12.4	11.5	6.1	5.9
Asian & Pacific Islander, Non-Hispanic	6.2	5.7	6.1	5.9
Hispanic	7.6	7.1	6.2	6.3
Other, Non-Hispanic	6.2	5.7	6.1	5.9
Colorado				
All Origins	8.7	8.8	7.6	7.2
White, Non-Hispanic	8.0	8.0	7.2	6.8
Black, Non-Hispanic	16.2	16.3	13.0	11.6
Am.Indian, Eskimo & Aleut, Non-Hispanic	5.6	5.7	9.2	9.8
Asian & Pacific Islander, Non-Hispanic	5.6	5.7	9.2	9.8
Hispanic	10.5	10.6	7.2	6.8
Other, Non-Hispanic	5.6	5.7	9.2	9.8
Connecticut				
All Origins	8.8	7.9	6.8	7.3
White, Non-Hispanic	7.1	6.4	5.9	6.6
Black, Non-Hispanic	20.2	18.1	12.0	12.1
Am.Indian, Eskimo & Aleut, Non-Hispanic	8.8	7.9	8.9	6.4
Asian & Pacific Islander, Non-Hispanic	8.8	7.9	8.9	6.4
Hispanic	7.5	6.7	5.9	6.6
Other, Non-Hispanic	8.8	7.9	8.9	6.4

Rates are number of infant deaths or fetal deaths per 1000 live births.
Race Specific Rates calculated from NCHS "Vital Statistics of the United States 1988 & 1989" Tables.

Table A1. WIC Eligibility Study

Infant Mortality and Fetal Mortality Rates by Racial/Ethnic Group

Census Extract Racial/ Ethnic Origin	1989 Infant Mortality	1990 Infant Mortality	1988 Fetal Loss	1989 Fetal Loss
Delaware				
All Origins	11.8	10.1	6.1	7.5
White, Non-Hispanic	8.7	7.4	5.5	6.2
Black, Non-Hispanic	18.3	15.6	8.3	11.5
Am.Indian, Eskimo & Aleut, Non-Hispanic	6.1	5.2	2.5	6.7
Asian & Pacific Islander, Non-Hispanic	6.1	5.2	2.5	6.7
Hispanic	12.5	10.7	5.5	6.2
Other, Non-Hispanic	6.1	5.2	2.5	6.7
District of Columbia				
All Origins	22.9	20.7	12.7	13.5
White, Non-Hispanic	14.4	13.0	10.2	10.8
Black, Non-Hispanic	25.7	23.3	14.2	15.1
Am.Indian, Eskimo & Aleut, Non-Hispanic	12.4	11.2	13.2	14.0
Asian & Pacific Islander, Non-Hispanic	0.0	0.0	13.2	14.0
Hispanic	6.8	6.2	10.2	10.8
Other, Non-Hispanic	0.0	0.0	13.2	14.0
Florida				
All Origins	9.8	9.6	8.6	8.3
White, Non-Hispanic	7.9	7.7	6.7	6.7
Black, Non-Hispanic	15.3	15.0	14.6	13.4
Am.Indian, Eskimo & Aleut, Non-Hispanic	12.4	12.1	8.2	9.1
Asian & Pacific Islander, Non-Hispanic	5.2	5.1	8.2	9.1
Hispanic	9.9	9.6	6.7	6.7
Other, Non-Hispanic	5.2	5.1	8.2	9.1
Georgia				
All Origins	12.3	12.4	11.3	11.0
White, Non-Hispanic	9.1	9.1	8.4	7.5
Black, Non-Hispanic	18.5	18.6	16.6	17.1
Am.Indian, Eskimo & Aleut, Non-Hispanic	12.4	12.5	8.2	4.5
Asian & Pacific Islander, Non-Hispanic	6.1	6.2	8.2	4.5
Hispanic	6.7	6.7	8.4	7.5
Other, Non-Hispanic	6.1	6.2	8.2	4.5

Rates are number of infant deaths or fetal deaths per 1000 live births.
Race Specific Rates calculated from NCHS "Vital Statistics of the United States 1988 & 1989" Tables.

Table A1. WIC Eligibility Study

Race/Hispanic Origin Specific Infant Mortality and Fetal Mortality Rates

Census Extract Racial/ Ethnic Origin	1989 Infant Mortality Rate	1990 Infant Mortality Rate	1988 Fetal Loss Rate	1989 Fetal Loss Rate
Hawaii				
All Origins	8.3	6.7	9.0	6.9
White, Non-Hispanic	5.0	4.0	10.7	8.2
Black, Non-Hispanic	10.6	8.6	9.0	6.5
Am.Indian, Eskimo & Aleut, Non-Hispanic	12.4	10.1	8.4	6.5
Asian & Pacific Islander, Non-Hispanic	8.9	7.2	8.4	6.5
Hispanic	12.8	10.4	10.7	8.2
Other, Non-Hispanic	8.9	7.2	8.4	6.5
Idaho				
All Origins	9.7	8.7	6.2	7.1
White, Non-Hispanic	9.1	8.2	6.2	7.1
Black, Non-Hispanic	20.4	18.3	6.2	7.1
Am.Indian, Eskimo & Aleut, Non-Hispanic	13.0	11.7	6.2	7.1
Asian & Pacific Islander, Non-Hispanic	13.0	11.7	6.2	7.1
Hispanic	14.4	13.0	6.2	7.1
Other, Non-Hispanic	13.0	11.7	6.2	7.1
Illinois				
All Origins	11.7	10.7	7.4	7.6
White, Non-Hispanic	8.6	7.8	6.1	6.2
Black, Non-Hispanic	21.9	20.0	11.8	12.3
Am.Indian, Eskimo & Aleut, Non-Hispanic	12.4	11.3	6.9	5.2
Asian & Pacific Islander, Non-Hispanic	4.4	4.0	6.9	5.2
Hispanic	10.1	9.2	6.1	6.2
Other, Non-Hispanic	4.4	4.0	6.9	5.2
Indiana				
All Origins	10.2	9.6	7.3	7.5
White, Non-Hispanic	9.0	8.5	6.8	7.0
Black, Non-Hispanic	18.8	17.6	11.8	11.6
Am.Indian, Eskimo & Aleut, Non-Hispanic	12.4	11.6	2.8	4.6
Asian & Pacific Islander, Non-Hispanic	4.4	4.1	2.8	4.6
Hispanic	10.1	9.4	6.8	7.0
Other, Non-Hispanic	4.4	4.1	2.8	4.6

Rates are number of infant deaths or fetal deaths per 1000 live births.
Race Specific Rates calculated from NCHS "Vital Statistics of the United States 1988 & 1989" Tables.

Table A1. WIC Eligibility Study

Infant Mortality and Fetal Mortality Rates by Racial/Ethnic Groups

Census Extract Racial/ Ethnic Origin	1989 Infant Mortality Rate	1990 Infant Mortality Rate	1988 Fetal Loss Rate	1989 Fetal Loss Rate
Iowa				
All Origins	8.3	8.1	6.7	6.3
White, Non-Hispanic	7.7	7.6	6.6	5.9
Black, Non-Hispanic	22.1	21.6	6.7	15.6
Am.Indian, Eskimo & Aleut, Non-Hispanic	13.7	13.4	6.7	12.2
Asian & Pacific Islander, Non-Hispanic	13.7	13.4	6.7	12.2
Hispanic	10.5	10.3	6.7	5.9
Other, Non-Hispanic	13.7	13.4	6.7	12.2
Kansas				
All Origins	8.8	8.4	5.8	6.1
White, Non-Hispanic	7.6	7.3	5.5	5.5
Black, Non-Hispanic	15.6	14.9	9.9	12.4
Am.Indian, Eskimo & Aleut, Non-Hispanic	8.6	8.2	3.4	4.1
Asian & Pacific Islander, Non-Hispanic	8.6	8.2	3.4	4.1
Hispanic	7.6	7.3	5.5	5.5
Other, Non-Hispanic	8.6	8.2	3.4	4.1
Kentucky				
All Origins	9.2	8.5	8.6	7.9
White, Non-Hispanic	8.2	7.5	8.1	7.4
Black, Non-Hispanic	16.2	14.9	12.9	12.7
Am.Indian, Eskimo & Aleut, Non-Hispanic	12.4	11.4	4.0	6.3
Asian & Pacific Islander, Non-Hispanic	8.5	7.9	4.0	6.3
Hispanic	7.1	6.5	8.1	7.4
Other, Non-Hispanic	8.5	7.9	4.0	6.3
Louisiana				
All Origins	11.4	11.1	8.2	8.3
White, Non-Hispanic	8.5	8.3	6.7	6.2
Black, Non-Hispanic	16.0	15.6	10.5	11.5
Am.Indian, Eskimo & Aleut, Non-Hispanic	1.7	1.7	3.4	2.0
Asian & Pacific Islander, Non-Hispanic	1.7	1.7	3.4	2.0
Hispanic	8.9	8.7	6.7	6.2
Other, Non-Hispanic	1.7	1.7	3.4	2.0

Rates are number of infant deaths or fetal deaths per 1000 live births.
Race Specific Rates calculated from NCHS "Vital Statistics of the United States 1988 & 1989" Tables.

Table A1. WIC Eligibility Study

Infant Mortality and Fetal Mortality Rates by Racial/Ethnic Group

Census Extract Racial/ Ethnic Origin	1989 Infant Mortality Rate	1990 Infant Mortality Rate	1988 Fetal Loss Rate	1989 Fetal Loss Rate
Maine				
All Origins	7.4	6.2	6.8	5.6
White, Non-Hispanic	6.5	5.4	6.1	5.5
Black, Non-Hispanic	0.0	0.0	6.8	5.6
Am.Indian, Eskimo & Aleut, Non-Hispanic	16.7	14.0	6.8	5.6
Asian & Pacific Islander, Non-Hispanic	16.7	14.0	6.8	5.6
Hispanic	8.7	7.3	6.8	5.5
Other, Non-Hispanic	16.7	14.0	6.8	5.6
Maryland				
All Origins	10.3	9.5	7.4	7.0
White, Non-Hispanic	8.1	7.5	5.5	4.9
Black, Non-Hispanic	15.9	14.7	11.5	11.7
Am.Indian, Eskimo & Aleut, Non-Hispanic	5.0	4.7	6.1	2.7
Asian & Pacific Islander, Non-Hispanic	5.0	4.7	6.1	2.7
Hispanic	8.5	7.8	5.5	4.9
Other, Non-Hispanic	5.0	4.7	6.1	2.7
Massachusetts				
All Origins	7.7	7.0	6.3	5.8
White, Non-Hispanic	6.7	6.1	5.7	5.3
Black, Non-Hispanic	18.0	16.4	12.7	10.2
Am.Indian, Eskimo & Aleut, Non-Hispanic	12.4	11.3	5.7	6.1
Asian & Pacific Islander, Non-Hispanic	4.7	4.2	5.7	6.1
Hispanic	8.4	7.6	5.7	5.3
Other, Non-Hispanic	4.7	4.2	5.7	6.1
Michigan				
All Origins	11.1	10.7	5.2	5.7
White, Non-Hispanic	8.2	7.9	4.3	4.9
Black, Non-Hispanic	22.9	22.1	9.3	9.2
Am.Indian, Eskimo & Aleut, Non-Hispanic	9.6	9.3	3.8	3.7
Asian & Pacific Islander, Non-Hispanic	9.6	9.3	3.8	3.7
Hispanic	8.7	8.4	4.3	4.9
Other, Non-Hispanic	9.6	9.3	3.8	3.7

Rates are number of infant deaths or fetal deaths per 1000 live births.
Race Specific Rates calculated from NCHS "Vital Statistics of the United States 1988 & 1989" Tables.

Table A1.WIC Eligibility Study

Race/Hispanic Origin Specific Infant Mortality and Fetal Mortality Rates.

Census Extract Racial/ Ethnic Origin	1989 Infant Mortality Rate	1990 Infant Mortality Rate	1988 Fetal Loss Rate	1989 Fetal Loss Rate
Minnesota				
All Origins	7.1	7.3	6.6	6.1
White, Non-Hispanic	6.7	6.9	6.3	5.7
Black, Non-Hispanic	27.1	28.0	12.3	13.4
Am.Indian, Eskimo & Aleut, Non-Hispanic	12.2	12.6	6.9	6.5
Asian & Pacific Islander, Non-Hispanic	12.2	12.6	6.9	6.5
Hispanic	12.5	12.9	6.3	5.7
Other, Non-Hispanic	12.2	12.6	6.9	6.5
Mississippi				
All Origins	11.6	12.1	10.1	9.5
White, Non-Hispanic	8.4	8.8	7.1	5.7
Black, Non-Hispanic	14.3	14.8	13.4	13.7
Am.Indian, Eskimo & Aleut, Non-Hispanic	12.1	12.7	9.2	5.3
Asian & Pacific Islander, Non-Hispanic	12.1	12.7	9.2	5.3
Hispanic	9.0	9.4	7.1	5.7
Other, Non-Hispanic	12.1	12.7	9.2	5.3
Missouri				
All Origins	9.9	9.4	6.7	6.4
White, Non-Hispanic	8.5	8.0	6.1	5.7
Black, Non-Hispanic	17.3	16.4	10.1	9.9
Am.Indian, Eskimo & Aleut, Non-Hispanic	7.2	6.8	6.1	4.9
Asian & Pacific Islander, Non-Hispanic	7.2	6.8	6.1	4.9
Hispanic	4.3	4.1	6.1	5.7
Other, Non-Hispanic	7.2	6.8	6.1	4.9
Montana				
All Origins	11.3	8.6	7.6	7.1
White, Non-Hispanic	8.8	6.7	7.1	6.5
Black, Non-Hispanic	0.0	0.0	7.6	7.1
Am.Indian, Eskimo & Aleut, Non-Hispanic	22.4	17.1	7.6	7.1
Asian & Pacific Islander, Non-Hispanic	6.2	4.7	7.6	7.1
Hispanic	26.4	20.1	7.6	6.5
Other, Non-Hispanic	22.4	17.1	7.6	7.1

Rates are number of infant deaths or fetal deaths per 1000 live births.
Race Specific Rates calculated from NCHS "Vital Statistics of the United States 1988 & 1989" Tables.

Table A1. WIC Eligibility Study

Infant Mortality and Fetal Mortality Rates by Racial/Ethnic Group

Census Extract Racial/ Ethnic Origin	1989 Infant Mortality Rate	1990 Infant Mortality Rate	1988 Fetal Loss Rate	1989 Fetal Loss Rate
Nebraska				
All Origins	7.9	8.3	6.8	6.3
White, Non-Hispanic	6.9	7.2	6.4	5.9
Black, Non-Hispanic	18.9	19.7	14.0	9.6
Am.Indian, Eskimo & Aleut, Non-Hispanic	16.8	17.6	3.7	9.6
Asian & Pacific Islander, Non-Hispanic	16.8	17.6	3.7	9.6
Hispanic	12.0	12.5	6.4	5.9
Other, Non-Hispanic	16.8	17.6	3.7	9.6
Nevada				
All Origins	8.1	8.4	7.8	8.5
White, Non-Hispanic	7.5	7.8	6.9	7.4
Black, Non-Hispanic	19.2	19.9	16.2	18.3
Am.Indian, Eskimo & Aleut, Non-Hispanic	3.2	3.3	6.7	7.6
Asian & Pacific Islander, Non-Hispanic	3.2	3.3	6.7	7.6
Hispanic	5.4	5.6	6.9	7.4
Other, Non-Hispanic	3.2	3.3	6.7	7.6
New Hampshire				
All Origins	8.0	7.1	6.0	6.9
White, Non-Hispanic	8.0	7.1	5.9	6.6
Black, Non-Hispanic	0.0	0.0	8.6	6.9
Am.Indian, Eskimo & Aleut, Non-Hispanic	0.0	0.0	8.6	6.9
Asian & Pacific Islander, Non-Hispanic	0.0	0.0	8.6	6.9
Hispanic	8.4	7.5	8.6	6.6
Other, Non-Hispanic	0.0	0.0	8.6	6.9
New Jersey				
All Origins	9.3	9.0	7.8	7.8
White, Non-Hispanic	6.4	6.2	6.2	6.3
Black, Non-Hispanic	19.5	18.9	13.7	13.6
Am.Indian, Eskimo & Aleut, Non-Hispanic	12.4	12.0	10.5	7.7
Asian & Pacific Islander, Non-Hispanic	4.0	3.8	10.5	7.7
Hispanic	9.1	8.8	6.2	6.3
Other, Non-Hispanic	4.0	3.8	10.5	7.7

Rates are number of infant deaths or fetal deaths per 1000 live births.
Race Specific Rates calculated from NCHS "Vital Statistics of the United States 1988 & 1989" Tables.

Table A1. WIC Eligibility Study

Infant Mortality and Fetal Mortality Rates by Racial/Ethnic Group

Census Extract Racial/ Ethnic Origin	1989 Infant Mortality Rate	1990 Infant Mortality Rate	1988 Fetal Loss Rate	1989 Fetal Loss Rate
New Mexico				
All Origins	8.5	9.0	5.7	4.2
White, Non-Hispanic	7.1	7.5	5.4	3.9
Black, Non-Hispanic	21.6	22.8	7.3	5.5
Am.Indian, Eskimo & Aleut, Non-Hispanic	11.5	12.2	7.3	5.5
Asian & Pacific Islander, Non-Hispanic	6.2	6.6	7.3	5.5
Hispanic	8.2	8.6	7.3	3.9
Other, Non-Hispanic	11.5	12.2	7.3	5.5
New York				
All Origins	10.6	9.6	9.3	10.0
White, Non-Hispanic	7.7	7.0	7.7	8.3
Black, Non-Hispanic	18.3	16.6	15.3	16.4
Am.Indian, Eskimo & Aleut, Non-Hispanic	12.4	11.2	7.2	7.8
Asian & Pacific Islander, Non-Hispanic	4.3	3.9	7.2	7.8
Hispanic	8.8	7.9	7.7	8.3
Other, Non-Hispanic	4.3	3.9	7.2	7.8
North Carolina				
All Origins	11.3	10.6	8.6	8.5
White, Non-Hispanic	8.5	7.9	6.7	6.5
Black, Non-Hispanic	17.8	16.7	13.3	13.1
Am.Indian, Eskimo & Aleut, Non-Hispanic	10.6	9.9	6.5	7.5
Asian & Pacific Islander, Non-Hispanic	10.6	9.9	6.5	7.5
Hispanic	8.7	8.1	6.7	6.5
Other, Non-Hispanic	10.6	9.9	6.5	7.5
North Dakota				
All Origins	8.0	8.0	6.7	6.1
White, Non-Hispanic	6.7	6.7	5.9	6.5
Black, Non-Hispanic	14.5	14.4	6.7	6.1
Am.Indian, Eskimo & Aleut, Non-Hispanic	14.2	14.1	6.7	6.1
Asian & Pacific Islander, Non-Hispanic	6.2	6.2	6.7	6.1
Hispanic	11.4	11.3	6.7	6.5
Other, Non-Hispanic	14.2	14.1	6.7	6.1

Rates are number of infant deaths or fetal deaths per 1000 live births.
Race Specific Rates calculated from NCHS "Vital Statistics of the United States 1988 & 1989" Tables.

Table A1. WIC Eligibility Study

Infant Mortality and Fetal Mortality Rates by Racial/Ethnic Group

Census Extract Racial/ Ethnic Origin	1989 Infant Mortality Rate	1990 Infant Mortality Rate	1988 Fetal Loss Rate	1989 Fetal Loss Rate
Ohio				
All Origins	9.9	9.8	7.0	6.9
White, Non-Hispanic	8.3	8.2	6.4	6.2
Black, Non-Hispanic	18.6	18.4	9.9	10.1
Am.Indian, Eskimo & Aleut, Non-Hispanic	12.4	12.3	6.2	6.4
Asian & Pacific Islander, Non-Hispanic	2.7	2.6	6.2	6.4
Hispanic	12.1	12.0	6.4	6.2
Other, Non-Hispanic	2.7	2.6	6.2	6.4
Oklahoma				
All Origins	8.5	9.2	7.3	8.2
White, Non-Hispanic	7.8	8.4	7.0	7.2
Black, Non-Hispanic	13.8	14.9	10.5	14.8
Am.Indian, Eskimo & Aleut, Non-Hispanic	9.6	10.4	6.8	8.5
Asian & Pacific Islander, Non-Hispanic	9.6	10.4	6.8	8.5
Hispanic	8.2	8.9	7.0	7.2
Other, Non-Hispanic	9.6	10.4	6.8	8.5
Oregon				
All Origins	8.9	8.3	6.0	5.3
White, Non-Hispanic	8.4	7.8	6.0	5.3
Black, Non-Hispanic	24.5	22.8	6.0	5.8
Am.Indian, Eskimo & Aleut, Non-Hispanic	8.6	8.0	6.0	5.8
Asian & Pacific Islander, Non-Hispanic	8.6	8.0	6.0	5.8
Hispanic	11.7	10.9	6.0	5.3
Other, Non-Hispanic	8.6	8.0	6.0	5.8
Pennsylvania				
All Origins	10.2	9.6	8.6	8.8
White, Non-Hispanic	7.7	7.3	7.5	7.6
Black, Non-Hispanic	23.0	21.7	14.6	14.5
Am.Indian, Eskimo & Aleut, Non-Hispanic	12.4	11.7	8.7	9.4
Asian & Pacific Islander, Non-Hispanic	9.4	8.9	8.7	9.4
Hispanic	12.7	12.0	7.5	7.6
Other, Non-Hispanic	9.4	8.9	8.7	9.4

Rates are number of infant deaths or fetal deaths per 1000 live births.
Race Specific Rates calculated from NCHS "Vital Statistics of the United States 1988 & 1989" Tables.

Table A1. WIC Eligibility Study

Infant Mortality and Fetal Mortality Rates by Racial/Ethnic Group

Census Extract Racial/ Ethnic Origin	1989 Infant Mortality Rate	1990 Infant Mortality Rate	1988 Fetal Loss Rate	1989 Fetal Loss Rate
Rhode Island				
All Origins	10.2	8.1	6.9	8.4
White, Non-Hispanic	9.8	7.8	6.5	8.1
Black, Non-Hispanic	18.2	14.5	6.9	10.2
Am.Indian, Eskimo & Aleut, Non-Hispanic	9.4	7.5	6.9	10.2
Asian & Pacific Islander, Non-Hispanic	9.4	7.5	6.9	10.2
Hispanic	10.3	8.2	6.9	8.1
Other, Non-Hispanic	9.4	7.5	6.9	10.2
South Carolina				
All Origins	12.8	11.7	10.7	10.4
White, Non-Hispanic	8.9	8.2	8.5	6.2
Black, Non-Hispanic	18.8	17.2	14.1	16.6
Am.Indian, Eskimo & Aleut, Non-Hispanic	12.4	11.3	14.1	9.4
Asian & Pacific Islander, Non-Hispanic	4.0	3.6	14.1	9.4
Hispanic	9.9	9.0	8.5	6.2
Other, Non-Hispanic	4.0	3.6	14.1	9.4
South Dakota				
All Origins	9.6	10.1	6.5	6.4
White, Non-Hispanic	6.9	7.3	6.1	5.6
Black, Non-Hispanic	13.7	14.5	6.5	9.5
Am.Indian, Eskimo & Aleut, Non-Hispanic	21.9	23.1	6.5	9.5
Asian & Pacific Islander, Non-Hispanic	6.2	6.6	6.5	9.5
Hispanic	10.8	11.4	6.5	5.6
Other, Non-Hispanic	21.9	23.1	6.5	9.5
Tennessee				
All Origins	10.8	10.3	6.5	5.6
White, Non-Hispanic	8.1	7.7	5.1	5.2
Black, Non-Hispanic	14.1	13.5	10.9	6.8
Am.Indian, Eskimo & Aleut, Non-Hispanic	6.3	6.0	8.9	8.8
Asian & Pacific Islander, Non-Hispanic	6.3	6.0	8.9	8.8
Hispanic	12.9	12.3	5.1	5.2
Other, Non-Hispanic	6.3	6.0	8.9	8.8

Rates are number of infant deaths or fetal deaths per 1000 live births.
Race Specific Rates calculated from NCHS "Vital Statistics of the United States 1988 & 1989" Tables.

Table A1. WIC Eligibility Study

Infant Mortality and Fetal Mortality Rates by Racial/Ethnic Group

Census Extract Racial/ Ethnic Origin	1989 Infant Mortality Rate	1990 Infant Mortality Rate	1988 Fetal Loss Rate	1989 Fetal Loss Rate
Texas				
All Origins	9.2	8.1	6.5	6.7
White, Non-Hispanic	7.5	6.6	6.0	6.1
Black, Non-Hispanic	16.7	14.7	10.0	10.3
Am.Indian, Eskimo & Aleut, Non-Hispanic	12.4	11.0	5.0	6.6
Asian & Pacific Islander, Non-Hispanic	6.9	6.1	5.0	6.6
Hispanic	8.3	7.4	6.0	6.1
Other, Non-Hispanic	6.9	6.1	5.0	6.6
Utah				
All Origins	8.0	7.5	5.0	6.1
White, Non-Hispanic	7.5	7.0	5.1	6.1
Black, Non-Hispanic	23.8	22.3	5.0	6.1
Am.Indian, Eskimo & Aleut, Non-Hispanic	14.9	13.9	5.0	6.1
Asian & Pacific Islander, Non-Hispanic	14.9	13.9	5.0	6.1
Hispanic	9.0	8.4	5.0	6.1
Other, Non-Hispanic	14.9	13.9	5.0	6.1
Vermont				
All Origins	6.9	6.4	5.9	5.0
White, Non-Hispanic	6.7	6.2	6.0	5.1
Black, Non-Hispanic	0.0	0.0	5.9	5.0
Am.Indian, Eskimo & Aleut, Non-Hispanic	0.0	0.0	5.9	5.0
Asian & Pacific Islander, Non-Hispanic	0.0	0.0	5.9	5.0
Hispanic	0.0	0.0	5.9	5.1
Other, Non-Hispanic	0.0	0.0	5.9	5.0
Virginia				
All Origins	10.0	10.2	10.1	8.9
White, Non-Hispanic	7.3	7.4	8.0	7.6
Black, Non-Hispanic	18.7	19.1	17.3	13.0
Am.Indian, Eskimo & Aleut, Non-Hispanic	8.0	8.1	5.9	7.3
Asian & Pacific Islander, Non-Hispanic	8.0	8.1	5.9	7.3
Hispanic	7.7	7.8	8.0	7.6
Other, Non-Hispanic	8.0	8.1	5.9	7.3

Rates are number of infant deaths or fetal deaths per 1000 live births.
Race Specific Rates calculated from NCHS "Vital Statistics of the United States 1988 & 1989" Tables.

Table A1. WIC Eligibility Study

Infant Mortality and Fetal Mortality Rates

Census Extract Racial/ Ethnic Origin	1989 Infant Mortality Rate	1990 Infant Mortality Rate	1988 Fetal Loss Rate	1989 Fetal Loss Rate
Washington				
All Origins	9.2	7.8	5.2	5.1
White, Non-Hispanic	8.3	7.1	5.0	5.0
Black, Non-Hispanic	19.8	16.8	9.2	9.7
Am.Indian, Eskimo & Aleut, Non-Hispanic	9.0	7.6	6.2	4.5
Asian & Pacific Islander, Non-Hispanic	9.0	7.6	6.2	4.5
Hispanic	10.8	9.2	5.0	5.0
Other, Non-Hispanic	9.0	7.6	6.2	4.5
West Virginia				
All Origins	9.4	9.9	7.5	8.5
White, Non-Hispanic	9.1	9.6	7.2	8.4
Black, Non-Hispanic	13.4	14.1	7.5	8.5
Am.Indian, Eskimo & Aleut, Non-Hispanic	0.0	0.0	7.5	8.5
Asian & Pacific Islander, Non-Hispanic	0.0	0.0	7.5	8.5
Hispanic	0.0	0.0	7.5	8.4
Other, Non-Hispanic	0.0	0.0	7.5	8.5
Wisconsin				
All Origins	9.1	8.2	6.0	6.6
White, Non-Hispanic	8.2	7.4	5.2	5.9
Black, Non-Hispanic	16.9	15.3	13.8	12.6
Am.Indian, Eskimo & Aleut, Non-Hispanic	8.7	7.9	5.7	6.6
Asian & Pacific Islander, Non-Hispanic	8.7	7.9	5.7	6.6
Hispanic	10.4	9.4	5.2	5.9
Other, Non-Hispanic	8.7	7.9	5.7	6.6
Wyoming				
All Origins	9.4	8.6	7.0	7.6
White, Non-Hispanic	9.3	8.5	7.3	7.1
Black, Non-Hispanic	0.0	0.0	7.0	7.6
Am.Indian, Eskimo & Aleut, Non-Hispanic	7.2	6.6	7.0	7.6
Asian & Pacific Islander, Non-Hispanic	6.2	5.7	7.0	7.6
Hispanic	14.7	13.4	7.0	7.1
Other, Non-Hispanic	7.2	6.6	7.0	7.6

Rates are number of infant deaths or fetal deaths per 1000 live births.
Race Specific Rates calculated from NCHS "Vital Statistics of the United States 1988 & 1989" Tables.

Table A1. WIC Eligibility Study

United States Territories[1] - Infant Mortality and Fetal Mortality Rates.

Census Extract Racial/ Ethnic Origin	1988 Infant Mortality Rate	1989 Infant Mortality Rate	1988 Fetal Loss Rate	1989 Fetal Loss Rate
Guam				
All Origins	7.7	7.6	6.8	6.8
Puerto Rico				
All Origins	12.5	12.3	10.0	10.0
U.S. Virgin Islands				
All Origins	13.1	12.9	17.1	17.1

[1] Data from *Vital Statistics of the United States, 1988.* - Mortality and Natality Data. Rates for 1989 calculated by applying the change in the overall U.S. rates 1988-1989 to the 1988 data.

Rates are number of infant deaths or fetal deaths per 1000 live births.

Sources of Data

National Center for Health Statistics, *Vital Statistics of the United States, 1988.* Vol I - Natality, Tables 1-69 & 3-2, Public Health Service, Washington DC. U.S. Government Printing Office, 1991.

National Center for Health Statistics, *Vital Statistics of the United States, 1988.* Vol II - Mortality, Tables 9-9 & 9-10, Public Health Service, Washington DC. U.S. Government Printing Office, 1991.

National Center for Health Statistics, *Vital Statistics of the United States, 1989.* Vol I - Natality, Tables 1-41 & 1-51 Public Health Service, Washington DC. U.S. Government Printing Office, 1993.

National Center for Health Statistics, *Vital Statistics of the United States, 1989.* Vol II - Mortality, Public Health Service, Washington DC. U.S. Government Printing Office, 1993.

Table 2-4. Infant, Neonatal, and Postneonatal Deaths and Mortality Rates by Specified Race or National Origin and Sex: United States, 1989. (p.4).

Table 2-8. Infant Mortality Rates by Race: United States, Each Division and State. 1987-1989 (p.10).

Table 2-19. Infant Deaths by Specified Hispanic Origin and Race for Non-Hispanic Origin: 47 Reporting States and the District of Columbia, 1989 (p.91).

Table 3-1. Fetal Deaths by Period of Gestation and State of Occurrence: United States and Each State, 1989 (Page 1).

Table 3-7. Fetal-death Ratios by Race: Each Division and State, 1984-1989 (Page 8).

National Center for Health Statistics, 'Advance report of final mortality statistics, 1990.' *Monthly Vital Statistics Report*, Vol. 41, No. 7, (Supplement). Hyattsville:MD: Public Health Service. January 7, 1993.

Table 25. Total deaths and death rates, and infant and neonatal deaths and mortality rates for the United States, each Division, and State; and by race and sex for the United States (Page 43).

National Center for Health Statistics, *Vital Statistics of the United States, 1989*. Vol I - Natality, Public Health Service, Washington DC. U.S. Government Printing Office, 1993.

Table 1-51. Live Births by Hispanic Origin and Race of Mother: 47 Reporting States and the District of Columbia. 1989 (p.95).

Appendix B

Estimation of the WIC Categorical and Income-Eligible Population

Appendix B. Estimation of the WIC Categorical and Income-Eligible Population

This appendix describes in detail the methods used to estimate the number of persons at or below 185 percent of poverty in the categorical groups served by the WIC Program. These estimates represented the number of persons in the five categorical groups at or below 185 percent of poverty level who would have been eligible for the WIC program in an average month in 1989 if categorical and income criteria alone were used to determine eligibility.

Infants and Children

As noted in the text of this report, the estimates of infants under one year of age and children ages one to five years of age were based on direct counts from the Census data.[1] The Census Bureau modified the age data for approximately 2.2 percent of the infants and children under five years of age by checking the correspondence between reported birth years and ages with the quarterly distribution of births at the national level in each birth year obtained from National Center for Health Statistics data.[2] Modifications were performed separately for each birth year, by sex and by race. The procedure essentially took the reported birth year to be true and the reported month of birth to be false. Consequently, babies born in 1990 had their ages correctly imputed to be zero. As Table B1 indicates, the age modification for infants resulted in an increase of more than 728,000 infants. This was 22.6 percent more than the unmodified counts.

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[1] These estimates differ from other published Census data because they use an adjusted count of infants developed by the Census to correct for the misclassification of infants less than one year of age. The Census Bureau found some problems with the accuracy of the ages reported in the 1990 Census. These problems were particularly acute for infants. Respondents tended to report ages and family size as of the date they completed the questionnaires, rather than as of April 1, 1990. Ages of infants in years may have been rounded up to age 1 to avoid reporting an age of 0 years. The latter practice would underestimate the number of infants and overestimate the number of children 1 year of age.

[2] The major assumptions in the modification procedure were that the geographic distribution of births was the same as the national distribution, that there were no significant birthplace-sex-race differences in annual birth distributions by quarter, and that mortality did not vary by quarter of birth.

Table B1. Age Modification of 1990 Census Counts of Infants and Children

Age	Unmodified (1)	Modified (2)	Change (1)-(2)
0	3,217,312	3,945,974	(728,662)
1	3,949,107	3,768,154	180,953
2	3,815,040	3,701,195	113,845
3	3,683,177	3,640,012	43,165
4	3,689,807	3,702,312	(12,505)
Total	18,354,443	18,757,647	(403,204)

Source: Bureau of the Census, "Age, Sex, Race, and Hispanic Origin Information from the 1990 Census: A Comparison of Census Results with Results Where Age and Race Have Been Modified," 1990 CPH-L-74, August 1991.

On the Census Extract file, infant data reflected the modified counts because the Census Bureau advised that these were the best counts of infants. These counts were given for six racial categories and five income levels (75 percent of poverty, 100 percent of poverty, 130 percent of poverty, 185 percent of poverty, and all incomes). The numbers of children who were categorically eligible for WIC was enumerated from the Census data, as classified by race and income levels.[3]

Pregnant Women

The number of pregnant women was estimated from the Census counts of women with their own infants. These were women who were assumed to have given birth in the

[3] While the general problem of age misclassification for infants also applies to children, the Census Bureau notes that for most single years of age, inaccuracies in age reporting offset each other. As Table 3 shows, children ages 1 and 2 were most affected by the reclassification of age. The original Census count for age 1 was reduced by 4.5 percent and that for age 2 by 3 percent, while ages 3 and 4 were only marginally affected. The Census Bureau only released counts of infants to FCS because of the size of the misclassification problem in that category and the importance of a reliable estimate of infants for the WIC Program. The Census Bureau will not release the modified counts of older children because these data are not considered more reliable than the unmodified counts.

twelve months prior to the Census date. However, the Census undercounts all pregnancies because it omits pregnancies that resulted in live births but for which the infant died prior to April 1, 1990 or disappeared for other reasons such as adoption. It also omits pregnancies that terminated without a live birth. To make the count more accurate, the estimates of pregnant women were adjusted for infant mortality and fetal loss. The estimates were also adjusted for infants who were not living with their natural mothers at the time of the Census. This included infants who were no longer living with their natural mothers as a result of adoption or placement in foster care or with relatives. The estimation of the number of pregnant women used the following demographic relationship:

$$N(t) = C(t-1) \times (1 - IMR_{(t-1,t)} - FLR_{(t-1,t)})$$

where

t denotes a period of time,

$t - 1$ denotes the previous twelve-month period,

$C(t-1)$ denotes the number of conceptions at a given time $t-1$,

$N(t)$ denotes the number of women with infants less than one year of age at a given time t,

$IMR_{(t-1,t)}$ denotes the proportion of infant deaths as a fraction of live births and fetal deaths during the period $t-1$ to t, and

$FLR_{(t-1,t)}$ denotes the proportion of fetal deaths as a proportion of live births and fetal deaths in the period (t-1,t).[4]

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[4]The adjustment for fetal deaths is not a complete adjustment for "pregnancy wastage" because fetal death rates $FLR_{(t-1,t)}$ as given in the NCHS Vital Statistics reports includes only the rate of termination of pregnancy resulting in fetal deaths for pregnancies at 20 weeks gestation or later. This estimate of pregnancies omits, therefore, any adjustment for spontaneous or induced abortions occurring prior to 20 weeks gestation.

The estimate of *conceptions in a year* is given by the equation:

$$C(t-1) = \frac{N(t)}{(1-IMR_{(t-1,t)}-FLR_{(t-1,t)})} .$$

The number $1 / [1 - IMR_{(t-1,t)}-FLR_{(t-1,t)}]$ is the adjustment factor to account for infant deaths and fetal deaths. It was used in estimating pregnancies from the number of live births in a given year.

To estimate the *number of women who were pregnant in an average month in 1989,* we adjusted the above number for the average proportion of the year that a woman was pregnant in 1989[5]. Because on average, a woman is pregnant for 9 months out of 12 months in a year, we would intuitively expect the factor to be 0.75. However, the use of the Census Extract required a somewhat more complex derivation to yield the desired degree of accuracy.

As seen in Table B2, women who were pregnant at any time in 1989 gave birth at any time between January 1989 and September 1990. For mothers who gave birth to children in the first quarter of 1989 (January through March 1989), the average duration of pregnancy was 6.5 weeks or 12.4 percent of the year. For the mothers of infants who were born between April 1989 and March 1990, the average number of weeks that the mother was pregnant in 1989 was 31.1 weeks or 59.7 percent of the year. For the mothers of infants born between April and September of 1990 (after the Census was taken), the average duration of pregnancy was 13.6 weeks or 26.1 percent of the year.

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[5]This adjustment was required in the present study, but was not required in the 1979 WIC Eligibility Study I. In the 1980 Census Extract women were tabulated if they had own children (0-9 months old), but in the 1990 Census age is only given in years, i.e., infants are recorded as age zero years.

Table B2. Derivation of the Percentage of a Year that a Woman Was Pregnant in 1989

Birth Month	Birth Year	Child's Age on 4/1/90 in months	Time Mother Was Pregnant in 1989 in weeks
January	1989	14	2.3
February	1989	13	6.4
March	1989	12	10.7
April	1989	11	15.0
May	1989	10	19.4
June	1989	9	23.7
July	1989	8	28.1
August	1989	7	32.6
September	1989	6	36.9
October	1989	5	39.6
November	1989	4	39.6
December	1989	3	39.6
January	1990	2	37.3
February	1990	1	33.1
March	1990	0	28.9
April	1990	Not born	24.6
May	1990	Not born	20.1
June	1990	Not born	15.9
July	1990	Not born	11.4
August	1990	Not born	7.0
September	1990	Not born	2.7

Summary

Birth Date	Child's Age	Average Weeks Pregnant	Percent of 1989
Jan 1989—Mar 1989	12-14 months	6.5	12.4%
Apr 1989—Mar 1990	0-11 months	31.1	59.7%
Apr 1990—Sep 1990	Not born on 4/01/90	13.6	26.1%

Note: Assumes birth date is midpoint of the month, and gestational period is 39.6 weeks.

The number of women who were pregnant in an average month in 1989 is given by:

$$\frac{Births_{4/89-3/90} \times .597}{(1-IMR_{1989,1990}-FLR_{1989,1990})} + \frac{Births_{1/89-3/89} \times .124}{(1-IMR_{1989}-FLR_{1988,1989})} + \frac{Births_{4/90-9/90} \times .261}{(1-IMR_{1990}-FLR_{1990})}$$

Using the data available from the Census Extract, this formula can be rewritten as:

$$\frac{(CCWOI_{0-11months}+Infants_{adoptions}) \times .597}{(1-IMR_{1989,1990}-FLR_{1989,1990})} + \frac{NOC_{12,13,14months} \times .124}{(1-IMR_{1989}-FLR_{1988,1989})} + \frac{NOC_{born4/90-9/90} \times .261}{(1-IMR_{1990}-FLR_{1990})}$$

where

$CCWOI_{(0\text{-}11\ months)}$ = Census Counts of Women with Own Infants who met the WIC income eligibility criterion for the current family size less 1[6],

$Infants_{(adoptions)}$ = Census Counts of Infants not living with their natural mothers (adopted, foster care, living with relatives) who met the WIC income criterion,

$NOC_{(12,13,14)}$ = Number of Children aged 12, 13, 14 months proxied as one-fourth of the number of children 1 year of age as given by the Census counts who met the WIC income criterion,

$NOC_{(born\ 4/90\ -9/90)}$ = Number of Children born between April 1990 and September 1990 proxied as one-half of the number of infants as given by the Census counts who met the WIC income criterion,

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[6]As discussed in a later section, the Census Bureau modified the ages of infants and increased the counts of infants by 728,662 infants. The counts of women with infants were given using the unmodified ages of the infants. To account for the discrepancy between the counts of infants using modified ages and the counts of women with infants using the unmodified ages, we adjusted the counts of women with infants by the ratio of the modified to the unmodified counts of infants.

IMR_{1989} = Infant Mortality Rate as given by the 1989 Cause of Death Summary Tape of the Vital Statistics Series data tapes (NCHS) expressed as a percentage of live births and fetal deaths[7],

$IMR_{(1989,1990)}$ = Infant Mortality Rate as given by the 1989 and 1990 Cause of Death Summary Tapes of the Vital Statistics Series data tapes (NCHS) weighted for the time period in each year (.75 IMR_{1989} + .25 IMR_{1990})

FLR_{1989} = Fetal Loss Rate as derived from NCHS vital statistics data for 1989 expressed as a percentage of live births and fetal deaths.[8]

$FLR_{(1988, 1989)}$ = Fetal Loss Rate as derived from NCHS vital statistics data for 1988 and 1989 appropriately weighted (.75 FLR_{1988} + .25 FLR_{1989})

$FLR_{(1989, 1990)}$ = Fetal Loss Rate as derived from NCHS vital statistics data for 1989 and 1990 appropriately weighted (.75 FLR_{1989} + .25 FLR_{1990})

Estimation of Postpartum Women Income Eligible for the WIC Program

The estimation of postpartum women (non-breastfeeding and breastfeeding women) eligible for WIC benefits had to adjust Census counts for these three different birth outcomes:

(1) postpartum women who gave birth to an infant that is living;
(2) postpartum women who gave birth to an infant that died in infancy; and
(3) postpartum women whose pregnancy terminated in a fetal death.[9]

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[7]These data were available at the state level by age and race of the mother and infant and were weighted by the proportion of each year to which they apply.

[8]These data were available by maternal age and race at the state level.

[9]The basis for the estimation of postpartum women was extracted from the 1990 Census of Population and Housing. The extract file included the following counts for several income levels for each county and state in the U.S.: (1) counts of women with their infant living in the household; and (2) counts of infants that do not live with their mothers. These include infants living with father or other relative, living with nonrelatives, infants in foster care and infants in group quarters. The infants who did not live with their mothers represented 8 percent of all infants in the U.S. in 1990, and 15 percent of infants living in families below 185 percent of poverty.

The classification of postpartum women into breastfeeeding women and non-breastfeeding women adjusted the counts of all postpartum women by the proportions of women who were likely to be breastfeeding their infants for a given length of time.

Specifically,

$$\underset{Postpartum\ Women}{All} = PP_{infant\ is\ living} + PP_{infant\ died} + PP_{fetus\ died}$$

where PP is used to denote postpartum women.

Some postpartum women do not live with their infants, so in order to account for postpartum women who gave birth to infants who are not living with them, the number of women with a living infant can be written as:

$$PP_{infant\ is\ living} = PP_{infants\ lives\ with\ mother} + PP_{infant\ doesn't\ live\ with\ mother}$$

The count of postpartum women with an infant aged 0 - 11 months living in the household was given directly in the Census Extract file. The count of postpartum women who do not have infants living with them was approximated by the number of infants who were not living with their mothers adjusted for infant mortality and multiple births.

Specifically, the *number of postpartum women with a living infant* was estimated as follows:

$$PP_{infant\ is\ living} = CCWOI_{current\ FS} + [\ INWM \times (1 - \frac{MBR}{2000})]$$

The *number of women who gave birth to a live infant that died in infancy* was estimated by:

$$PP_{infant\ died} = Infants \times (l_0 / 1^{L_0}) \times (IMR/1000) \times (1 - MBR/2000)$$

The *number of women who had a pregnancy terminate in a fetal death* was estimated by :

$$PP_{fetus\ died} = Infants \times (l_0 / 1^{L_0}) \times (FLR/1000)$$

where $CCWOI_{current\ FS}$ = the Census Counts of Women with Own Infants aged 0 - 11 months with poverty level given using the family size (FS) after birth;

INWM = the Census Counts of Infants aged 0 - 11 months who do not live with their mother and for whom the income level is imputed.[10];

Infants = the Census Counts of Infants aged 0-11 months at various income levels given directly by the Census;

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[10] Since the postpartum women may have a different income than the income level of the infant not living with their mothers, we approximated the income of infants not living with their mothers by modifying the income distribution of these infants to resemble the income distribution of the mothers with infants for each race in each county and state.

$l_0 / 1^{L0}$ = factor used to adjust counts of living infants to live births corresponding to the IMR for each state and race (specifically when $l_0 = 1$, ${}_1L_0$ can be calculated as $q_0 = 1\text{-}\exp\{-(IMR/1000)\}$ and $1^{L0} = q_0 / \{IMR/1000\}$);

IMR / 1000 = proportion of live births who died in infancy as given by vital statistics for each state and racial/ethnic group;

MBR / 2000 = proportion of births resulting in a multiple birth adjusted to avoid double counting the mother of twins. The multiple birth rate is given by vital statistics for each state and racial/group; and

FLR / 1000 = proportion of fetal deaths expressed as a proportion of live births as given by vital statistics for each state and racial/ethnic group.

The eligibility status of the postpartum mother can also change over time, depending upon the duration of breastfeeding. A woman who never breastfed her infant would be categorically eligible as a non-breastfeeding postpartum woman. A women who breastfed her infant for two months would be categorically eligible as a breastfeeding woman for two months and as a non-breastfeeding woman for four additional months. A mother who breastfed her infant for six months or more would be categorically eligible as a breastfeeding woman until the month that she stopped breastfeeding or the infant's first birthday.

The number of low income women who were breastfeeding or not breastfeeding in the 12-month, postpartum period was estimated by adjusting the number of postpartum women to reflect breastfeeding patterns in the United States. Estimates of the probability that a woman would breastfeed her infant for a given period of time were derived using life table methods. These proportions were used to estimate the two postpartum

categorical groups: (1) the breastfeeding women up to 12 months postpartum, and (2) the non-breastfeeding women up to six months postpartum.[11] That is,

$$\textit{Non-Breastfeeding Postpartum Women} = NBF_{\textit{infant is living}} + NBF_{\textit{infant died}} + NBF_{\textit{fetus died}}$$

or rewritten as:

$$\textit{Non-Breastfeeding Postpartum Women} = (1-p_{bf}) \times PP_{\textit{infant is living}} + (1-p_{bf}) \times PP_{\textit{infant died}} + PP_{\textit{fetus died}}$$

and

$$\textit{Breastfeeding Postpartum Women} = BF_{\textit{infant is living}} + BF_{\textit{infant died}}$$

or rewritten as:

$$\textit{Breastfeeding Postpartum Women} = p_{bf} \times PP_{\textit{infantisliving}} + p_{bf} \times PP_{\textit{infantdied}}$$

where

p_{bf} = the proportion of mothers who breastfeed their infants.[12]

Table B3 illustrates the change in categorical status that a postpartum women might undergo in the year after the birth of her infant. The movement from one categorical group to another must be accounted for in order to estimate the number of

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[11] A detailed explanation of how this analysis was carried out can be found in Appendix C of this report.

[12] This proportion is estimated for each month from birth to the first birthday.

breastfeeding women and non-breastfeeding women. The following proportions were estimated for each distinct age/income group:

$p_{bf(0)}$ = probability that a mother ever breastfed her infant,

$p_{bf(1)}$ = probability that a mother was still breastfeeding at first month of life,

$p_{bf(2)}$ = probability that a mother was still breastfeeding at the second month,

$p_{bf(3)}$ = probability that a mother was still breastfeeding at the third month,...,

$p_{bf(11)}$ = probability that a mother breastfed for the first year of life, i.e. stopped breastfeeding after the child's first birthday.

Appendix C presents the estimation of these proportions.

The proportions of women who were breastfeeding for a given number of months were used to classify the postpartum women into the breastfeeding and non-breastfeeding categorical

groups. Specifically, the estimate of *the number of postpartum breastfeeding women who were income eligible for WIC benefits* is given by:

$$\textit{Breastfeeding Postpartum Women} = \sum_{i=0}^{11}\left[\frac{PP_{\textit{infant living}}}{12} \times p_{bf(i)}\right] + \left[PP_{\textit{neodeath}} \times p_{bf(0)}\right] + \sum_{j=1}^{11}\left[\frac{PP_{\textit{Infants died}}}{11}\right] \times p_{bf(i)}.$$

where $PP_{\textit{infant living}}/12$ measures the number of women with infants living aged 0 months, 1 month, ..., aged 11 months[13] and is given its derivation is given above;

$PP_{\textit{neo death}}$ measures the number of women with infants who died before the age of 1 month[14] ; and

$PP_{\textit{infant died}}/11$ measures the number of women with infants who died at aged 1 month, ..., aged 11 months and its derivation is given above; and

---

[13]This assumes that births of children are uniformly distributed in each of the 12 months.

[14]Calculated as $PP_{\textit{infant died}}$ times the proportion of deaths that are neonatal deaths for a given racial group.

Table B3: Number of Months of Eligibility for Postpartum and Breastfeeding Women*		
Status of Women with infants 0 - 11 months	**Postpartum Non-Breastfeeding**	**Postpartum Breastfeeding**
Women Never Breastfed	6 months (NBF_6)	Not Applicable
Women Breastfed:		
1 month	5 months (NBF_5)	1 month (BF_1)
2 months	4 months (NBF_4)	2 months (BF_2)
3 months	3 months (NBF_3)	3 months (BF_3)
4 months	2 months (NBF_2)	4 months (BF_4)
5 months	1 month (NBF_1)	5 months (BF_5)
6 months		6 months (BF_6)
7 months		7 months (BF_7)
8 months		8 months (BF_8)
9 months		9 months (BF_9)
10 months		10 months (BF_{10})
11 months		11 months (BF_{11})
12 months		12 months (BF_{12})
	Total Number of Non-Breastfeeding Postpartum Women	Total Number of Breastfeeding Women

*Assumes the women changes categorical status from breastfeeding to postpartum non-breastfeeding within the first six months postpartum period.

$p_{bf(i)}$ = proportion of women in a given age/income group breastfeeding at the *ith* month given in Table C1 of Appendix C.[15]

The estimate of *the number of postpartum non-breastfeeding women who are income eligible for WIC benefits* is given by:

$$\textit{Non-Breastfeeding Postpartum Women} = \sum_{i=0}^{5} \left[\frac{PP_{\textit{infant living}}}{12} \times (1-p_{bf(i)})\right] + \left[PP_{\textit{neodeath}} \times (1-p_{bf(0)})\right] + \sum_{j=1}^{5} \left[\frac{PP_{\textit{lyfants died}}}{11} \times (1-p_{bf(i)})\right] + \left[PP_{\textit{fetus died}}\right]$$

where $PP_{\textit{infant living}}/12$ measures the number of women with infants living aged 0 months, 1 month, ..., aged 11 months and its derivation is given above;

$PP_{\textit{neo death}}$ measures the number of women with infants who died before the age of 1 month and is given above; and

$PP_{\textit{infant died}}/11$ measures the number of women with infants who died at aged 1 month, ..., aged 11 months and its derivation is given above;

$1- p_{bf(i)}$ = proportion of women in a given age/income group who are not breastfeeding their infants at the *ith* month; and

$PP_{\textit{fetus died}}$ measures the number of women whose pregnancies terminated due to a fetal death as derived above.

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[15]The estimation of the proportion of women breastfeeding their infants included the women who stopped breastfeeding their infants due to the infant's death. Although this occurred in few cases, the event was included in the estimation.

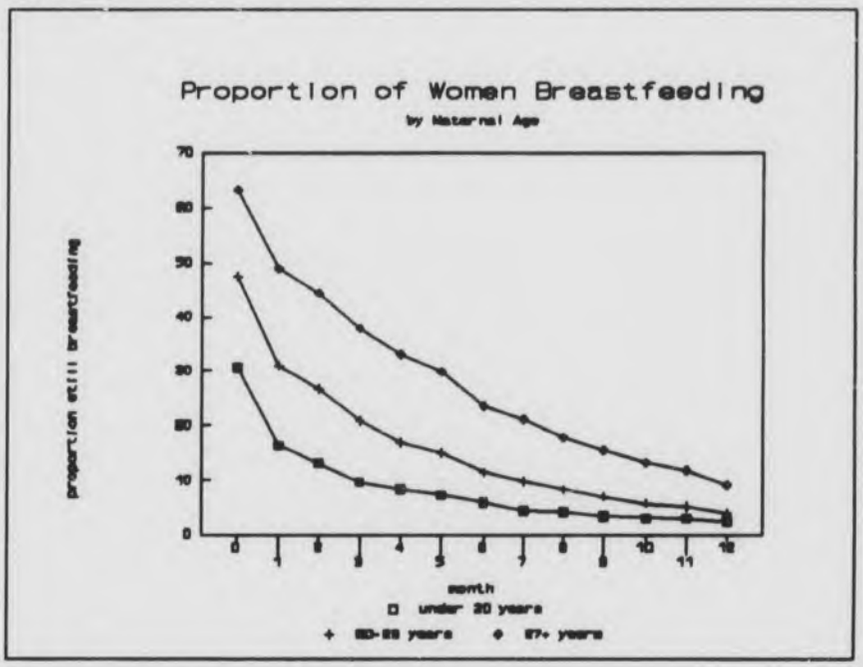
Appendix C

Breastfeeding Patterns in the United States in 1989

Appendix C. Breastfeeding Patterns in the United States in 1989

Breastfeeding patterns of postpartum women in the United States in 1989 were examined using survey data from the 1988 National Maternal and Infant Health Survey (NMIHS). The survey was a nationally representative, cross-sectional study of infant births and deaths conducted by the National Center for Health Statistics.

Figure C1



Analysis of the 1988 NMIHS data revealed that duration of breastfeeding in the United States varies by maternal age, income level, and race. Figure C1 shows that in the United States in 1988, mothers who were over 26 years of age were more likely to be breastfeeding their infants at birth than younger mothers (63 percent compared to 30 percent). As seen in Figure C2, mothers who were income eligible for WIC benefits (below 185 percent of poverty income guidelines) were less likely to breastfeed their infants at birth, and they also breastfed for a shorter time period. Forty percent of the income-eligible mothers initiated breastfeeding at birth compared to 62 percent of the mothers with household incomes above 185 percent of poverty.

Figure C3 shows the pattern of breastfeeding for three racial/ethnic groups: white non-Hispanic mothers, black non-Hispanic mothers and a third racial/ethnic group which was formed by combining Hispanics with Asian Pacific Islanders and Eskimo/Aleuts. White non-Hispanic mothers were more likely to breastfeed their infants at birth (59 percent) compared

to black mothers (23 percent). The mothers in the Hispanic/Asian/Eskimo group had breastfeeding patterns similar to those of white non-Hispanic mothers when their babies were first born; however they breastfed their infants for a shorter time period than white, non-Hispanic mothers.

Statistical analyses revealed that over two-thirds of the variance in duration of breastfeeding could be attributed to maternal age alone, and the remaining variance was explained predominantly by income. Racial/ethnic identity accounted for only 9 percent of the variance in breastfeeding duration.

The sample sizes of breastfeeding mothers in NMIHS were not large enough to estimate the proportion of women breastfeeding their infants for each age/income and racial/ethnic group.[1] Thus estimation of breastfeeding proportions was based on age and income for each month after birth for five distinct groups:

(1) mothers under 20 years of age who were at or below 185 percent poverty income;

(2) mothers aged 20-26 years who were at or below 185 percent poverty income;

(3) mothers over 27 years of age who were at or below 185 percent poverty income;

(4) mothers under 27 years of age who were above 185 percent poverty; and

(5) mothers over 27 years of age who were above 185 percent poverty income.

Figure C4 shows the proportion of mothers who were breastfeeding their infants up to the first year of birth for each of the above five groups. Table C1 presents these proportions in tabular form. These proportions for income-eligible women were used to estimate the number of breastfeeding women eligible for WIC benefits.

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[1]The life table techniques examined 216 cells (12 months times 3 age groups times 2 income groups times 3 racial/ethnic groups). Given that only half of the sampled mothers(5,000) were breastfeeding at birth and that the breastfeeding rates decline sharply in the first month, the estimation of the 216 values was not feasible.

Figure C2

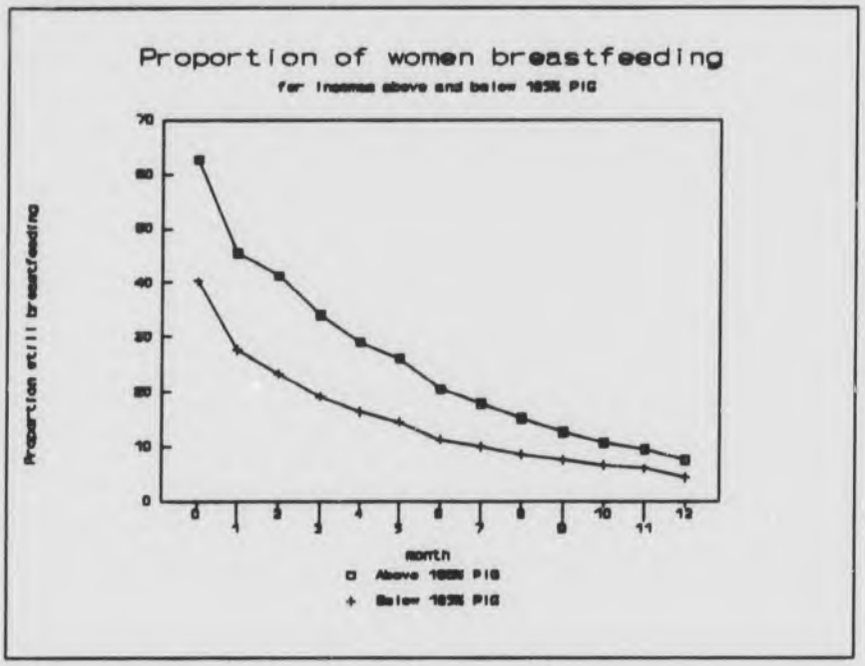


Figure C3

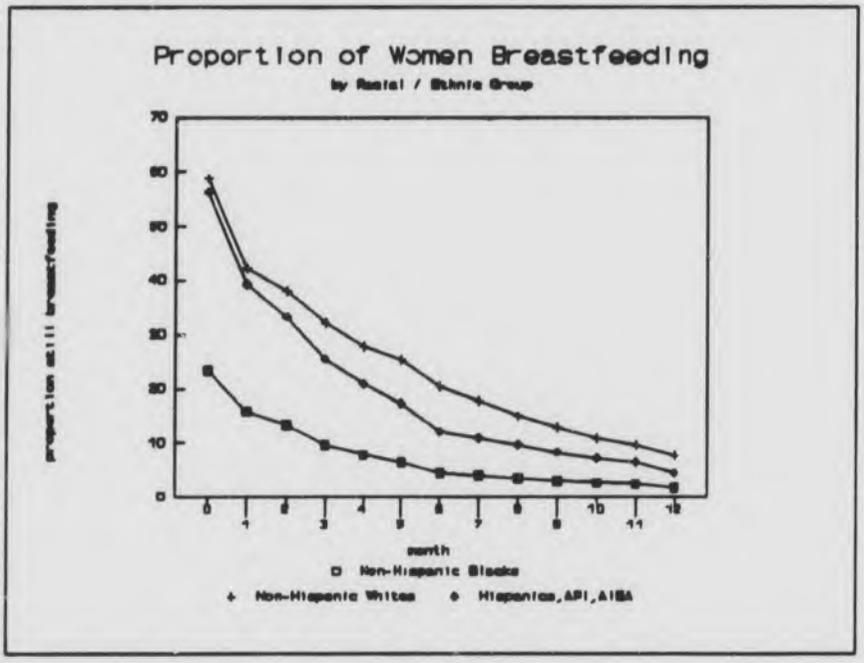


Figure C4

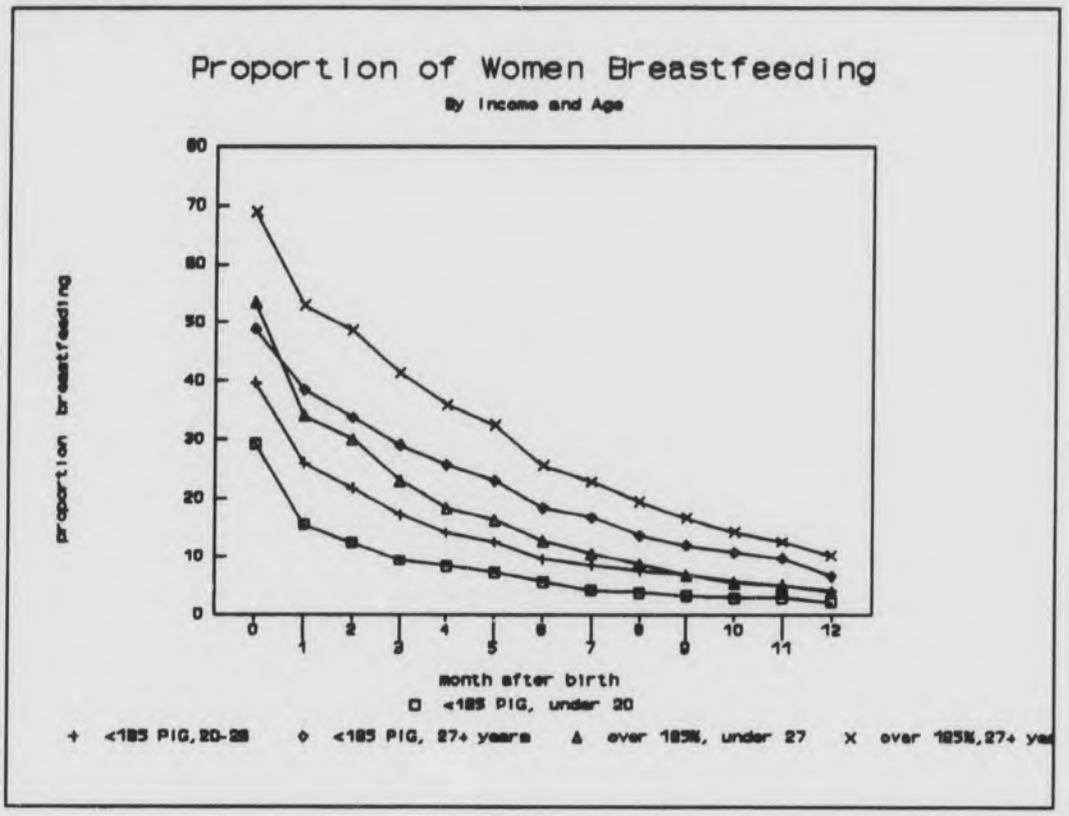

Proportion of Women Breastfeeding
By Income and Age
proportion breastfeeding
0
10
20
30
40
50
60
70
80
0
1
2
3
4
5
6
7
8
9
10
11
12
month after birth
□ <185 PIG, under 20
+ <185 PIG, 20-26
◇ <185 PIG, 27+ years
△ over 185%, under 27
× over 185%, 27+ ye

Table C1. Proportion of Women Breastfeeding (estimated from 1988 NMIHS data)

	<= 185% poverty income			>185% poverty income	
MONTH	under 20 years	20-26 years	27 years and over	under 27 years	27 years and over
at birth	0.29	0.40	0.49	0.53	0.69
1	0.16	0.26	0.38	0.34	0.53
2	0.12	0.22	0.34	0.30	0.49
3	0.09	0.17	0.29	0.23	0.41
4	0.08	0.14	0.26	0.18	0.36
5	0.07	0.12	0.23	0.16	0.32
6	0.06	0.09	0.18	0.13	0.26
7	0.04	0.08	0.17	0.10	0.23
8	0.04	0.07	0.14	0.09	0.19
9	0.03	0.07	0.12	0.07	0.17
10	0.03	0.06	0.11	0.05	0.14
11	0.03	0.05	0.10	0.05	0.13

Appendix D

Effect of Medicaid Adjunct Eligibility on Counts of WIC Income-Eligible Persons in 1989

Appendix D. Effect of Medicaid Adjunct Eligibility on Counts of WIC Income-Eligible Persons in 1989

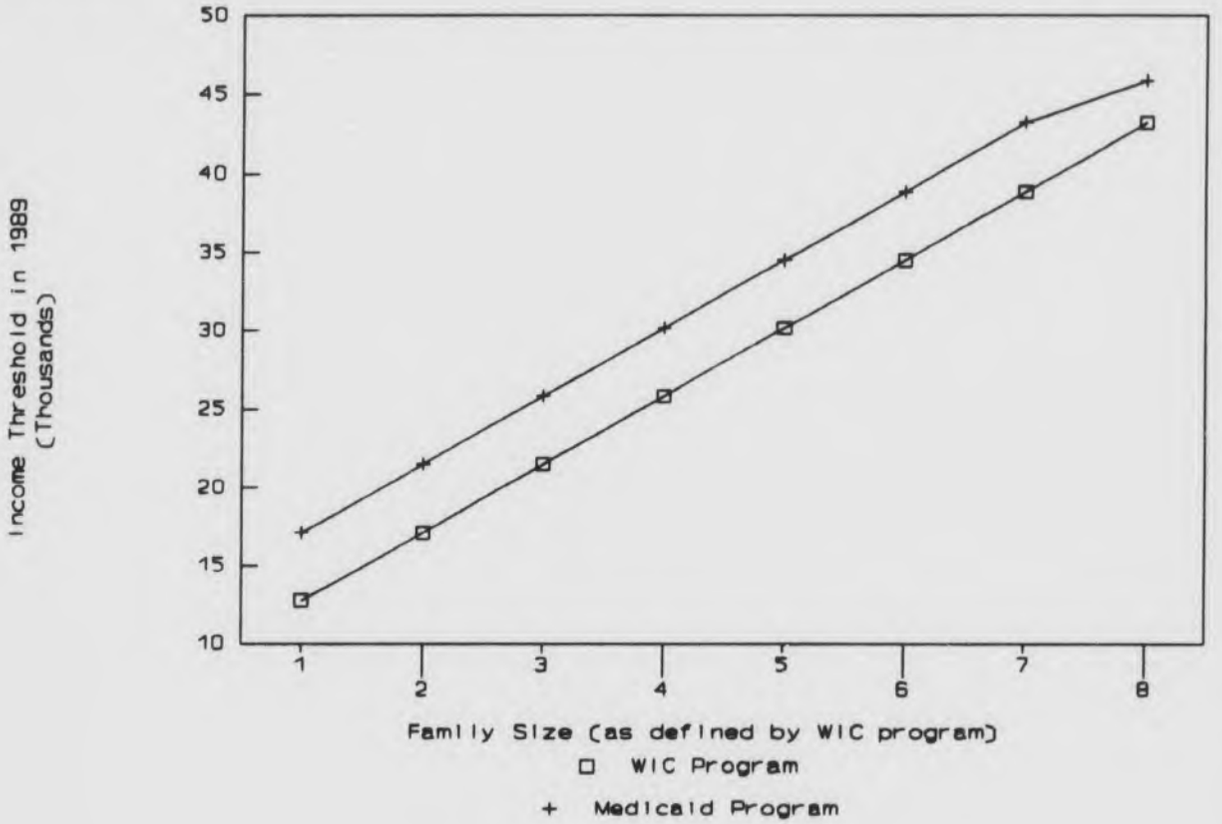
The Child Nutrition and WIC Reauthorization Act of 1989 required persons eligible for Food Stamps, Aid to Families with Dependent Children (AFDC), and Medicaid, as well as members of families in which a pregnant woman or infant receives Medicaid, be considered automatically income eligible for the WIC Program. This legislation (PL 101-147) was signed into law in November 1989 and states were required to implement these changes no later than July 1, 1990. Although adjunct eligibility procedures were not uniformly implemented until after May 1990 and were not in effect throughout most of 1989, the WIC Eligibility Study II offered an opportunity to study this issue. The Census Extract was used to estimate the potential size of this group of eligibles had the law been in effect in 1989. The issue of adjunct eligibility was also addressed because adjunct eligibility may increase the number of eligibles above the numbers obtained through direct computation from the Census Extract. This concern arose because the Medicaid program determines family incomes as a percent of poverty guidelines for pregnant women by counting each pregnant woman as two persons in determining family size for the income guideline comparison. This may cause some women, infants and children to be adjunctly eligible at family incomes higher than the WIC standard of 185 percent of the poverty, as computed by WIC. For example, in 1989 the income cutoff level for a family of three with a pregnant woman in the household to be eligible for WIC was $21,474 whereas the comparable Medicaid income threshold for the same family would be $25,829 (see Figure D1).[1]

Medicaid Eligibility

The Medicaid Program varies considerably across states. Each state has some discretion in determining the groups to cover and the financial criteria for Medicaid eligibility. Within broad federal guidelines, each state can: (1) establish its own eligibility standards, (2)

[1]Assumes state uses 185 percent of poverty for Medicaid threshold.

Figure D1. Comparison of Income Thresholds for the WIC and Medicaid Programs



determine the type, amount, duration, and scope of services; (3) set the rate of payment for services; (4) and administer its own program. The categorical groups covered by the Medicaid Program are currently:

(1) recipients of AFDC;
(2) recipients of SSI;
(3) pregnant women with household income below a given income limit;
(4) infants born to Medicaid-eligible pregnant women;
(5) children under six and pregnant women who meet the AFDC requirements or whose income falls below 133 percent of poverty level[2];
(6) recipients of adoption assistance and foster care; and
(7) some Medicare beneficiaries.

[2]This group became a mandatory group effective April 1, 1990.

Since 1989, considerable expansions have taken place in the Medicaid eligibility. In these years, states have expanded both their categorical and income-eligibility standards. For example, as of April 1, 1990, all states were required to cover children up to age six with family income below 133 percent of poverty. This change increased the number of categorically-eligible persons. Similarly while in 1989, 15 states provided coverage for pregnant women and infants at or below 185 percent of poverty, by 1992 the number of states using 185 percent of poverty as an income guideline had risen to 23.

Table D1 shows that 8.5 percent of the U.S. population participated in Medicaid in 1988 compared to 10.7 percent in 1991. Participation among the families below poverty level increased from 47 percent in 1988 to 53 percent in 1991. The Urban Institute estimated that in 1988, 12.7 percent of the total population in the United States were eligible for Medicaid benefits compared to 17.4 percent in 1992[3]. Some of this increase in the size of the eligible population was due to program changes in eligibility and some may have been attributable to falling incomes between 1988 and 1991. As seen in Table D2, the proportion of the persons below poverty who were eligible increased from 62 percent to 69 percent. In the groups of persons with family incomes between poverty and 200 percent of poverty, eligibility increased from 16 to 28 percent.

Although there was an increase in Medicaid eligibility, Winterbottom estimated that participation rates declined between 1988 and 1991 from 79.1 percent to 73 percent. Participation of persons below poverty remained stable at 83 percent and participation in the income groups between poverty and 200 percent of poverty declined from 69.5 percent in 1988 to 57.1 percent in 1991. This decline may be attributable to the fact that some targeted groups may not have been aware of the program changes since the late 1980s, and thus they were not participating in the Medicaid program.

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[3]Winterbottom, C., *Trends in Health Insurance Coverage: 1988-1991*, Urban Institute, 6169-06, July, 1993.

Table D1: Medicaid Coverage by Income Group in 1988 and 1991

		Income Groups (family income as a percent of poverty)		
	All Income Groups	Poor (<100%)	Near-Poor (100-199%)	Non-Poor (200%+)
1988 (Percent of Persons covered by Medicaid)	8.5%	47.7%	7.8%	0.7%
Total Persons ('000)	211,584	30,009	35,567	146,008
1991 (Percent of Persons covered by Medicaid)	10.7%	53.4%	11.0%	0.8%
Total Persons ('000)	217,882	33,726	38,592	145,564

Source: Urban Institute, 6169-06, C. Winterbottom, "Trends in Health Insurance Coverage 1988 - 1991", July 1993.

Data Source: March Current Projection Surveys, 1989 - 1992. Medicaid coverage corrected for underreporting by the Urban Institutes Transfer Income Model (TRIM).

Furthermore, some recipients of Medicaid benefits are classified as the *medically needy* population. Some of these persons may have had incomes above the income threshold for a given state, but their adjusted incomes after deducting medical expenses qualified them for Medicaid after certain spenddown adjustments were made to income. Winterbottom estimated from Current Population Survey data that in 1991, 5 percent of Medicaid recipients had income levels above 200 percent of poverty. The number of women, infants, and children who might have been adjunctly eligible for WIC as a result of the spenddowns could not be calculated without detailed analysis of expenditure and income data for households with persons in the WIC categories. This effect was not measured because the relevant data were

Table D2: Medicaid Eligibility and Enrollment in 1988 and 1991. Estimates from the Urban Institute's TRIM2 microsimulation model

		Family Income (as percent of poverty)		
	All Persons	< = 100 %	101-200%	over 200 %
1988				
Total Persons('000s)	211,583	30,009	35,567	146,008
Simulated Eligibility (1)				
Eligibles	26,834	18,601	5,713	2,521
Percent Eligible	12.7%	62.0%	16.1%	1.7%
Simulated Enrollment (1,2)				
Enrollees	21,222	15,614	3,969	1,638
Percent Enrolled	10.0%	52.0%	11.2%	1.1%
Participation Rate (3)				
Enrollees as percent of Eligibles	79.1%	83.9%	69.5%	65.0%
1991				
Total Persons('000s)	217,882	33,726	38,592	145,564
Simulated Eligibility (1)				
Eligibles	37,821	23,257	10,741	3,823
Percent Eligible	17.4%	69.0%	27.8%	2.6%
Simulated Enrollment (1,2)				
Enrollees	27,620	19,488	6,136	1,997
Percent Enrolled	12.7%	57.8%	15.9%	1.4%
Participation Rate (3)				
Enrollees as percent of Eligibles	73.0%	83.8%	57.1%	52.2%

Source: The Urban Institute's TRIM2 microsimulation model, based on the 1989 and 1992 March Current Population Surveys. (Table 3 in C. Winterbottom, *Trends in Health Insurance Coverage 1988 - 1991*, July 1993.)

Notes: Items may not sum to totals due to rounding.

1) TRIM2 simulates eligibility by comparing the characteristics of each person on the CPS with the Medicaid eligibility criteria in their state.

2) From the pool of simulated eligibles, TRIM2 selects enrollees on the basis of reported Medicaid status and the number of adult and child enrollees reported by each state.

3) The participation rate is an estimate of the percentage of persons eligible for benefits who actually enroll in Medicaid.

not available and the resulting numbers were likely to be less than one in a thousand and therefore not within the precision of the baseline numbers.[4]

Although adjunct eligibility procedures for the WIC program were not uniformly implemented until after May 1990 and were not in effect throughout most of 1989, the effect of adjunct eligibility on the WIC-eligible population was measured by estimating the potential size of the WIC eligible population had the adjunct eligibility law been in effect in 1989. Because program changes had also taken place in Medicaid, we used 1992 Medicaid eligibility rules for simulating the potential size of the adjunctly eligible population. That is, the size of the adjunct eligible population was estimated by applying the income thresholds in effect in 1992 and the categorical groups who were eligible in 1992. As noted in Chapter 5 of this report, this analysis answered two questions: (1) How many additional persons would have been eligible for WIC in 1989 because they were Medicaid recipients who would not have been otherwise eligible for WIC benefits? and (2) How many additional persons would have been adjunctly eligible in each categorical group? In addition, we computed an upper bound for the proportion of persons who would have been adjunctly eligible for the WIC Program by assuming that all states used 185 percent of poverty as their income threshold.[5]

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[4]Estimation of the medically needy person would require analysis of survey sample data that contains medical expenditures and participation data. The Survey of Income and Program Participation (SIPP) could be used, but the sampling error and measurement error caused by small samples could make the results unreliable.

[5]In 1992, 28 states used an income threshold of at or below 155 percent of poverty for eligibility for pregnant women. Persons at or below these levels would already be income-eligible for WIC benefits, and in these states no additional persons would be admitted with incomes higher than WIC income thresholds. Strictly speaking, the term *adjunct eligible* includes persons who participated in the Food Stamp Program, AFDC, or Medicaid. For this analysis, we measure the additional persons who would be admitted into WIC because their incomes were between the WIC income threshold and the Medicaid threshold.

Analytical Methods

As noted in Figure D1, the difference in the definition of family size used by the WIC program and Medicaid generated a group of pregnant women, infants, and children who lived in families who would have been income eligible for Medicaid, but whose incomes were above the WIC income thresholds. The postpartum women were not affected by this legislation for two reasons: the family size of a postpartum woman is defined similarly for the WIC and Medicaid programs and postpartum women are not in and of themselves a categorical group for Medicaid. The WIC categorical groups which are affected by adjunct eligibility legislation due to family size differences alone are pregnant women and infants and children who live in households with pregnant women.

One way to estimate the additional number of persons eligible as a result of differences in income thresholds between the two programs was to compare the Census tabulations for the persons using both the adjusted family size (FS-1) and full family size, as reported in the Census Extract. The number of the pregnant women adjunctly eligible for WIC benefits was estimated on an incremental basis by comparing the number of pregnant women eligible at 185 percent of poverty with family size given as the current family size in the Census and the number eligible with family size one less than the current family size. The former minus the latter adjusted for Medicaid participation yielded an estimate of the effect of adjunct eligibility through participation in Medicaid[6] Specifically:

$$\begin{matrix}\textit{Number}\\ \textit{Adjunct}\\ \textit{Eligibles}\\ \textit{PregnantWomen}\end{matrix} = (Pregnant_{FS,<185} - Pregnant_{FS-1,<185}) \times \left(\begin{matrix}\textit{Medicaid}\\ \textit{participation}\\ \textit{rate}\end{matrix}\right)$$

[6]Adjunct eligibility in the WIC program requires that a person be participating in the Medicaid program, not just eligible for Medicaid benefits.

where $Pregnant_{FS,<185}$ denotes the number of pregnant women below 185 percent of poverty measured using family size after pregnancy (Medicaid income threshold),

$Pregnant_{FS-1,<185}$ denotes the number of pregnant women below 185 percent of poverty measured using family size at pregnancy (WIC income threshold),

Medicaid participation rate.

For each of these pregnant women, there may be infants or children under age five also living in the home with the pregnant woman whose household incomes falls between the Medicaid cutoff and the WIC income cutoff. If the pregnant woman is a Medicaid recipient, the infants and children under age five in her home would be eligible for WIC benefits under adjunct eligibility legislation because they are members of families in which a pregnant woman receives Medicaid. The number of additional infants and children who would be eligible for WIC benefits because their family incomes fell between the WIC cutoff and the Medicaid cutoff was computed by adjusting the number of pregnant women whose incomes fell in the income threshold by the proportion of pregnant women who also had a child age one month to five years[7].

Specifically, the number of infants who would have been adjunctly eligible for WIC benefits was:

$$\textit{Number Adjunct Eligible Infants} = (\textit{Pregnant Women}_{FS,<185} - \textit{Pregnant Women}_{FS-1,<185}) \times (p_{\text{has infant}}) \times \left(\begin{array}{c}\textit{Medicaid}\\ \textit{participation}\\ \textit{rate}\end{array}\right)$$

[7]To calculate the number of infants and children who would have become adjunctly eligible for WIC because their mother was pregnant in 1989, we calculated the proportion of women with parity equal to or greater than 2 who had infants or children ages 1-4 years. This calculation was made using national vital statistics data for 1990 as provided by NCHS. Specifically using information about birth intervals for women with parity equal to or greater than 2, we calculated the proportion of second or greater births that would fall in the birth interval such that the existing child would have been under five years of age during some or all of the mother's pregnancy. These calculations allow for the possibility of more than one child in a household becoming adjunctly eligible as a result of his mother's pregnancy.

where *Pregnant Women* $_{FS, <185}$ denotes the number of pregnant women below 185 percent of poverty as measured using family size (Medicaid income threshold) ,

Pregnant Women $_{FS-1, <185}$ denotes the number of pregnant women below 185 percent of poverty as measured using family size of one less (WIC income threshold) ,

$p_{has\ infant}$ = proportion of pregnant women living in families with an infant (reflects measure of closely spaced births) (i.e.$p_{has\ infant}$ is the probability that an infant lives in a home with a pregnant woman [8])

Medicaid participation rate.

Members of families in which a pregnant woman or infant receives Medicaid are also eligible for WIC benefits under the adjunct eligibility legislation. Thus the number of children who would have been adjunctly eligible for WIC benefits is given as:

$$\textit{Number Adjunct Eligible Children} = (\textit{Pregnant Women}_{FS, <185} - \textit{Pregnant Women}_{FS-1, <185}) \times (p_{12-59}) \times \left(\textit{Medicaid participation rate}\right)$$

where *Pregnant Women* $_{FS, <185}$ denotes the number of pregnant women below 185 percent of poverty as measured using family size (Medicaid income threshold) ,

Pregnant Women $_{FS-1, <185}$ denotes the number of pregnant women below 185 percent of poverty as measured using family size of one less (WIC income threshold),

p_{12-59} = proportion of pregnant women living in families with a child between the age of 12 and 59 months[9].

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[8]This is computed from vital statistics which count the number of births which are spaced within 10-20 months of each other, given that a mother is pregnant for the second, third, etc. time. can be computed. Eleven percent of births in 1990 with parity equal to or greater than two were 10 to 20 months apart.

[9]The proportion of pregnant women that have a child age 12-59 months in the home at any time during her pregnancy is .62 which was derived from birth order and birth interval data from the vital statistics for 1990. See Table 19 of *Advance Report on Final Natality Statistics, 1990*, Monthly Vital Statistics Report February 25, 1993.

Results

Four scenarios are presented to measure the effect of adjunct eligibility. These scenarios are based on two different assumptions concerning the number of states that use 185 percent of poverty as their Medicaid income limit and two assumptions of the Medicaid participation rate:

- Scenario One: This scenario assumes Medicaid participation is as estimated by the Urban Institute's TRIM model in 1991 and that 23 states used 185 percent of poverty as their Medicaid income limit.[10]

- Scenario Two: This scenario assumes 100% participation in Medicaid and is based on the 23 states that used 185 percent of poverty as their Medicaid income limit in 1992.

- Scenario Three: This scenario assumes Medicaid participation is as estimated by the Urban Institute's TRIM model in 1991 and that all states used 185 percent of poverty as their Medicaid income limit.

- Scenario Four: This scenario assumes 100% participation in Medicaid and that all states used 185 percent of poverty as their Medicaid income limit in 1992. This scenario represents an upper bound for the incremental proportion of persons who would be adjunctly eligible for the WIC program.

Table D3 presents the results of estimating the additional pregnant women, infants and children who would have been eligible for WIC benefits in 1989 because their household's income was above the WIC income limit but below the Medicaid income limit, as a result of counting pregnant women as two persons in the Medicaid income determination. The results indicate that if adjunct eligibility rules had been in effect in 1989 and all states used 185 percent of poverty as their Medicaid income limit for pregnant women, the incremental number of WIC eligibles would have been 138,369 pregnant women and 15,566 infants and

[10]In 1992, 28 states used an income threshold at or below 155 percent of poverty for eligibility for pregnant women to be eligible for Medicaid. Persons at or below these levels would already be income-eligible for WIC benefits, and no additional persons would be admitted with incomes higher than WIC income thresholds.

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Table D3. **Effect of Medicaid Adjunct Eligibility on the Estimates of WIC Eligible Categories in the United States (1989)***
Estimates Derived by assuming Alternative State-Level Income Criteria for Medicaid Eligibility and Alternative Medicaid Participation Rates

	Income-Eligible Pregnant Women in 1989	Additional Income Eligible Persons by Category					
		Pregnant Women in Income Threshold		Infants	Children	Total Additional Eligibles	Percent Of WIC Income-Eligible Population in 1989
		(%)	Number	Number	Number		
Alternative Scenarios:							
Participation in Medicaid as in 1991* and 23 states used 185% of poverty(1992 eligibility)	971,976	5.4%	52,790	5,939	32,851	91,580	1.0%
Participation in Medicaid is 100% and 23 states used 185% of poverty(1992 eligibility)**	971,976	7.6%	73,895	8,313	45,985	128,193	1.4%
Participation in Medicaid as in 1991* and all states used 185% of poverty	971,976	10.0%	97,416	10,959	60,622	168,997	1.9%
Participation in Medicaid is 100% and all states used 185% of poverty**	971,976	14.2%	138,369	15,566	86,107	240,042	2.7%

* assumes following participation rates in 1991:
83.8% for women with incomes below poverty
57.1% for women with incomes between poverty and 185% of poverty level

** See Tables D4 and D5 for state level estimates .

86,107 children, if all pregnant women who were eligible for Medicaid participated in Medicaid (Scenario Four).

Two scenarios were based on the income cutoff limits used in 1992 by the Medicaid programs in each state. In these cases, 23 states would have had an increase in their WIC eligible pregnant women, infants, and children as a result of adjunct eligibility. In these states, 73,895 additional pregnant women, 8,313 infants, and 45,985 children would have received WIC benefits, if all persons who were eligible for Medicaid had participated in Medicaid(Scenario Two).

The above scenarios are each an outer bound because they use 100 percent participation in Medicaid. If persons eligible for Medicaid do not participate in Medicaid, they would not become adjunctly eligible for WIC. The effect of Medicaid adjunct eligibility is therefore mediated by the participation rate in Medicaid. The Urban Institute estimated in 1991 that 73 percent of Medicaid-eligible persons participated in Medicaid. Table D2 shows that this Medicaid participation rate was higher for persons with incomes below poverty, compared to persons with incomes between the poverty level and twice the poverty level.[11] The Medicaid participation rate for the population with incomes below poverty was estimated to be 83.8 percent. For women in households with income above poverty and below 200 percent of poverty, the participation rate in Medicaid was estimated to be 57.1 percent.

In this analysis, the incremental number of women with incomes below the poverty line were multiplied by 83.8% to adjust for Medicaid participation and the additional women with incomes between the poverty line and 185% of poverty were multiplied by 57.1% to adjust the estimates of adjunct eligible women for participation in Medicaid. Since the participation rate for pregnant women is likely to be higher than the entire Medicaid population, the choice of Medicaid participation rate for pregnant women and their infants and children is a matter

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[11]See Winterbottom, C., *Trends in Health Insurance Coverage: 1988-1991*, Urban Institute, 6169-06, July 1993.

of judgment because we do not know whether this group of pregnant women would be more or less likely to participate in Medicaid.

Tables D4 and D5 present state-level estimates of the additional numbers of pregnant women, infants and children who would have been eligible for WIC benefits in 1989 because their households' incomes fell above the WIC income limit and below the Medicaid income limit. Table D4 presents the incremental effect of Medicaid adjunct eligibility if every state had used 185 percent of poverty as their Medicaid cutoff. Table D5 presents the state-level effects for 1989 had the 1992 practices been in effect then. Specifically, the table presents the incremental number of adjunct eligibles for the 23 states that used 185 percent of poverty to determine Medicaid eligibility.

In the U.S.in 1989, had the adjunct eligibility legislation already been in effect, the additional pregnant women, infants, and children would have represented from 1 to 2.7 percent of the WIC income-eligible population, overall, depending on the state income cut-off values for Medicaid eligibility and the Medicaid participation rates. According to our estimates, the outer bound for the percentage increase in total WIC eligibles arising from all states using 185 percent of poverty as the Medicaid income criterion and from 100 percent participation in Medicaid would not have exceeded 2.7 percent of all income and categorically eligible persons.

Table D4. Effect of Adjunct Eligibility on the Estimates of WIC Eligible Categories
Estimates Derived by assuming each state uses 185 poverty for Medicaid Eligibility and an assumed 100% Medicaid Participation Rate*

	Income-Eligible Pregnant Women in 1989	Additional Income Eligible Persons by Category				
		Pregnant Women in Income Threshold		Infants	Children	Total Additional Eligibles
		(%)	Number	Number	Number	
United States	**971,976**	14.2%	**138,369**	**15,566**	**86,107**	**240,042**
State:						
Alabama	18,408	14.6%	2,689	303	1,674	4,666
Alaska	3,302	16.5%	544	61	338	943
Arizona	19,608	12.1%	2,376	267	1,479	4,123
Arkansas	11,952	13.1%	1,568	176	976	2,720
California	132,362	12.3%	16,254	1,825	10,115	28,198
Colorado	12,268	16.2%	1,987	224	1,237	3,448
Connecticut	6,646	14.8%	984	111	613	1,708
Delaware	1,812	16.0%	289	33	180	501
District of Columbia	3,091	8.6%	267	30	166	463
Florida	47,228	15.3%	7,245	815	4,508	12,568
Georgia	29,211	14.4%	4,209	474	2,619	7,302
Hawaii	4,311	19.9%	856	96	533	1,485
Idaho	5,009	17.3%	866	97	539	1,502
Illinois	40,297	12.6%	5,057	569	3,147	8,773
Indiana	18,457	19.0%	3,512	395	2,186	6,093
Iowa	8,986	19.0%	1,704	192	1,060	2,956
Kansas	8,976	18.2%	1,633	184	1,016	2,832
Kentucky	16,865	13.5%	2,280	257	1,419	3,956
Louisiana	25,554	10.0%	2,566	289	1,597	4,451
Maine	3,430	19.9%	682	77	424	1,182
Maryland	11,106	18.4%	2,044	230	1,272	3,545
Massachusetts	14,118	14.4%	2,030	228	1,263	3,522
Michigan	38,396	12.3%	4,738	533	2,948	8,220
Minnesota	12,641	17.9%	2,260	254	1,407	3,921
Mississippi	16,945	9.8%	1,661	187	1,033	2,881
Missouri	19,451	14.9%	2,888	325	1,797	5,011
Montana	3,518	16.7%	589	66	366	1,021
Nebraska	5,867	19.5%	1,145	129	713	1,987
Nevada	4,449	17.3%	771	87	480	1,338
New Hampshire	1,950	24.8%	483	54	300	837
New Jersey	16,253	16.1%	2,618	295	1,629	4,542
New Mexico	9,953	11.8%	1,169	132	728	2,029
New York	64,831	11.9%	7,728	869	4,809	13,406
North Carolina	25,797	17.2%	4,429	498	2,756	7,684
North Dakota	2,720	19.2%	522	59	325	906
Ohio	40,173	14.1%	5,652	636	3,517	9,806
Oklahoma	14,554	13.9%	2,023	228	1,259	3,510
Oregon	10,751	17.3%	1,855	209	1,154	3,217
Pennsylvania	34,664	16.9%	5,855	659	3,643	10,157
Rhode Island	2,701	15.5%	418	47	260	725
South Carolina	16,114	15.3%	2,469	278	1,536	4,283
South Dakota	3,464	13.6%	471	53	293	817
Tennessee	20,728	14.5%	2,997	337	1,865	5,200
Texas	91,738	12.5%	11,449	1,288	7,125	19,862
Utah	8,892	21.7%	1,931	217	1,202	3,350
Vermont	1,537	21.1%	325	37	202	563
Virginia	18,343	19.4%	3,564	401	2,218	6,183
Washington	16,745	17.7%	2,966	334	1,845	5,145
West Virginia	7,861	10.2%	799	90	498	1,387
Wisconsin	16,083	16.2%	2,612	294	1,625	4,531
Wyoming	1,860	18.3%	340	38	211	589
United States and Puerto Rico, Virgin Islands&Guam:	**1,010,560**	13.9%	**140,215**	**15,774**	**87,256**	**243,245**
Puerto Rico	36,976	4.5%	1,656	186	1,031	2,873
Virgin Islands	740	8.4%	62	7	39	108
Guam	868	14.7%	128	14	80	222

* Uses 100% Medicaid participation rate.

Table D5. Effect of Adjunct Eligibility on the Estimates of WIC Eligible Categories
Estimates Derived by using 1992 State-Level Income Criteria for Medicaid Eligibility and an assumed 100% Medicaid Participation Rate**

	Income-Eligible Pregnant Women in 1989	Additional Income Eligible Persons by Category				
		Pregnant Women in Income Threshold		Infants	Children	Total Additional Eligibles
		(%)*	Number*	Number*	Number*	
United States	**971,976**	7.6%	**73,895**	**8,313**	**45,985**	**128,194**
State:						
Alabama	18,408	-	0	0	0	0
Alaska	3,302	-	0	0	0	0
Arizona	19,608	-	0	0	0	0
Arkansas	11,952	13.1%	1,568	176	976	2,720
California	132,362	12.3%	16,254	1,829	10,115	28,198
Colorado	12,268	-	0	0	0	0
Connecticut	6,646	14.8%	984	111	613	1,708
Delaware	1,812	-	0	0	0	0
District of Columbia	3,091	8.6%	267	30	166	463
Florida	47,228	-	0	0	0	0
Georgia	29,211	-	0	0	0	0
Hawaii	4,311	19.9%	856	96	533	1,485
Idaho	5,009	-	0	0	0	0
Illinois	40,297	-	0	0	0	0
Indiana	18,457	-	0	0	0	0
Iowa	8,986	19.0%	1,704	192	1,060	2,956
Kansas	8,976	-	0	0	0	0
Kentucky	16,865	13.5%	2,280	257	1,419	3,956
Louisiana	25,554	-	0	0	0	0
Maine	3,430	19.9%	682	77	424	1,182
Maryland	11,106	18.4%	2,044	230	1,272	3,545
Massachusetts	14,118	14.4%	2,030	228	1,263	3,522
Michigan	38,396	12.3%	4,738	533	2,948	8,220
Minnesota	12,641	17.9%	2,260	254	1,407	3,921
Mississippi	16,945	9.8%	1,661	187	1,033	2,881
Missouri	19,451	-	0	0	0	0
Montana	3,518	-	0	0	0	0
Nebraska	5,867	-	0	0	0	0
Nevada	4,449	-	0	0	0	0
New Hampshire	1,950	-	0	0	0	0
New Jersey	16,253	16.1%	2,618	295	1,629	4,542
New Mexico	9,953	11.8%	1,169	132	728	2,029
New York	64,831	11.9%	7,728	869	4,809	13,406
North Carolina	25,797	17.2%	4,429	498	2,756	7,684
North Dakota	2,720	-	0	0	0	0
Ohio	40,173	-	0	0	0	0
Oklahoma	14,554	-	0	0	0	0
Oregon	10,751	-	0	0	0	0
Pennsylvania	34,664	-	0	0	0	0
Rhode Island	2,701	15.5%	418	47	260	725
South Carolina	16,114	15.3%	2,469	278	1,536	4,283
South Dakota	3,464	-	0	0	0	0
Tennessee	20,728	14.5%	2,997	337	1,865	5,200
Texas	91,738	12.5%	11,449	1,288	7,125	19,862
Utah	8,892	-	0	0	0	0
Vermont	1,537	21.1%	325	37	202	563
Virginia	18,343	-	0	0	0	0
Washington	16,745	17.7%	2,966	334	1,845	5,145
West Virginia	7,861	-	0	0	0	0
Wisconsin	16,083	-	0	0	0	0
Wyoming	1,860	-	0	0	0	0
United States and Puerto Rico, Virgin Islands & Guam	**1,010,560**	7.3%	**73,895**	**8,313**	**45,985**	**128,194**
Puerto Rico	36,976	-	0	0	0	0
Virgin Islands	740	-	0	0	0	0
Guam	868	-	0	0	0	0

* States using a stricter(lower) income criterion for Medicaid eligibility than 185% poverty are not incrementally affected by Medicaid eligibility, therefore zeros are listed for these states and territories.

** Uses 100% Medicaid participation rate.

*U.S. GOVERNMENT PRINTING OFFICE: 1996-717-312/82575