

***Nutrition Assistance Program Report Series***  
The Office of Analysis, Nutrition and Evaluation

Special Nutrition Programs

Report No. WIC-02-ADOL

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***Adolescent WIC Participants Study***  
*Volume I: Final Report*

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United States  
Department of  
Agriculture

Food and  
Nutrition  
Service

April 2002

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United States Food and  
Department of Agriculture Nutrition  
Service

April 2002  
Special Nutrition Programs  
Report No. WIC-02-ADOL

# Adolescent WIC Participants Study Volume I: Final Report

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This study was conducted under Contract number 53-3198-5-025 with the Food and Nutrition Service.

This report is available on the Food and Nutrition Service website: <http://www.fns.usda.gov/oane>.

## **Suggested Citation:**

Williams, R.L., J. Hersey, J. Kavee et. al. "Adolescent WIC Participants Study: Volume I: Final Report," *Nutrition Assistance Program Report Series*, No. WIC-02-ADOL, Project Officers: Anita Singh, Boyd Kowal. U.S. Department of Agriculture, Food and Nutrition Service, Office of Analysis, Nutrition and Evaluation, Alexandria, VA 2002.

## FOREWORD

The Special Supplemental Nutrition Program for Women, Infants, and Children (WIC) provides assistance to nearly 7.3 million participants each month. Adolescent women make up a substantial portion of this population. Recognizing that adolescents may have different service needs, the Food and Nutrition Service (FNS) launched the Adolescent WIC Participants Study.

As the first national WIC study to focus on adolescent participants, it had two major purposes. First, the agency wanted to determine whether adolescent WIC participants have specific needs within the diet and health areas addressed by the WIC Program. Second, it wanted to learn whether these needs are met by the program. The study was designed to discover the extent to which WIC addresses needs identified as unique to pregnant adolescents and teenage mothers. FNS also expected the study to provide the agency with information, which it could use with state and local partners to improve and strengthen the Program for adolescent WIC participants.

The study called for a survey of a nationally representative sample of WIC clinics and their adolescent clients in the contiguous 48 states. This design was somewhat compromised at the outset when seven states declined to participate in the adolescent client portion of the study. FNS concluded that it was in the agency's interest to press on with the survey, recognizing the limitations that it would place on the results and their interpretation.

A more serious problem was the low response rate the study was able to achieve during the course of the data collection. Despite substantial efforts on the part of the contractor, Research Triangle Institute (RTI), and additional resources brought to bear on the problem, the study was only able to achieve a response rate by adolescent WIC participants of slightly more than 50 percent. Several factors hindered the attainment of a higher response rate. First, the respondents could only be interviewed at the clinics, at which they appeared sporadically. Time constraints at clinics, aggravated by transportation problems, posed a difficulty. Second, because the respondents were minors and often did not attend clinic with their parents, RTI had to conduct anonymous interviews so that parental permission was not required. This precluded attempting any follow-up interviews to improve the response rate. On the positive side, the response rate among WIC clinic directors exceeded 95 percent.

What are the implications of this for the study results and their interpretation? First, the results must be interpreted with extreme caution. The biases inherent in studies with low response rates must be recognized, and therefore the findings from interviews of adolescents should be considered merely suggestive.

This is not to say that the findings in the report are completely without merit. Some of the findings are in high agreement with other WIC research conducted by FNS, notably the WIC Program and Participant Characteristics reports. The Adolescent WIC Participant Study results appear to corroborate much of what is known about pregnant and parenting adolescents, their nutrition and health needs, and how the WIC Program may better assist them.

The definitive study on adolescents enrolled in the WIC Program has yet to be conducted. The lessons learned in this current effort will help in the design and conduct of future research on WIC adolescents, their needs, and how to serve them.

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# EXECUTIVE SUMMARY

## **Study Background and Objectives**

The Special Supplemental Nutrition Program for Women, Infants, and Children (WIC) is a critical component of our nation's commitment to the health of mothers and children. Administered by the Food and Nutrition Service (FNS) of the U.S. Department of Agriculture (USDA), the WIC Program provides a combination of direct nutritional supplementation, nutrition education and counseling, and increased access to health care and social services to participants. Each month, the WIC Program serves more than 7 million low-income pregnant, breastfeeding, and postpartum women, infants, and children up to the age of 5 years who are determined to be at nutritional risk.

Approximately 15% of women served by the WIC Program are adolescents. While adolescents may be at greater nutritional risk than their older counterparts, little else is known about them. In 1995, FNS awarded a contract to Research Triangle Institute and Health Systems Research to learn more about adolescent WIC Program participants, how the Program identified their needs, and perceptions of WIC services they received. The study aimed to learn how well the WIC Program addresses the specific needs of pregnant adolescents and adolescent mothers in order to assist the Program in its ongoing commitment to improve services.

## **Study Approach**

The Adolescent WIC Participants Study is the first national survey of pregnant teenagers and teenage mothers served by the WIC Program. Following a series of 24 focus groups with WIC adolescents and staff to clarify the study issues and design, the study team conducted a multi-stage survey of 297 WIC clinic directors and 2,649 WIC adolescents, 14 to 19 years of age, who visited WIC clinics during a 60-day study period in the first half of 1997.

The response rates in the surveys were 96% among WIC clinic directors and 54% among WIC adolescents. Survey weights incorporated a nonresponse adjustment at the clinic level and within race/ethnicity in order to reduce effects on nonresponse, and analysis found that the race/ethnicity of the study sample was similar to that for the total population of WIC women. Hence, although care needs to be exercised in the generalization of findings to nonrespondents, the study information should prove useful for program planning.

## **Profile of Adolescent WIC Participants**

WIC adolescents are a vulnerable population. Infants born to adolescents often have higher risks of low birthweight and adverse health outcomes. This survey found that 52% of WIC adolescents had no more than a 10<sup>th</sup> grade education and their knowledge of nutrition may sometimes be deficient. For instance, over 43% of pregnant adolescents either did not think or were unsure that weight gain during pregnancy was important. Similarly, when pregnant adolescents were asked if what they ate while pregnant would affect their baby's health, 18% of all WIC adolescents (and 47% of Hispanic adolescents who chose to complete the interview in Spanish) disagreed or were unsure.



## **Outreach and Enrollment in WIC**

Substantial numbers of WIC adolescents fail to enroll in the Program during their first trimester of pregnancy; 44% of WIC adolescents report that they did not enroll until after their first trimester. According to data from the *Study of Participant and Program Characteristics 1996 (PC96)*, the national figure for failure to enroll in the first trimester is 53%. Sixty percent of WIC clinic directors estimate that the majority of adolescents failed to enroll by their first trimester. More than 82% of WIC adolescents had never participated in WIC before, and thus may not have had experience with how to enroll in WIC. This makes outreach and efforts to encourage timely enrollment an important issue for adolescents.

For adolescents, the most common source of information about WIC comes from family members. WIC clinic directors identified barriers to timely enrollment as failure to recognize that one is pregnant, lack of awareness about WIC, reluctance to accept WIC assistance, and lack of transportation. Focus groups with adolescents rarely identified transportation as a barrier, but suggest that clinic hours and waiting times are barriers.

## **Nutrition Education**

Adolescents find WIC nutrition education useful. They report learning from and applying what they learn in nutrition education sessions. In general, some 60 to 70% of adolescents reported that they were very likely to use the information that they learned from WIC on each of the 11 nutrition topics; 77% of all WIC adolescents reported that their eating habits had improved since enrolling in WIC. WIC nutrition education was perceived to be particularly useful by Spanish-speaking Hispanics; 94% of Spanish-speaking Hispanic adolescents reported that their eating habits had improved since enrolling in WIC.

WIC adolescents were particularly interested in information about how to stretch their food dollar and how to teach healthy eating habits to their children. New mothers were interested in learning how to introduce solid foods to their infants. Adolescents preferred individual nutrition education and classes in which they could interact with others in their age group, though they reported that they learned just as much from classes with other age groups.

Nutrition education efforts need to recognize that a primary source of nutrition information remains an adolescent's family, since WIC adolescents most commonly (42%) depend on their mother (or stepmother) for nutrition education. The next major source of nutrition information is a health care provider, with 26% of adolescents reporting this source. The third major reported source is WIC clinic staff (9%), followed by the baby's father (6%).

## **The WIC Food Package**

WIC adolescents generally report that they or their children actually use the WIC food items they receive. Despite the fact that WIC is designed as a supplemental nutrition program, adolescents frequently desired to receive greater quantities of WIC foods, particularly juice, cereal, cheese, milk, and infant formula. Cultural background influenced food preferences, and Hispanic adolescents more frequently reported that they would like to receive more beans and eggs.

## **Referrals for Health Care and Other Services**

Timely referral to health care and other services is one of the WIC Program's important contributions. The proportion of adolescents who reported receiving referrals to other programs was 41% for the Food Stamps Program and 55% for childhood immunization. This was considerably lower than reports by WIC clinic directors of their staff "commonly" making such referrals. WIC clinics routinely provide informational materials about other services; WIC adolescents, however, prefer active referrals in which the WIC clinic calls or makes an appointment for them.

## **Conclusion**

Adolescents appear to need special attention by the WIC Program. Adolescents are a developmentally vulnerable population who can greatly benefit from the services that WIC provides. WIC adolescents report using WIC foods and applying what they learn in nutrition education. However, substantial numbers of WIC adolescents fail to enroll in the WIC Program during their first trimester of pregnancy, so continued outreach to this population is important. Because a primary source of information about the WIC Program and about nutrition comes from the adolescents' family, it will be useful to employ outreach and education efforts that reach this audience. These efforts should be sensitive to the cultural diversity of the adolescents.

WIC adolescents prefer active referrals in which the WIC clinic staff call or help them to make appointments. Given lower-than-desired rates of follow-through on the part of adolescents, it will be useful to incorporate ongoing feedback and reminder systems to improve the integration of WIC services.

# 1. STUDY BACKGROUND AND OBJECTIVES

*The Adolescent WIC Participants Study is the first national survey to describe the characteristics and needs of pregnant women and mothers, aged 14 to 19, served by the WIC Program. Adolescents make up about 15% of the women participating in the WIC Program. This study sought to understand the needs of these women and their perceptions of the WIC services they received.*

## 1.1 Study Background

### The WIC Program

The Special Supplemental Nutrition Program for Women, Infants, and Children (WIC) is a major component of our nation's commitment to the health of mothers and children. Administered by the Food and Nutrition Service (FNS) of the U.S. Department of Agriculture (USDA), the WIC Program provides a combination of direct nutritional supplementation, nutrition education and counseling, and increased access to health care and social services to participants. The program serves low-income pregnant, breastfeeding, and postpartum women, infants, and children up to the age of 5 years who are determined to be at nutritional risk. These services are designed to counteract the adverse effects of poverty on their nutrition and health status. By intervening during the prenatal period, the WIC Program seeks to improve fetal development and reduce the incidence of low birthweight, short gestation, anemia, and other nutritionally related medical conditions.

Originally implemented as a Congressionally mandated pilot project in 1972, the WIC Program became a fully authorized Federal program in 1974. At that time, WIC provided benefits to approximately 88,000 participants monthly. With Congressional support, the WIC Program has expanded dramatically in subsequent years. Also, since 1987, WIC agencies have negotiated rebates with manufacturers of infant formula. These rebates are used by State and local WIC agencies to provide WIC services to large numbers of eligible individuals. Funding has increased from \$20 million in 1972 to about \$4 billion a year. Currently, the WIC Program serves more than 7 million participants.

Eligibility for receipt of WIC benefits is based on categorical eligibility, income eligibility, and nutritional risk. First, participants must satisfy State residency requirements and

be a member of one of the following categorical groups: (1) women during pregnancy, (2) women up to 1 year postpartum if breastfeeding or up to 6 months postpartum if not breastfeeding, (3) infants up to 1 year old, and (4) children aged 1 through 4 years. Second, a participant must meet State income eligibility requirements. To be eligible on the basis of income, an applicant's family income must fall at or below 185% of the U.S. Poverty Income Guidelines, although States may set lower income standards if they so choose. Applicants are also considered adjunctly income eligible if they receive food stamps, Medicaid, or Temporary Assistance to Needy Families (TANF) benefits.

Finally, participants must be individually determined to be at nutritional risk based on a medical and/or nutritional assessment by a health professional. These tests include, at a minimum, measurement of height and weight and (except for infants younger than 6 months) a hematological test of nutritional status. Nutritional risk is defined as one of the following:

- Detrimental nutritional conditions detectable by biochemical or anthropometric measurements
- Other documented nutritionally related medical conditions
- Dietary deficiencies that impair health
- Conditions that make an individual more likely to have inadequate nutritional patterns or nutritionally related medical problems.

The WIC Program is not an entitlement, however, and to date funding levels have been insufficient to serve all who are eligible. Therefore, in accordance with a federally regulated priority system, States give priority to serve those at highest risk. The priority system ensures that those determined to be at the greatest need are served first. Although WIC is a Federal program, benefits are administered by each State, the District of Columbia, 33 Indian Tribal Organizations (ITOs), and four of the U.S. Territories. Although States are not required to match federal funds, some States contribute additional funds for local programs.

## **Contributions to Health**

WIC has proven to be effective in improving the health of pregnant women, new mothers, and their infants. At least nine studies have found that WIC participation during pregnancy was associated with increased weight gain during pregnancy, decreased low birthweight, increased dietary quality, and decreased Medicaid costs (Edozian, Switzer, and Bryan, 1979; Kennedy and Gershoff, 1982; Kotelchuck et al., 1984; Metcuff et al., 1985; Stockbauer, 1986; Rush et al., 1990; Schneck et al., 1990; Contento et al., 1995). WIC participation often increases the frequency and duration of breastfeeding (Collins et al., 1984; Auberbach and Walburn, 1987; Rush et al., 1990; Saunders and Carroll, 1988; Armotrading, Probart, and Jackson, 1992). Three studies have found that WIC had a positive impact on growth and anemia prevention, as well as on the quality of diet, particularly with respect to iron and vitamins A and C for infants. These effects were strongest among WIC enrollees at highest risk (Smith et al., 1986; Rush et al., 1990; Batten, Hirschman, and Thomas, 1990). Finally, nutrition education has been found to positively affect the maternal diet of WIC participants (Rosander and Sims, 1981; Contento et al. 1995).

Building on these accomplishments, the WIC Program is committed to continuously improving the quality of services it provides and its ability to better meet the needs of program participants. It was in keeping with this commitment to continuous improvement that FNS conducted a study to assess the needs of a critically important population of its clients - adolescent WIC participants.

## **1.2 Study Purpose and Objectives**

Approximately 15% of women served by the WIC Program are adolescents. Adolescents are often at increased nutritional risk and may be socially vulnerable as well. Because WIC serves so many pregnant and postpartum adolescents, WIC is in a position to target needs specific to adolescents, help them overcome barriers to good health, and reduce nutritional risk.

Accordingly, in 1995, FNS awarded a contract to Research Triangle Institute (RTI) and Health Systems Research (HSR) to develop and conduct a needs assessment study for adolescent participants in the WIC Program. The study collected information about adolescent needs in such areas as: WIC outreach and enrollment; nutritional knowledge and attitudes; appraisals of nutrition education, dietary habits, and food intake; health behaviors; and, access to WIC services. The study assessed specific WIC services offered to adolescents and how adolescents perceived those services.

The study had two overall objectives:

- To determine the needs of pregnant adolescents and adolescent mothers enrolled in WIC.
- To determine the extent to which WIC serves the needs of pregnant adolescents and adolescent mothers.

## **1.3 Study Rationale**

Slightly more than 13% of all U.S. births are to teenagers. Even though teenage birth rates have fallen by 12% since 1991, the birth rate in 1996 was still 54.4 births per 1,000 women among those aged 15 to 19. Almost a million teenagers become pregnant each year and more than 500,000 give birth. Among girls ages 15 to 17, nearly 4 in 100 had a baby (Ventura et al., 1998).

## **The Potential Vulnerability of WIC Adolescents**

Adolescent WIC participants may be a particularly high-risk population. Compared to older women, pregnant adolescents receive less prenatal care and are at greater risk in terms of maternal and infant health.

**Less Prenatal Care.** Pregnant teenagers are least likely of all maternal age groups to get early and regular prenatal care. In 1995, 7.6% of mothers aged 15 to 19 received late or no prenatal care, compared to 4.2% for all ages (NCHS, 1997). Lack of prenatal care is strongly associated with an increase of low birthweight infants, preterm delivery, and maternal and infant mortality (Shapiro et al., 1980; CDC, 1994).

**Increased Risk to Mothers.** Teenage mothers are at greater risk of pregnancy complications such as premature labor, anemia, high blood pressure, and placental problems. These risks are even higher among young teenage mothers (Berenson, 1997).

**Increased Risk of Low Birthweight and Poor Infant Health.** In 1995, 9.3% of mothers aged 15 to 19 had a low birthweight baby (under 2,500 grams) compared to 7.3% for all mothers. The risk of low birthweight is highest for the youngest mothers; 13.5% of mothers under 15 years of age had a low birthweight baby in 1995 (NCHS, 1997). Low birthweight is one of the major risk factors for infant health. Low birthweight babies are more likely to have underdeveloped organs which can lead to lung problems such as respiratory distress syndrome. Low birth weight babies are 40 times more likely to die in their first month of life than normal weight babies (Institute of Medicine, 1985; MacDorman and Atkinson, 1998).

## **Adapting the WIC Program to Meet Adolescents' Needs**

The WIC Program is designed to address these problems through a program of nutritional supplementation, nutrition education, and referral of WIC parents, infants and children to needed health care and social services. This study is designed to learn how well these components of the WIC Program meet the needs of adolescent participants.

**The WIC Food Package.** The WIC food package is typically purchased by WIC participants at local grocery stores using vouchers or food checks to redeem specific items; in a few geographic areas, food is delivered to participants either directly (to participants' homes) or indirectly (to specified distribution points). The foods provided in the WIC food package are designed to provide specific nutrients known to be lacking in the diets of low-income individuals. They are intended to supplement the regular diet. The packages contain foods that are good sources of specific nutrients — protein, calcium, iron, and vitamins A and C. Food packages are specifically designed for different participants: packages for pregnant and breastfeeding women supplement their diets and meet their special nutrient requirements; infant food packages help meet the developmental needs of infants; and food packages for preschool children help to accommodate their nutritional needs. One aim of this study was to learn how well the WIC food package satisfied the eating habits and preferences of WIC adolescents and their children.

**Nutrition Education and Counseling.** Nutrition education plays a crucial role in the WIC Program by helping participants achieve positive changes in knowledge, attitudes, and behavior to improve their diet. Currently, at least one-sixth of Nutrition Services and Administrative (NSA) funds are devoted to nutrition education. Nutrition education teaches WIC participants how to use WIC foods and encourages positive changes in eating habits. It also promotes breastfeeding and, if needed, refers participants to alcohol, tobacco, and substance abuse counseling and treatment. This study sought to learn from adolescents how well nutrition education met their needs and how it might be improved in terms of content and method of presentation.

**Access to Health Care and Social Services.** The WIC Program helps WIC participants to obtain and use preventive health care services. While in some cases WIC agencies provide on-site health services, WIC does not generally fund health care services; in most cases, the Program refers participants to other agencies. Such referral encourages the utilization of existing health care. Because of its outreach to pregnant women, the WIC Program provides an important link between participants and appropriate health care providers or



systems. This study offered an opportunity to learn how the WIC Program can better facilitate access to health care and social services of adolescents, a group that may particularly benefit from such referrals.

## **1.4 Study Approach and Report Organization**

The study included both a qualitative and quantitative methodology. The qualitative component conducted 24 focus groups, 8 with agency and clinic staff and 16 with pregnant adolescents and adolescent mothers. The sessions provided data on the day-to-day context and point-of-view of WIC agencies and clients. This qualitative information was used to identify issues or questions that needed to be discussed in the needs assessment, and to develop the survey instruments used in the study.

The quantitative component of this study included a telephone survey of 297 WIC clinic directors in 44 States and a self-administered survey of 2,649 adolescent participants, 14 to 19 years of age. A multi-stage sampling design was developed consisting of WIC local agencies, clinics, and participants. The surveys were conducted in the first half of 1997. This report describes the major findings from this study.

Chapter 2 describes the methodology and survey design used for this study. Chapter 3 presents the major findings from the study. Chapter 4 discusses the major themes that emerged from our analysis of these data. Appendices to this report describe in greater detail the methodology of this study and contain detailed tables of study findings. A copy of the WIC clinic directors' questionnaire is included in **Appendix L**, and the adolescent participants' questionnaire is in **Appendix M**.

## 2. SAMPLING DESIGN

*This chapter describes the sampling design and approach used for this study. Following a series of 24 focus groups to clarify the issues to be included in the study, the study group conducted a multi-stage survey using a clustered sampling design of 297 WIC clinic directors and 2,649 WIC adolescents between the ages of 14 to 19 who visited WIC clinics during a 60-day study period in the first half of 1997.*

*The response rates in the surveys were 96.1% among WIC clinic directors and 53.8% among WIC adolescents. Survey weights included a nonresponse adjustment at the clinic level and within race/ethnicity in order to reduce effects on nonresponse. Also, analysis found that the race/ethnicity of the study sample was similar to that for the total population of WIC women. Hence, although some caution should be exercised in the generalization of findings to nonrespondents, study information should prove helpful in planning to meet the needs of WIC adolescents.*

### 2.1 Representation

The study design is a nationally representative sample of the 48 contiguous United States, including Indian WIC agencies. This sample excludes WIC clinics and participants in Alaska, Hawaii, Puerto Rico, Guam, and the Virgin Islands. In 1991, Puerto Rico accounted for 2.6% of all WIC participants, while Alaska, Hawaii, Guam, and the Virgin Islands together accounted for only 0.7%. WIC clinics outside of the 48 contiguous States were excluded from the study due to the high cost of including them in the sample and the low percentage of the WIC population served by such clinics.

### 2.2 Target Population

The target population for the Adolescent WIC Participants Study consisted of two components, adolescent WIC clients and directors from the WIC clinics they attend. A client between the ages of 14 and 19 was deemed eligible for the study if she was either

- 1) pregnant and fully enrolled in the WIC Program,
- 2) the mother of an infant less than one year old or child who was fully enrolled in the WIC Program, or
- 3) both.

WIC clinics were eligible for the study if they provide services to eligible WIC clients.

Estimates from the *clinic directors survey* are representative of the 48 contiguous United States, including Indian WIC agencies. However, representatives from seven states refused to participate in the *client* portion of the study. Therefore, estimates from the *WIC client survey* are representative of the contiguous United States, excluding the seven states.

Over a 60 day period, eligible adolescents were listed on an RTI-supplied sampling sheet as they entered a clinic to receive WIC services. Thus, the study group included only adolescents who received services in a WIC clinic during the study time period. In addition, to maintain the anonymity of the clients, the sampling sheets recorded only their first name or initials. A few adolescents who attended clinic more than once during the 60 day study period may have had more than one chance to be included in the study. Therefore, the client visit is technically the unit of analysis for the client data. However, this unit will loosely be referred to as “adolescents” in the discussion of the analysis results.

### **2.3 Non-English Speaking Participants**

Estimates from the 1996 WIC Program and Participant Characteristics Study (PC96) indicated that approximately 31.1% of WIC women were of Hispanic origin. Due to the large percentage of eligible adolescents who may only speak Spanish, study instruments were developed for English-speaking and Spanish-speaking clients. Since the survey was self-administered using audio-computer assisted self-administered interviewing (ACASI), a respondent could choose to listen to questions read in either English or Spanish. Also, ACASI allowed the survey to be administered to respondents with fairly low reading levels. Adolescents fluent in neither English nor Spanish were ineligible for the study.

## 2.4 Sample Selection

The Adolescent WIC Participants Study collected data from two sources: WIC clinic directors and adolescent WIC participants. A multi-stage design was used since a complete list of clinics and participants was not available during sampling. Eligible local agencies (LAs) were sampled from a list frame in the first stage.

Clinics were selected for the second sampling stage from lists provided by the participating LAs; clinic director data was obtained from the participating clinics. To collect the client data, a subset of the participating LAs from the first sampling stage was selected. Adolescent data was obtained from the stage-two clinics within the subset of LAs. Further details on the sampling design are provided in **Appendix A**.

## 2.5 Sample Characteristics and Response Rate

### 2.5.1 WIC Clinic Directors

**Table 2.1** provides the unweighted response rates for the clinics within the FNS regions. WIC clinics were designated as nonrespondents if the clinic director either refused to participate in the study or failed to provide a complete questionnaire. Of the 311 clinics selected for the Clinic Director Survey, completed interviews were obtained from 297 directors, or their designees. Interviews were not obtained from the remaining 14 directors for the following reasons:

- 1) Partial Interviews — One questionnaire, although completed, was unusable due to a technical problem that arose during the electronic transmission of the interview data from the Field Coordinator’s laptop computer to RTI’s central computer.
- 2) Unusable Interviews — Two questionnaires, although completed, were unusable because the study group learned (after the fact) that the responses provided in each questionnaire pertained to the entire jurisdiction of the local agencies rather than to the individual clinics.

**Table 2.1 WIC Clinic Response Rates By FNS Region: 1997 Adolescent WIC**

FNS Region	# Eligible Clinics *	# Complete CDQs	Response Rate
1	37	36	97.3 %
2	31	31	100.0 %
3	57	54	94.7 %
4	56	53	94.6 %
5	46	44	95.6 %
6	32	32	100.0 %
7	50	47	94.0%
	309	297	96.1%

\*Region 3 had two ineligible clinics; classified as ineligible after receiving Clinic Director Questionnaire data

- 1) Ineligible Clinics — Two clinics were classified as ineligible after the study group had received the completed questionnaires.
- 2) Final Refusals — Nine clinics were classified as nonrespondents to the Clinic Director Survey. All of these refusals occurred during the preliminary State or local agency contact period. No clinics declined to participate when they were contacted by a Field Coordinator.

Two “Clinic-Only” clinics in region 3 were selected from lists provided by a local agency staff members. However, these two clinics were actually LAs that were listed on the stage 1 sampling frame. Thus, they were designated as ineligible for the study. The responding clinic directors were weighted so as to represent all clinic directors in the 48 contiguous United States.

## **2.5.2 Adolescent WIC Participants**

### **Sample Characteristics**

The Adolescent WIC Participants Study collected data from a multistage clustered random sample of 2,649 WIC adolescents between the ages of 14 and 19. The characteristics of the sample in terms of pregnancy status, age, and race/ethnicity are shown in **Table 2.2**.

**Table 2.2 Sample Characteristics: Pregnancy Status, Age, and Race/Ethnicity**

<b>Pregnancy Status</b>	
Pregnant with no infant or child in the Program	932
Infant or child in Program; not pregnant	1,463
Pregnant and with an infant or child in the Program	254
<b>Age</b>	
14	76
15	187
16	421
17	608
18	721
19	636
<b>Race/Ethnicity</b>	
White	519
Black	898
Hispanic	1,124
(Completing Survey in English)	811
(Completing Survey in Spanish)	313
Other Race/Ethnicity	108
<b>Total Participants</b>	<b>2,649</b>

When given a choice of taking the survey in Spanish or English, 2,349 respondents took the survey in English, while 324 took it in Spanish. Interestingly, of those adolescents identifying themselves as Hispanic, 811 chose to take the survey in English, while 313 chose to take it in Spanish. Subsequent sections of this report note that the adolescents taking the survey in Spanish appeared to differ in their responses from other Hispanic adolescent respondents. Accordingly, when informative, the analysis distinguishes between Hispanics who completed the survey in English and Hispanics who completed the survey in Spanish.

### **Response Rates**

Unweighted response rates for the adolescent participants within the three race/ethnicity categories are provided in **Table 2.3**. Adolescents were designated as nonrespondents if they either refused to participate in the study or failed to provide a complete questionnaire. Certain questions were skipped depending on the adolescent's parenting status (pregnant, parenting, or both). The ACASI questionnaire was programmed in two sections, part A and part B. A complete questionnaire contained the appropriate information for all of part A and at least some information in the last section of part B, the demographic section. Adolescents were considered ineligible if they could not understand either the Spanish or English audio portions of the

questionnaire. Only adolescent clients themselves were considered eligible; proxies (those who came to the clinic to pick up WIC vouchers for the adolescent clients) were not permitted to answer the questionnaires for the clients.

**Table 2.3 Adolescent WIC Participant Response Rates By Race/Ethnicity: 1997 Adolescent WIC Participants Study**

Race/ Ethnicity	Total # Listed Adolescents	Total # Sampled Adolescents	# Eligible Responding Adolescents	# Ineligible Adolescents	Response Rate 1 <sup>1</sup>	Response Rate 2 <sup>2</sup>
Black	2,746	1,824	898	133	56.5%	53.1%
Hispanic	4,022	2,369	1,124	170	54.6%	51.1%
White/Other	1,803	1,487	627	106	49.3%	45.4%
<b>TOTAL:</b>	<b>8,571</b>	<b>5,680</b>	<b>2,649</b>	<b>409</b>	<b>53.8%</b>	<b>50.3%</b>

<sup>1</sup> (Eligibles + Ineligibles) / Total

<sup>2</sup> (Eligibles) / (Total - Ineligibles)

One limitation of the study is that only 53.8% of the adolescents selected for the study actually participated. Because the response rate was tracked each week during the data collection period, the trend toward a low response rate was noted early in data collection. In consultation with FNS, an “extra effort” campaign was implemented to try to improve the response rate and to understand the factors contributing to the low response rate. The following steps were taken:

- Clinics were classified according to severity of response problem:

Category A -- most serious problems: more than 20 WIC participants selected for participation and response less than 75%.

Category B -- potentially serious problems: 20 or less WIC participants selected and response less than 75%.

Category C -- currently achieving a 75% or better response rate.

This classification was dynamic, not static, and was based on the daily cumulative record of sampling sheets submitted by fax to RTI. Thus, the classification was updated each day.

- This classification variable was added to regular internal reports so that clinics could be grouped by category and re-evaluated each day.
- A special report was generated showing classification of clinics by category and by RTI Field Coordinator to facilitate individual action.
- “Brain-storming” sessions were held to discuss perceived problems and possible remedies.
- An introductory script was developed for clinic staff to use when introducing the study to selected participants.
- A memorandum, including script, was developed to send to all clinics. The memorandum explained the problem of low numbers being selected and lower than expected participation rates. It urged the clinics to increase their efforts to list all eligible participants and to persuade all selected adolescents to participate.
- A memorandum to RTI Field Coordinators was developed which explained what actions should be taken to improve participation rates, including contacting all of their assigned clinics -- the local clinics in person and the others by telephone.
- RTI Field Coordinators were authorized to travel to some Category A clinics—those with the most serious problems—which required overnight stays.
- Eleven selected clinics in North and South Carolina, Ohio, and Pennsylvania were visited to better understand the problems that clinics were having with the study.
- Some clinics were provided with an additional computer so that more than one adolescent at a time could complete the survey. These additional computers were shipped as soon as the need was established. Multiple computers had already been provided to many clinics before the extra effort campaign was implemented.

Despite all of the above efforts, the study group was not able to greatly improve the response rate. One factor contributing to this low response rate was the need to interview adolescents anonymously. Anonymous interviewing was required to gain approval from State and local institutional review boards for the protection of human subjects, and to comply with laws and regulations of the States concerning interviewing adolescents. In addition, non-anonymous interviews would have required parental consent and would have made the study prohibitively expensive. Anonymous interviewing, however, made it impossible to trace and conduct follow-up interviews with adolescents who could not participate during their clinic visits. This greatly limited the ability of the data collection effort to improve the response rate.



In addition, the study group found that the data collection plan depended too much on the local clinic staff. All of the clinics that the study group visited were extremely busy. The staff understood the need for the study and were extremely interested in getting their clients to participate. However, frequently, the clinic staff were not able to devote enough time to the study to induce the selected adolescents to participate. As should be expected, the top priority of clinic staff was serving their clients.

Further, adolescent WIC clients tended not to want to stay at the clinic longer than absolutely necessary. Many were driven to the clinic by a friend or relative who was waiting for them. Many adolescent clients came to the clinic expecting to pick up their vouchers and leave and were not prepared to stay an additional 30 minutes to complete the interview. Moreover, several of the clinic staff indicated that they had pledged quick processing to potential clients as part of their outreach effort; these staff were concerned that asking adolescents to stay longer to complete a survey might impact WIC participation.

Finally, several WIC directors indicated that they were doing well to get more than 50% of adolescents to agree to participate in a public health survey.

The study group sought to minimize the impact of response rate by using analysis weights which adjusted nonresponse both for effects of race/ethnicity and for the effects of clinic characteristics (thus, within each clinic). The nonresponse adjustment procedures the study group used are described in **Appendix D**.

While generalization of study findings to the entire population of WIC adolescents should be made with appropriate caution, it is reassuring to note that response rates were roughly comparable for different race/ethnicity groups (56.5% among blacks, 54.6% among Hispanics, and 49.3% among whites). Indeed, that response rates were slightly higher among blacks and Hispanics suggests that this study did a reasonably good job of characterizing the experience of

the WIC adolescents from limited resource populations, since black and Hispanic WIC women tend to have lower household incomes than whites.<sup>1</sup>

Finally, the study group found that the demographic characteristics of the sample in the Adolescent WIC Participants Study reflected the race/ethnicity characteristics of the total population of WIC women in 1996 (as shown in **Table 2.4**).

**Table 2.4 Race/Ethnicity of Respondents in the Adolescent WIC Participants Study and of All WIC Women in 1996**

Race/Ethnicity	Adolescent WIC Participants Study	All WIC Women	Difference
White (non-Hispanic)	41.9%	43.2%	- 1.3%
Hispanic	26.3%	31.3%	- 4.0%
Black (non-Hispanic)	23.9%	21.3%	2.6%
Other	7.9%	4.2%	3.7%

Note: In PC96, 0.6% of WIC women did not report race/ethnicity. In the table above, these “nonreported” cases were treated as missing data, and estimates were adjusted proportionately. PC96 includes adolescents.

Source: USDA, Study of WIC Participant and Program Characteristics 1996, Exhibit 3.3, 1998.

Other data sources compiling information on adolescent WIC participants were not readily available; thus, making judgements about the extent of any potential biases was difficult. For example, this study included the adolescent mothers of WIC infants. The age of the mother is not routinely collected in the records of WIC infants, which makes it hard to compile results comparable to this study. In addition, since the data were collected anonymously, the study group was not able to link to the WIC records of either the respondents or nonrespondents to help understand the impact of the low response rate on the interpretation of the data. Accordingly, the findings from this study need to be interpreted with appropriate recognition to the possible limitations associated with nonresponse.

<sup>1</sup> In 1996, the proportion of all WIC women living at less than 50 percent of the poverty level was 42.0% among blacks, 33.9% among Hispanics, and 26.8% among whites (USDA, 1998, Exhibit 4.9).

### 3. STUDY FINDINGS

*This chapter presents the major findings of the 1997 Adolescent WIC Participants Study. Again, 297 WIC clinic directors and 2,649 WIC adolescents between the ages of 14 and 19 were surveyed. This study provided the first national data on five key issues:*

- ***A Profile of WIC Adolescents.*** *WIC adolescents appear to be a vulnerable population - more than half have no more than a tenth grade education, about 75% are not employed, and all are coping with the challenges of poverty, pregnancy and motherhood. In addition, 82% of WIC adolescents have never been involved with WIC before - making outreach an important issue.*
- ***Enrollment in WIC.*** *Substantial numbers of WIC adolescents fail to enroll in WIC during their first trimester. The most common source of information about WIC comes from family members, suggesting the importance of outreach efforts to families. Efforts to encourage timely enrollment will need to address such barriers as failure to recognize that one is pregnant, lack of awareness about WIC, reluctance to accept WIC assistance, and transportation.*
- ***Nutrition Education.*** *WIC adolescents report applying what they learn in nutrition education. They were particularly interested in information about how to stretch one's food dollar. Spanish-speaking Hispanic adolescents are especially interested in nutrition education. Still, many adolescents are reluctant to attend additional nutrition education classes.*
- ***WIC Foods.*** *WIC adolescents generally report that they or their children actually use the WIC food items they receive. Despite the fact that WIC is designed as a supplemental nutrition program, adolescents frequently indicated a desire to receive greater quantities of WIC foods, particularly juice, cereal, cheese, milk and infant formula. Cultural background influenced food preferences; Hispanic adolescents more frequently reported asking for more beans and eggs.*
- ***Referrals.*** *One of the important contributions of the WIC Program is timely referral to other services. However, the proportion of adolescents who reported receiving referrals to other programs such as the Food Stamps Program or to other services such as childhood immunization was considerably lower than the level of referrals reported by WIC clinic directors. WIC clinics routinely provide informational materials about other services; however, WIC adolescents prefer active referrals in which the WIC clinic calls or makes an appointment for them.*

## 3.1. Introduction

### Chapter Organization

This chapter presents the overall findings of the study. The presentation is organized around five major areas:

- **A Profile of Adolescent WIC Participants.** Following the introduction, Section 3.2 presents a profile of the general characteristics of adolescent WIC participants. To facilitate readability, key figures and tables on this topic are included in the text of this chapter, while detailed tables are presented in the Appendices (for this topic, **Appendix F**).
- **Outreach and Enrollment.** Early enrollment in WIC, particularly early enrollment of pregnant women, is essential if mothers and their children are to obtain the greatest benefit from WIC supplemental foods, and from the WIC services. Outreach issues may be particularly important for adolescents, since most of them will not have participated in WIC before. Factors affecting enrollment are explored in Section 3.3 (with detailed tables in **Appendix G**).
- **Nutrition Issues.** The nutrition knowledge and beliefs of adolescents are explored next in Section 3.4 (with detailed tables in **Appendix H**). This section includes information on the nutrition education methods and topics preferred by WIC adolescents.
- **WIC Food Packages.** The use of the WIC food package by adolescents and the perceived adequacy of the amounts received are presented in Section 3.5 (and in **Appendix I**).
- **Referral to Other Services.** Referral to other health, social and welfare services is an important benefit of participation in the WIC Program. This area is explored in Section 3.6 (with detailed tables in **Appendix J**).

The overarching conclusions from these findings are discussed in Chapter 4. In addition, detailed tables derived from the survey of clinic directors are presented in **Appendix K**.

### National Estimates

The Adolescent WIC Participants Study is based upon a multi-stage survey using a clustered sampling design as described in **Appendix A**. The data base for analysis included a

total of 297 WIC clinic directors in 44 States and 2,649 WIC adolescents. The participating WIC adolescents were all aged 14 through 19 and all visited a WIC clinic at least once during a 60-day period in the first half of 1997. While this procedure would have included most WIC adolescents, the sample does not include the small fraction of WIC participants who did not visit a WIC clinic during the study period. Also, WIC adolescents who came to a WIC clinic more than once during the study period would have had a higher probability of selection. Given the way the WIC Program typically operates, however, the operational definition used in sampling resulted in a sample frame that covered the population of WIC adolescents.

This sampling design is the basis for all national estimates presented in the detailed tables in this chapter and in Appendices F through K. Due to the sampling design, the study team used a design-based statistical package to support valid statistical analyses. The national estimates presented in this report were therefore produced using SUDAAN<sup>®</sup>, a software package developed by RTI for analyzing data from complex sample surveys. **Appendix E** provides an example SUDAAN program along with the resulting output. Because this analysis might have resulted in a different sample of WIC clinics and adolescent WIC participants, random samples are subject to sampling variability. In order to judge the precision of an estimate, the tables in this report include the standard errors of each estimate. In 95% of all samples, the true value of a particular estimate will be included within plus or minus 1.96 times the standard error from the estimated value.

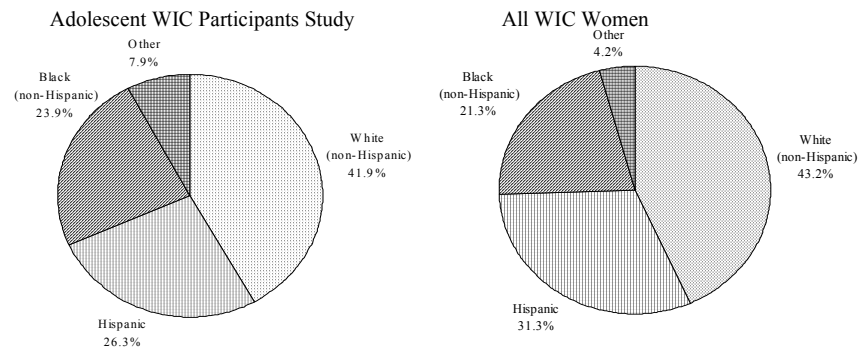
### **Study Caveats**

This study achieved a 96.1% response rate among WIC clinic directors and a 53.8% among WIC adolescents. Thus, estimates of WIC adolescents could be biased due to the self-selection of the adolescents who chose to cooperate with the study. Observational reports suggest that nonresponse was often associated with childcare or transportation issues (e.g., needing to get a ride home with the friend or relative who drove an adolescent to the WIC clinic) rather than to differences in demographic background. Moreover, the study group sought to minimize the impact of response rate by using analysis weights which adjusted nonresponse (as described in **Appendix D**). To adjust for the effects of clinic characteristics, the adjustment process for the adolescent WIC participant analysis weight was done separately within each WIC

clinic. In addition, information from the field sampling sheets was used to adjust for the effects of race/ethnicity. Nonetheless, study findings should be generalized to the entire WIC population only with appropriate caution.

Still, response rates were roughly comparable for different racial/ethnicity groups: 56.5% among blacks, 54.6% among Hispanics, and 49.3% among whites. Indeed, the fact that response rates were slightly higher among blacks and Hispanics, groups that are often at greater financial need, suggests that the survey did a reasonably good job of characterizing the experience of the most economically needy WIC adolescents. For instance, in 1996 the proportion of all WIC women with household incomes below 50% of the poverty level was 42.0% for blacks, 33.9% for Hispanics, and 26.8% for whites.<sup>2</sup> Also, the overall demographic characteristics of the sample reflected the race/ethnicity characteristics of the total population of WIC women in 1996 (see Table 2.4 page 2-9 **Figure 3.1**). These findings suggest that the results of this initial survey can be used with some confidence to support the WIC Program’s planning efforts to best meet the needs of adolescents.

**Figure 3.1 Race/Ethnicity of Respondents in the Adolescent WIC Participants Study and of All Women WIC Participants in 1996**



Source: USDA, *Study of WIC Participant and Program Characteristics 1996*, Exhibit 3.3, 1998

<sup>2</sup> Food and Nutrition Service, USDA, *Study of WIC Participant and Program Characteristics 1996*, Exhibit 4.9, pages 56-57, 1998. These estimates include adolescents.

## 3.2 Profile of Adolescent WIC Participants

*WIC adolescents appear to be a vulnerable population; 52% had currently completed no more than a tenth grade education, and 82% have never been involved with WIC before, making outreach an important issue.*

### Study Issues

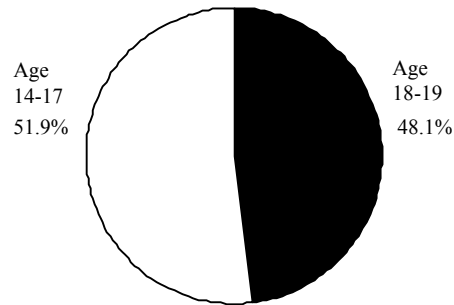
An initial objective of this study was to describe the characteristics of adolescents who participate in the WIC Program, since this can help in planning to better meet the needs of this audience. Pregnant adolescents often have not completed their growth and therefore are not fully developed physiologically. Pregnancy in growing adolescents therefore creates a dual demand for growth in both the mother and fetus which can result in higher health risks for the pregnant mother and the infant after birth. Infants born to teenagers tend to have a higher rate of low birthweight, a known risk factor for neonatal and infant mortality (Cross, 1992; Nestle, 1992).

Accordingly, one of the key issues underlying this study was the extent to which WIC adolescents were different from the general WIC population and so might have special needs that should be considered in developing program activities. Because this is the first study to have been undertaken with WIC adolescents, a basic profile of WIC adolescents is a useful starting point for thinking about how best to meet the needs of this population.

### Study Findings

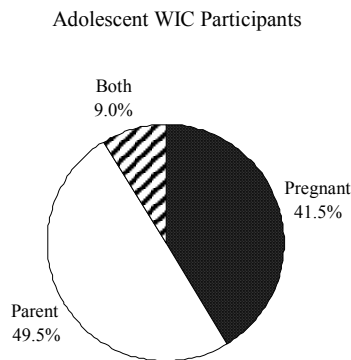
As shown in **Figure 3.2**, about one half of WIC adolescents are under 18 years of age, while the remaining ones are 18 or 19 years old. Analysis of their background paints a portrait of a vulnerable population that deserves special attention. This section starts by comparing the background characteristics of WIC adolescents and the total population of WIC women (this comparison is detailed in **Appendix F**).

**Figure 3.2 Age of Adolescent WIC Participants**



**Pregnant and Parenting Status.** An estimated 164,746 adolescents were served by the WIC Program during the 60-day study period.<sup>3</sup> As seen in **Figure 3.3**, roughly half (50.5%) of WIC adolescents were pregnant, 49.5% were parenting an infant or a child, while 9% were both pregnant and parenting. Previous WIC studies were unable to estimate the number of adolescents who were parenting a WIC infant or child; estimates from this study indicate that during the 60-day study period the WIC Program served about 96,400 adolescent parents.

**Figure 3.3 Parenting Status of Adolescent WIC Participants**



<sup>3</sup> This estimate was generated by weighting from an unduplicated sample of the WIC adolescents in sampled clinics during the 60-day data collection period. This is somewhat different from estimates derived from “average monthly participation” in which participation during each individual month is counted separately.



**Race/Ethnicity.** The racial/ethnic distribution of adolescents closely matches the distribution observed for all WIC clients in the 1996 WIC Participants and Program Characteristics Study (PC96) (see **Table 3.1**, and refer back to **Figure 3.1**): 41.9% of WIC adolescents were white, 23.9% black, 26.3% Hispanic, and 7.9% reported being of some other race/ethnicity. The corresponding numbers from PC96 for all WIC women were 43.2% white, 21.3% black, 31.3% Hispanic, and 4.2% other race/ethnicity (Food and Nutrition Service, USDA, 1998).

**Age Distribution.** Nearly equal percentages of the adolescents were either 17, 18, or 19 years of age — 24.3, 25.3 and 22.9 respectively — while 17.3% were 16 years of age, 6.5% were 15 years of age, and 3.8% were 14 years of age (see **Table 3.2**). The study design did not allow for interviewing of adolescent WIC participants below the age of 14. This design issue implies that nearly 17,000 adolescents were either 14 or 15 years of age and received WIC services during the 60-day study period.

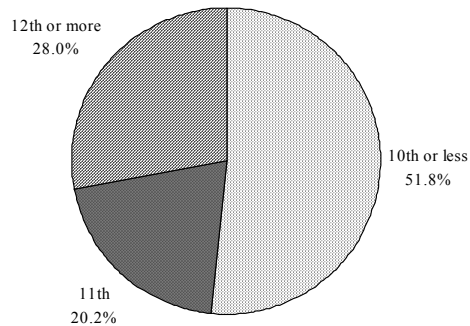
**Education.** As described in **Table 3.3** and seen in **Figure 3.4**, 28.0% of WIC adolescents had completed the 12<sup>th</sup> grade or more of schooling, while 48.2% had completed the 11<sup>th</sup> grade or more. This roughly matches the percentage of 18 and 19-year-old adolescents in the study. However, this leaves over half of the adolescents with a 10<sup>th</sup> grade education or less. This study did not ascertain whether adolescents had dropped out of school or whether they were continuing their education. To the extent that the latter is the case, the proportion of WIC adolescents who eventually graduate from high school will be higher than indicated by their current educational level. On the other hand, the current education level does provide information about the reading ability of WIC participants in terms of current comprehension levels. Combined with their young ages, this makes the adolescents a less sophisticated group that may require special procedures within the WIC Program.

<b>Table 3.1 Distribution of Respondents' Race/Language</b>	
<b>Race/Language</b>	<b>Percentage</b>
White	41.9%* (4.7%)
Black	23.9% (3.8%)
Spanish Speaking Hispanic	7.2% (1.6%)
English Speaking Hispanic	19.1% (2.7%)
Other**	7.9% (4.5%)
<b>Total***</b>	100%
<p>* Standard errors for percentage figures are in parentheses  ** The "other" category includes American Indian, Alaskan native, Asian, and Pacific Islander.  *** Percentages may not total to exactly 100% due to rounding.</p>	

<b>Table 3.2 Distribution of Respondents' Age</b>	
<b>Age</b>	<b>Percentage</b>
14 years old	3.8%* (0.8%)
15 years old	6.5% (0.9%)
16 years old	17.3% (1.7%)
17 years old	24.3% (2.6%)
18 years old	25.3% (2.2%)
19 years old	22.9% (2.3%)
<b>Total**</b>	100%
* Standard errors for percentage figures are in parentheses ** Percentages may not total to exactly 100% due to rounding.	

<b>Table 3.3 Distribution of Last Grade Respondent Completed</b>	
<b>Last Grade Completed</b>	<b>Percentage</b>
8th Grade or Less	13.5%* (1.5%)
9th Grade	17.2% (1.7%)
10th Grade	21.1% (2.1%)
11th Grade	20.2% (2.0%)
12th Grade	22.6% (2.2%)
More than High School	5.4% (0.9%)
<b>Total**</b>	100%
* Standard errors for percentage figures are in parentheses ** Percentages may not total to exactly 100% due to rounding.	

**Figure 3.4 Education of Adolescent WIC Participants**



**Prior WIC Participation.** Four-fifths (81.9%) of WIC adolescents had not participated in WIC before (see **Table 3.4**): approximately 73.0% of WIC adolescents were enrolled in WIC for the first time, and an additional 8.9% of the adolescents were not enrolled in WIC themselves, but were parenting a WIC infant or child. In contrast, 14.3% of the adolescents were enrolled for the second time and 4.0% had been enrolled three or more times. Thus, a substantial number of the adolescents had not had previous contact with the WIC Program.

**Employment.** Nearly a quarter (24.2%) of WIC adolescents reported working for pay at a job (see **Table 3.5**). Work was also common among young adolescents: 13.0% of 14 year olds and 20.4% of 15 years reported working for pay at a job. Furthermore, **Table 3.6** shows that the percentage who report working does not vary greatly between pregnant and parenting adolescents (27.8% versus 21.8%).

**Table 3.4**  
**Distribution of Number of Times Respondent Enrolled in WIC**

Number of Times Enrolled in WIC	Percentage
Not Enrolled	8.9%* (1.1%)
One	73.0% (2.0%)
Two	14.3% (1.7%)
Three or more	3.8% (0.6%)
<b>Total**</b>	100%
<p>* Standard errors for percentage figures are in parentheses  ** Percentages may not total to exactly 100% due to rounding</p>	

**Table 3.5**  
**Distribution of Adolescents by Age and Employment Status**

<b>Currently Work for Pay</b>	<b>Respondents Age</b>						<b>Total**</b>
	<i>14 years old</i>	<i>15 years old</i>	<i>16 years old</i>	<i>17 years old</i>	<i>18 years old</i>	<i>19 years old</i>	
Yes	13.0%* (5.8%)	20.4% (9.3%)	11.6% (2.2%)	19.5% (4.5%)	29.0% (3.5%)	36.5% (4.3%)	24.2% (2.6%)
No	87.0% (5.8%)	79.6% (9.3%)	88.4% (2.2%)	80.5% (4.5%)	71.0% (3.5%)	63.5% (4.3%)	75.8% (2.6%)
Total	100%	100%	100%	100%	100%	100%	100%

\* Standard errors for percentage figures are in parentheses.  
 \*\* Row percentages may not total to exactly 100% due to rounding.  
 Note:  $X^2 = 23.2$ ;  $df = 5.0$ ;  $p\text{-value} = 0$

**Table 3.6**  
**Distribution of Adolescents by Parenting Status and Employment Status**

<b>Currently Work for Pay</b>	<b>Respondents Parenting Status</b>			<b>Total**</b>
	<i><b>Pregnant</b></i>	<i><b>Parenting</b></i>	<i><b>Both</b></i>	
Yes	27.8%* (3.9%)	21.8% (3.2%)	20.6% (3.5%)	24.2% (2.6%)
No	72.2% (3.9%)	78.2% (3.2%)	79.4% (3.5%)	75.8% (2.6%)
Total	100%	100%	100%	100%

\* Standard errors for percentage figures are in parentheses.

\*\* Row percentages may not total to exactly 100% due to rounding.

Note:  $X^2 = 1.7$ ;  $df = 2.0$ ;  $p\text{-value} = 0.43$



**Breastfeeding.** The data from this study are consistent with data from PC96 that suggest that the frequency of breastfeeding is higher among Hispanic women than among white women or among blacks. Data for all breastfeeding and postpartum WIC women in 1996 found that 47.3% of Hispanic women were certified as breastfeeding, compared to only 34.4% of white women and 24.5% of black women (see **Table 3.7**).<sup>4</sup>

**Table 3.7 WIC Participation Category for All WIC Women at Time of Certification by Race/Ethnicity**

Characteristic	White	Hispanic	Black	Other	Total
Pregnant women	49.7%	54.9%	51.1%	43.2%	49.4%
Breastfeeding women	17.3%	21.3%	12.0%	22.8%	18.6%
Postpartum women	33.0%	23.8%	37.0%	34.0%	32.0%
Breastfeeding women as a percent of breastfeeding and post-partum women	34.4%	47.3%	24.5%	40.1%	36.8%

Adapted from: USDA, *Study of WIC Participant and Program Characteristics 1996*. Exhibit 3.3. 1998. Note: This report did not include figures for “ever breast fed” which are likely to be higher than figures based on status at time of certification. This is because the question about “ever breast fed” was only reported for some states. Estimates include adolescents.

The data from the Adolescent WIC Study are consistent with this picture. Of WIC adolescents who are currently breastfeeding (**Table 3.8**), 38.9% are Hispanic, while Hispanic adolescents comprise only 26.3% of the breastfeeding and postpartum adolescents in the study. This is consistent with data on Hispanic women from PC96; Hispanic women comprised 26.7% of breastfeeding and postpartum WIC mothers, but 41.2% of the women who were breastfeeding at the time they were certified.

<sup>4</sup> These percentages were calculated by weighting each column percent by the US WIC total number of participants in the column and then calculating the percent in each WIC participation category by race/ethnicity.

**Table 3.8**  
**Distribution of Adolescents by Race/Language and Breastfeeding Status**

<b>Currently Breastfeeding</b>	<b>Race/Language</b>					<b>Total**</b>
	<i>White</i>	<i>Black</i>	<i>Hispanic Spanish Language</i>	<i>Hispanic English Language</i>	<i>Other</i>	
Yes	18.3%* (5.0%)	22.2% (4.9%)	14.5% (4.5%)	24.4% (6.4%)	20.6% (14.0%)	100%
No	37.1% (5.7%)	28.4% (5.3%)	4.6% (1.1%)	20.3% (2.9%)	9.5% (5.6%)	100%
Total	33.6% (5.2%)	27.3% (4.7%)	6.5% (1.6%)	21.1% (3.2%)	11.6% (7.4%)	100%

\* Standard errors for percentage figures are in parentheses.  
 \*\* Row percentages may not total to exactly 100% due to rounding.  
 Note:  $X^2 = 37.0$ ;  $df = 4.0$ ;  $p\text{-value} = 0$

In contrast, breastfeeding seemed to occur less frequently among white and black WIC adolescents. Only 18.3% of breastfeeding adolescents were white (**Table 3.8**), while PC96 reported that 39.9% of women who were breastfeeding at the time of certification were white. Finally, 22.2% of breastfeeding adolescents were black compared with the PC96 report that 13.6% of women who were breastfeeding at the time of certification were black. This suggests that among adolescents there may be higher than average rates of breastfeeding among Hispanic adolescents and lower than average rates of breastfeeding among white and black adolescents.<sup>5</sup> This can be an important issue to investigate further, because data from PC96 (shown in **Table 3.9**)<sup>6</sup> suggest that rates of breastfeeding may be lower among WIC adolescents than among older WIC women. While this study is unable to provide detailed information on this topic, it may merit research in future studies.

**Table 3.9 WIC Participation Category at Time of Certification by Age**

Characteristic	Under 15	15 – 17	18 -34	35 or more	Total
Pregnant women	66.5%	43.5%	49.5%	41.8%	49.4%
Breastfeeding women	5.4%	17.1%	18.8%	29.8%	18.6%
Postpartum women	28.0%	39.4%	39.4%	28.4%	32.0%
Breastfeeding as a percent of breastfeeding and postpartum women	16.2%	30.3%	32.3%	49.7%	36.8%

Adapted from: USDA, *Study of WIC Participant and Program Characteristics 1996*. Exhibit 3.1. 1998. This report did not include figures for “ever breast fed” which are unlikely to be higher than figures based on status at time of certification. This is because the question about “ever breast fed” were only reported in some States. Estimates include adolescents.

<sup>5</sup>Because of concerns about response burden, this study did not ask all the questions needed to establish the rates of initiation or duration of breastfeeding among adolescents. More detailed information about the breastfeeding practices of WIC participants can be found in the report by USDA, *WIC Infant Feeding Practices*, 1997.

<sup>6</sup> These percentages were calculated by weighting each column percent by the number in the group, and then calculating the percent in each WIC participation category by age group.

### 3.3 Enrollment in the WIC Program

*Substantial numbers of WIC adolescents fail to enroll in WIC during their first trimester. Over 60% of WIC clinic directors estimate that most adolescents fail to enroll in the WIC Program until after their first trimester of pregnancy; among WIC adolescents themselves, 44.4% reported enrolling after their first trimester. It is clear that timely enrollment needs to be encouraged. Efforts to increase timely enrollment need to address the barriers to such enrollment, including failure to recognize that one is pregnant, lack of awareness about WIC, reluctance to accept WIC assistance, and transportation. The most common source of information about WIC comes from family members*

#### Study Issues

For those eligible, timely enrollment in the WIC Program will allow participants to derive the maximum benefit from WIC nutrition education, referral to other services and the supplemental foods that WIC provides. Thus, it is important to understand when and why adolescents enroll in the WIC Program.

The following section describes the timing during pregnancy of enrollment and factors that are perceived as barriers to enrollment. This section draws on the perceptions of adolescents in the surveys, comments from focus groups, and the perceptions of WIC clinic directors.

#### Timing of Enrollment

**Considering Enrollment.** Table 3.10 presents the number of months pregnant when the adolescents first thought about enrolling in WIC by the age of the adolescents. For all adolescents, a high percentage (68.3%) considered WIC during the first trimester of pregnancy. It appears that older adolescents considered WIC earlier than younger adolescents. For example, only 12.6% and 10.2% of 18 and 19 year old adolescents, respectively, first considered WIC after the fourth month of pregnancy, while the same percentage ranges from 23.0% to 31.9% for 14 to 17 year old adolescents.

**Table 3.10**  
**Timing of WIC Enrollment: Pregnancy Status of Adolescent When They First Thought About WIC Enrollment, By Age of Adolescent**

Respondent's Age	Number of Months Pregnant When Thought About WIC					Total**
	<i>One</i>	<i>Two</i>	<i>Three</i>	<i>Four</i>	<i>More Than Four Months</i>	
14 years old	27.6%* (11.2%)	15.7% (11.4%)	26.2% (14.6%)	7.5% (5.5%)	23.0% (16.4%)	100%
15 years old	2.7% (1.8%)	18.5% (6.6%)	22.0% (6.4%)	25.0% (9.5%)	31.9% (12.0%)	100%
16 years old	14.5% (3.9%)	22.0% (7.3%)	31.2% (6.8%)	8.8% (3.0%)	23.5% (4.7%)	100%
17 years old	25.6% (9.0%)	20.8% (7.8%)	12.7% (5.2%)	14.2% (4.0%)	26.8% (6.7%)	100%
18 years old	23.6% (4.7%)	34.0% (6.1%)	18.9% (4.7%)	11.0% (3.1%)	12.6% (4.3%)	100%
19 years old	37.7% (11.0%)	20.2% (5.9%)	19.2% (4.9%)	12.6% (3.5%)	10.2% (3.5%)	100%
Total	25.3% (4.3%)	23.5% (3.3%)	19.5% (3.4%)	12.6% (1.8%)	19.1% (3.3%)	100%

\* Standard errors for percentage figures are in parentheses.

\*\* Row percentages may not total to exactly 100% due to rounding.

Note:  $X^2=122.9$ ;  $df=20$ ;  $p\text{-value}=0.00$

**Enrollment by Trimester.** The distribution of enrollment in the WIC Program while pregnant is shown in detail in **Tables 3.11** and **3.12** (which show the distribution of enrollment by trimester and month of pregnancy both by race and ethnicity/language<sup>7</sup>), and is presented in **Figure 3.5**. A high rate of enrollment during the first trimester is notable. Overall, 55.6% of adolescents reported enrolling in the first trimester (**Table 3.11**), with most of these first trimester enrollees enrolling during the second (21.3%) and third (22.6%) months of pregnancy (**Table 3.12**). Of those adolescents enrolling in WIC during pregnancy 61.3% enrolled in the first trimester. While the methodology for determination of trimester differs, this can be compared to 46.9% of all pregnant women enrolling in WIC during the first trimester as reported in PC96 - shown in the right-hand pie chart of **Figure 3.5**. This would suggest that earlier outreach may be appropriate for all eligible women and not just for eligible adolescents.

It also appears that white and Hispanic adolescents are more likely to enroll in the first trimester than black and other adolescents - 65.3% of white adolescents, 62.3% of Hispanic Spanish-language respondents, and 52.5% of Hispanic English-language respondents, but only 43.7% of black adolescents and 40.5% of Asian, Native American or other adolescents reported enrolling in WIC during their first trimester.

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<sup>7</sup> Adolescents were asked to recall, “How many months pregnant were you when you enrolled in the WIC Program?” They were asked to respond, “One month,” “Two months,” . . . “Seven months,” or “Eight months or more.” The first trimester of enrollment was defined by combining months 1, 2, and 3; the second trimester by combining months 4, 5, and 6; and the third trimester by combining months 7 and beyond. The distribution by trimester of WIC enrollment for all pregnant women was taken from PC96 where trimester was defined using date of enrollment and expected date of delivery.

**Table 3.11**  
**Timing of WIC Enrollment: Trimester in Which Adolescent Reported Enrolling**  
**in WIC, By Race/Language**

Race/Language	Timing of WIC Enrollment in Trimesters				Total**
	<i>First</i>	<i>Second</i>	<i>Third</i>	<i>After Baby Was Born</i>	
White	65.3%* (5.6%)	19.6% (3.5%)	8.4% (2.1%)	6.8% (1.4%)	100%
Black	43.7% (4.8%)	32.6% (4.4%)	8.1% (1.3%)	15.6% (4.7%)	100%
Spanish Speaking Hispanic	62.3% (5.9%)	22.0% (3.7%)	7.1% (2.8%)	8.7% (2.4%)	100%
English Speaking Hispanic	52.5% (3.1%)	30.6% (2.7%)	8.2% (1.5%)	8.7% (1.4%)	100%
Other***	40.5% (3.1%)	36.8% (3.2%)	13.4% (4.5%)	9.4% (6.8%)	100%
Total	55.6% (3.6%)	26.3% (2.6%)	8.7% (1.2%)	9.5% (1.2%)	100%

\* Standard errors for percentage figures are in parentheses.

\*\* Row percentages may not total to exactly 100% due to rounding.

\*\*\* The "other" category includes American Indian, Alaskan native, Asian, and Pacific Islander.

Note:  $\chi^2 = 35.1$ ;  $df = 12$ ;  $p\text{-value} = .01$

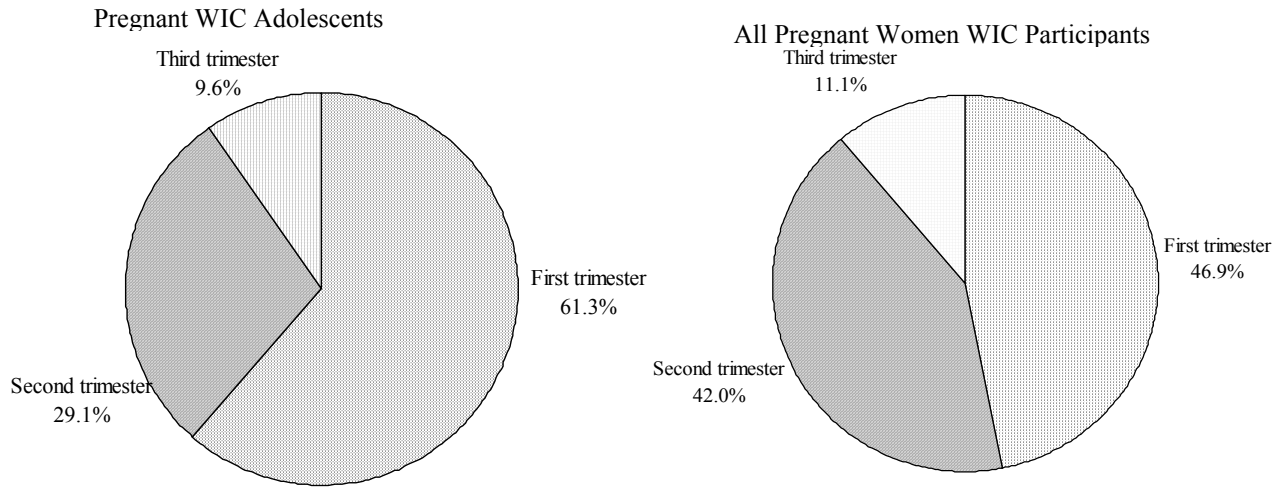
**Table 3.12**  
**Timing of Enrollment: Month of Pregnancy in Which Adolescent Reported Enrolling in WIC**

Race/Language	Timing of WIC Enrollment in Months										Total**
	<i>One</i>	<i>Two</i>	<i>Three</i>	<i>Four</i>	<i>Five</i>	<i>Six</i>	<i>Seven</i>	<i>Eight</i>	<i>Nine</i>	<i>Postpartum</i>	
White	13.5%* (3.7%)	24.2% (3.3%)	27.6% (4.5%)	6.3% (1.7%)	5.5% (1.4%)	7.8% (2.3%)	3.7% (1.1%)	4.8% (1.4%)	0.0% (0.0%)	6.8% (1.4%)	100%
Black	9.8% (2.7%)	19.6% (2.7%)	14.3% (1.9%)	12.3% (1.5%)	10.9% (2.8%)	9.4% (1.9%)	4.0% (1.0%)	4.2% (.9%)	0.0% (0.0%)	15.6% (4.7%)	100%
Spanish Speaking Hispanic	7.6% (1.9%)	30.1% (5.9)	24.5% (4.3%)	9.3% (2.0%)	6.6% (2.2%)	6.2% (1.6%)	2.3% (1.1%)	4.8% (2.6%)	0.0% (0.0%)	8.7% (2.4%)	100%
English Speaking Hispanic	9.9% (2.0%)	20.9% (2.0%)	21.8% (2.0%)	12.4% (1.2%)	8.5% (1.5%)	9.8% (1.2%)	5.1% (1.1%)	3.1% (.7%)	0.0% (0.0%)	8.7% (1.4%)	100%
Other***	15.9% (3.5%)	5.3% (3.8%)	19.3% (2.6%)	14.7% (3.6%)	19.2% (2.2%)	2.8% (2.3%)	0.6% (.5%)	12.8% (4.9%)	0.0% (0.0%)	9.4% (6.8%)	100%
Total	11.7% (2.2%)	21.3% (2.3%)	22.6% (2.2%)	9.8% (1.1%)	8.5% (1.4%)	8.0% (1.4%)	3.6% (.6%)	5.0% (1.1%)	0.0% (0.0%)	9.5% (1.2%)	100%

\* Standard errors for percentage figures are in parentheses.  
 \*\* Row percentages may not total to exactly 100% due to rounding.  
 \*\*\* The "other" category includes American Indian, Alaskan native, Asian, and Pacific Islander.  
 Note:  $\chi^2 = 146.7$ ;  $df = 32$ ;  $p\text{-value} = .00$



**Figure 3.5 Distribution of WIC Participants by Trimester of Enrollment**



Note: Chart for “Pregnant WIC Adolescents” represents data from Adolescent WIC Participants Study. Percentages are among adolescents who enrolled while pregnant. “All Pregnant Women” chart is adapted from: USDA, Study of WIC Participants and Program Characteristics 1996. Exhibit 3.2 excluding trimester not reported. Estimates include adolescents. See footnote 7 for information on methodological differences.

While adolescents report enrolling early in WIC, the majority of clinic directors do not believe that adolescents are enrolling early. **Table 3.13** compares the trimester that adolescents report enrolling in WIC with the trimester that clinic directors report believing that most adolescents enroll in WIC.<sup>8</sup> Interestingly, 39.5% of clinic directors believe that most adolescents enroll during the first trimester compared with 55.6% of adolescents who report enrolling during the first trimester. Conversely, 59.0% of clinic directors believe that most adolescents enroll during the second trimester compared with 26.3% of adolescents who report enrolling in the second trimester.

<sup>8</sup> Clinic directors were asked to report if most teenagers enrolled in WIC during their (1) first trimester, (2) second trimester, (3) third trimester, or (4) after they have had the baby. As noted above, adolescents were asked the number of months they were pregnant when they enrolled in WIC. The clinic director estimates are the percentage of directors and are not weighted by clinic participation. The purpose here is to compare clinic directors’ perceptions of how most adolescents behave with the reported behavior of adolescents.

**Table 3.13 Point in Pregnancy at Which Adolescents Enroll in WIC: Comparison of Clinic Directors’ Perceptions and Adolescents’ Reporting**

Perspective	First Trimester	Second Trimester	Third Trimester	After Baby Is Born	Total**
Adolescents	55.6% (3.6%)*	26.3% (2.6%)	8.7% (1.2%)	9.5% (1.2%)	100%
Clinic Directors	39.5% (5.3%)	59.0% (5.3%)	1.2% (0.5%)	.4% (.4%)	100%

\*Standard errors for percentage figures are in parentheses.

\*\*Row percentages may not total to exactly 100% due to rounding.

Because the anonymous nature of the study did not allow us to review individual clinic records, the study team was unable to resolve the discrepancy. We expect that claiming timely enrollment has sufficient social desirability for WIC adolescents, and that the actual percentages of enrollment are somewhat closer to the estimates provided by directors than those by adolescents themselves (39.5% vs. 55.6%, respectively). In fact, data from PC96 indicates that 53.2% of adolescents fail to enroll in the first trimester. Nonetheless, whichever source of information is utilized, it is clear that a significant proportion of WIC adolescents do not enroll in their first trimester of pregnancy. Given the importance of nutrition during the early months of pregnancy, WIC should clearly encourage timely enrollment in the Program.

### **Feedback about Strategies for Encouraging Timely Enrollment**

**Source of Learning about the WIC Program.** The survey asked adolescents where they learned about the WIC Program. **Table 3.14** presents the distribution of the first source of learning about the WIC Program by race/ethnicity. In general, all race/language groups appear to have first learned about the WIC Program from similar sources. By far, most adolescents first learned about WIC from a family member — 60.7 %. The next two most common sources were the health related sources of medical doctor or nurse (14.5%) followed by the Medicaid Program (10.8%). The Food Stamp Program was reported by only 3.4% of adolescents, and advertisements and brochures were each reported as the first source by less than 1% of adolescents. In focus groups, adolescent WIC mothers reported that they learned about WIC

**Table 3.14**  
**Source From Which Adolescent First Learned About WIC, By Race/Language**

Race/Language	Source for First Learning About Eligibility for WIC									Total**
	Food Stamp Program	Medicaid	Family Member	Social Worker	Counselor	MD or Nurse	Ads	Brochure	Other	
White	2.2%* (.7%)	15.1% (2.4%)	61.7% (4.2%)	1.8% (.6%)	1.2% (.5%)	12.0% (2.9%)	0.6% (.6%)	0.4% (.3%)	5.1% (2.3%)	100%
Black	3.5% (.9%)	10.5% (2.0%)	57.1% (4.1%)	4.5% (.9%)	2.7% (1.0%)	17.0% (2.5%)	1.4% (.7%)	1.4% (.8%)	2.0% (.7%)	100%
Spanish Speaking Hispanic	8.3% (3.0%)	6.5% (16%)	57.9% (5.4%)	7.1% (1.4%)	0.1% (.1%)	17.1% (4.5%)	0.8% (.5%)	1.3% (1.0%)	1.1% (.6%)	100%
English Speaking Hispanic	5.3% (1.4%)	7.3% (13%)	64.0% (2.6%)	3.4% (.7%)	2.4% (.5%)	13.4% (1.6%)	1.5% (.7%)	0.5% (.3%)	2.3% (.6%)	100%
Other***	0.6% (.5%)	1.7% (1.8%)	60.8% (3.1%)	13.5% (4.2%)	0.5% (.5%)	20.5% (2.7%)	0.0% (0.0%)	1.9% (1.8%)	0.5% (.4%)	100%
Total	3.4% (.5%)	10.8% (17%)	60.7% (2.6%)	4.0% (.8%)	1.7% (.4%)	14.5% (1.6%)	0.9% (.3%)	0.8% (.3%)	3.2% (1.1%)	100%

\* Standard errors for percentage figures are in parentheses.

\*\* Row percentages may not total to exactly 100% due to rounding.

\*\*\* The "other" category includes American Indian, Alaskan native, Asian, and Pacific Islander.

Note:  $X^2 = 243.0$ ;  $df = 32$ ;  $p\text{-value} = .00$

from multiple sources: their mothers, sisters, family, the health clinic and Medicaid doctors. This suggests that community outreach efforts educating family members about the importance of timely enrollment in the WIC Program will be important.

**Barriers to Enrollment.** Table 3.15 presents clinic directors’ perceptions about different issues that affect early enrollment for most pregnant adolescents, categorized into four major categories: issues associated with pregnancy, awareness of the WIC Program, stigma/attitudinal issues, and access issues.

**Table 3.15 Reasons Teenagers Do Not Enroll in WIC: Perceptions of Clinic Directors**

Reason for Not Enrolling in WIC	WIC Clinic Directors: “Very Often”	
	Percent	s. e.
<b>Pregnancy Issues:</b>		
Don’t know that they are pregnant	38.3%	(5.9%)
Not wanting others to know that they are pregnant	34.8%	(5.7%)
<b>Awareness Issues:</b>		
Lack of awareness about WIC	25.9%	(4.5%)
Belief that they do not need WIC services	16.6%	(4.1%)
Belief that they do not qualify for WIC	12.1%	(3.8%)
<b>Stigma/Attitudinal Issues:</b>		
Reluctance to ask for public assistance	15.6%	(4.4%)
Belief that they do not qualify for WIC services	12.1%	(3.8%)
Belief that the WIC Program has a welfare stigma	11.3%	(3.2%)
<b>Access Issues:</b>		
Lack of transportation	27.3%	(4.6%)
Don’t like WIC food	5.9%	(2.6%)
Inconvenient clinic location	5.7%	(3.1%)
Inconvenient hours of clinic operation	4.5%	(2.0%)
Waiting period to get an appointment to enroll in WIC	1.7%	(0.9%)

These same issues are also presented in **Table 3.16**, which provides more detailed response information. **Tables K.29** through **K.41** in **Appendix K** presents the information by type of WIC sponsoring agency—local governments, private agencies, and state governments. In general, the three types of WIC clinics provided very similar results concerning barriers to enrollment. Thus, this report confines its comments to the summary in **Table 3.15** that presents the percentages responding “very often.”

Pregnancy Issues. WIC clinic directors reported that WIC teens who did not enroll in a timely fashion for WIC often did not realize they were pregnant (38.3% of directors indicated that this was very often a barrier). Also, more than a third of WIC directors (34.8%) thought that teenagers were very often reluctant to let others know they were pregnant. This was consistent with findings from focus groups with youth who reported that “some girls may be embarrassed to ask for help or to tell their mother that they are pregnant.” One teenager reported that she had been reluctant to let others know she was pregnant, and another teenager reported that she had not thought she was pregnant since she had just begun taking the pill.

Awareness Issues. About a quarter of WIC clinic directors (25.9%) felt that a major reason for failing to enroll in the WIC Program was a lack of awareness about the WIC Program. A smaller proportion of WIC clinic directors reported that adolescents did not think that they needed WIC services (16.6%) or did not think that they would be eligible (12.1%). In focus groups, WIC adolescents reported that most mothers knew about the WIC Program. What they didn’t know as well was the fact that they might be eligible for the Program. For instance, a focus group of Hispanic mothers in Texas reported that there was some confusion about whether they were eligible.

**Table 3.16**  
**Frequency of Clinic Directors' Perception of Barriers to Enrollment by Type of Barrier, for All Clinic Directors**

<b>Barriers to Enrollment in the WIC Program</b>	<b>Frequency That Barriers Affect Decision to Enroll</b>			
	<i>Very Often</i>	<i>Sometimes</i>	<i>Rarely</i>	<i>Total**</i>
Inconvenient Hours of Clinic Operation	4.5% (2.0%)*	27.8% (4.8%)	64.7% (5.0%)	100%
Inconvenient Clinic Location	5.7% (3.1%)	17.5% (3.3%)	76.8% (4.1%)	100%
Lack of Transportation to the Clinic	27.3% (4.6%)	36.2% (5.1%)	36.5% (5.2%)	100%
Teenagers' Belief That They Do Not Need WIC Services	16.6% (4.1%)	46.5% (5.7%)	36.9% (5.3%)	100%
Teenagers' Belief That They Do Not Qualify For WIC Services	12.1% (3.8%)	39.5% (5.6%)	48.4% (5.7%)	100%
Teenagers' Lack of Awareness About WIC	25.9% (4.5%)	50.4% (5.7%)	23.8% (4.6%)	100%
Teenagers Don't Know They Are Pregnant	38.3% (5.9%)	40.2% (5.6%)	21.5% (4.4%)	100%
Teenagers' Belief That the WIC Program Has a Welfare Stigma	11.3% (3.2%)	36.2% (5.3%)	52.6% (5.7%)	100%
Teenagers Don't Like WIC Foods	5.9% (2.6%)	22.2% (4.0%)	72.0% (4.5%)	100%
Waiting Period to Get An Appointment and Enroll in WIC	1.7% (.89%)	16.0% (3.5%)	82.3% (3.6%)	100%
Teenagers Being Embarrassed to Be on WIC	4.2% (1.5%)	43.2% (5.4%)	52.5% (5.6%)	100%
Teenagers and Their Families' Reluctance to Ask For Public Assistance	15.6% (4.4%)	45.1% (5.5%)	39.3% (5.2%)	100%
Teenagers Not Wanting Others To Know That They Are Pregnant	34.8% (5.7%)	39.1% (5.1%)	26.1% (4.6%)	100%

\* Standard errors for percentage figures are in parentheses

\*\* Row percentages may not total to exactly 100% due to rounding.

While 12.1% of clinic directors felt that WIC adolescents very often failed to enroll in WIC because they did not think they would be eligible, survey data (shown in **Table 3.17**) indicates that about two-thirds of all adolescents knew about the WIC income requirement prior to enrollment.<sup>9</sup> White adolescents tended to know about the income requirement the most with 72.4% knowing before enrollment, while 60.5% of black adolescents knew about the income requirement. In addition, one of the focus groups with Hispanic teens in rural Texas found that teens often did not sign up for WIC because of eligibility issues related to legal status.

Access Issues. The most important access barriers cited by WIC clinic directors were lack of transportation to the clinic; over a quarter (27.3%) of clinic directors reported that transportation was very often a barrier preventing early enrollment. On the other hand, the focus group respondents rarely mentioned transportation as a difficulty.

In general, WIC clinic directors did not feel that the operations of WIC clinics were serious barriers to enrolling in WIC. Issues dealing with clinic operations were often cited as rarely being a barrier to early enrollment in WIC by adolescents:

- “Waiting period to get an appointment and enroll” is rarely a barrier (82.3%)
- “Inconvenient clinic location” is rarely a barrier (76.8%)
- “Inconvenient hours of clinic operation” is rarely a barrier (64.7%).

Clinic directors also tended to believe that adolescents’ not liking WIC foods was rarely a barrier to early enrollment (72.0%).

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<sup>9</sup> Because some WIC sites inform callers about income requirements over the telephone at the first call, it is possible that awareness of income requirements may come from the Program directly as well as from perceptions in the community.

**Table 3.17**  
**Adolescent's Knowledge of WIC Income Requirements Prior**  
**to Enrollment by Race**

Race	Knew Income Requirements for WIC		Total**
	Yes	No	
White	72.4%* (1.8%)	27.6% (1.8%)	100%
Black	60.5% (3.4%)	39.5% (3.4%)	100%
Hispanic	68.5% (2.0%)	31.5% (2.0%)	100%
Other***	60.8% (3.0%)	39.2% (3.0%)	100%
Total	67.6% (1.6%)	32.4% (1.6%)	100%

\* Standard errors for percentage figures are in parentheses.

\*\* Row percentages may not total to exactly 100% due to rounding.

\*\*\* The "other" category includes American Indian, Alaskan native, Asian, and Pacific Islander.

Note:  $X^2=13.6$ ;  $df=3$ ;  $p\text{-value}=.01$



In contrast, a number of focus group respondents felt that a barrier to Program participation could arise from long waits to obtain a visit, with some teens reporting waiting 2 - 3 hours. Whether or not long waits or inconvenient hours are a barrier to initial WIC participation, they can affect the willingness of young women to follow through on referrals for other services. Also in several of the focus groups, teens talked about WIC clinic hours conflicting with school and work and wanted clinics to add evening and weekend hours.

Stigma/Attitudinal Issues. Most WIC clinic directors did not seem to think that adolescents were influenced by WIC being a welfare program; 52.6% reported that adolescents were rarely influenced by the belief that the WIC Program has a “welfare stigma”, while 52.5% of the clinic directors felt that adolescents’ embarrassment to be on WIC rarely affected their decision on whether or not to enroll (**Table 3.16**). The stigma of receiving public assistance was reported as very often a deterrent against participation by only about 11% of WIC clinic directors.

The survey did not raise the issue of stigma directly. However, several teens in focus groups expressed feelings of embarrassment for enrolling in WIC and viewed WIC as synonymous with welfare. For instance, participants in North Carolina felt that they would be surprised to learn that other teens did not know about WIC. Rather, they said that teens choose not to enroll on WIC because they are lazy or think there is a stigma attached to it. Teenage mothers also mentioned embarrassment at being “seen by others to be living off the government” as barrier to WIC participation. Several focus group respondents reported that stores made them feel uncomfortable for taking extra time to use the WIC cards. On the other hand, in focus groups, teens mentioned that they felt comfortable in WIC clinics “because there’s lots of others like us here and the staff is very nice.”

### **3.4 Nutrition and Nutrition Education**

*WIC adolescents find that WIC nutrition education services are useful. They learn from nutrition education sessions and apply what they learn. Reports of learning were higher among adolescents who had attended the WIC clinic more than two times. There is also some evidence that nutrition education was particularly helpful with Spanish-speaking Hispanic adolescents.*

*WIC adolescents were particularly interested in information about how to stretch their food dollar, and pregnant and breastfeeding adolescents were interested in learning how to introduce solid foods to their infants. They liked classes in which they could interact with other teenagers. However, many WIC adolescents were reluctant to come to additional sessions, and nutrition education efforts need to recognize that a primary source of nutrition information remains an adolescent's family.*

## **Study Issues**

Nutrition education is an important component of the WIC Program. Nutrition education and counseling teach WIC adolescents how to use WIC foods and encourage positive changes in eating habits. Nutrition counseling also promotes breastfeeding and, if needed, refers participants for substance abuse treatment.

Adequate nutrition can be a particular challenge for adolescent WIC participants. Pregnant teenagers are often still growing and so need to provide nutrition both for their own bodies as well as for their infants. In addition, female adolescents may be overly concerned with weight control and frequently resort to dieting, skipping meals and snacking. Female adolescents consume more than the optimum amount of fat, added sugar, and protein. Adolescent females also tend to eat smaller than recommended amounts of fruits, vegetables and milk. They consume less than recommended amounts of essential nutrients such as calcium, folic acid, iron, and other minerals and vitamins (Contento et al., 1995; Nestle, 1992).

WIC nutrition education and counseling are intended to help adolescents to deal with these types of issues. Nutrition education addressing the attitudes and myths common to pregnant teenagers can help to facilitate the health of both the pregnant mother and her infant. Also, once the infant is born, nutrition education helps to encourage breastfeeding and improve the nutrition of the infant as well as the mother.

With adolescents, nutrition education faces special challenges. First, because adolescents tend to have less education, educational activities, information and materials may not be as easily understood by adolescents as by older mothers. Second, nutrition education often needs to be delivered in a limited amount of time and during a limited number of contacts with participants.

Classes need to be interesting and relevant enough to command the interest of adolescents. Finally, nutrition education needs to recognize that nutrition habits are grounded in the cultural and family practices of an adolescent. Hence, nutrition education often needs to start with an assessment of a participants' current eating habits and preferences, since these can provide the foundation for improving diet.

### **Beliefs About Nutrition**

Professionals take the importance of nutrition and health as a given. Adolescents, however, are known for their tendency to ignore the longer term consequences of their actions. Hence, as a starting point for planning, we asked adolescents what they believed about the importance of nutrition and the role that nutrition plays in health.

**Beliefs about Nutrition and Infant Health.** Questions about beliefs on nutrition were asked of WIC adolescents so that information points to areas where the WIC nutrition education program might be further strengthened.<sup>10</sup> When pregnant adolescents were asked if what they ate while pregnant would affect their baby's health, 81.8% agreed that it would, 9.8% disagreed, while 8.4% were not sure (**Table 3.18**). Hispanic adolescents who chose to take the interview in Spanish, referred to as Spanish-speaking Hispanic adolescents, were much less likely to agree that what they ate while pregnant would affect their baby; **Figure 3.6** shows that only 52.9% of this group agreed, compared to 85.5%, 79.3% and 83.9% of white, black, and English-speaking Hispanic adolescents, respectively. Thus, the Spanish-speaking Hispanic adolescents are in much greater danger of not understanding the importance of proper maternal nutrition during pregnancy. Spanish-speaking Hispanic adolescents shared a similar distribution by years of education with all other adolescents, while Spanish-speaking Hispanic adolescents tended to be slightly older than all other adolescents (57.5% versus 47.5% being 18 or 19 years old, respectively). It does not appear that these demographic factors would in themselves account

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<sup>10</sup> It was not possible to determine if WIC nutrition education was provided before or after the completion of the interview.

**Table 3.18**  
**Percentage of Pregnant Adolescents Believing That What They Eat**  
**Will Affect Their Baby, By Race/Language of Adolescent**

Race/Language	Pregnancy-Eating Will Affect Baby			Total**
	<i>Agree</i>	<i>Disagree</i>	<i>Not Sure</i>	
White	85.5%* (4.2%)	7.3% (3.9%)	7.1% (2.3%)	100%
Black	79.3% (2.7%)	13.9% (2.5%)	6.8% (2.4%)	100%
Spanish Speaking Hispanic	52.9% (4.2%)	20.7% (5.0%)	26.5% (7.7%)	100%
English Speaking Hispanic	83.9% (2.7%)	9.1% (2.0%)	7.0% (1.5%)	100%
Other***	93.5% (4.4%)	2.5% (2.0%)	4.0% (3.0%)	100%
Total	81.8% (2.2%)	9.8% (2.0%)	8.4% (1.4%)	100%

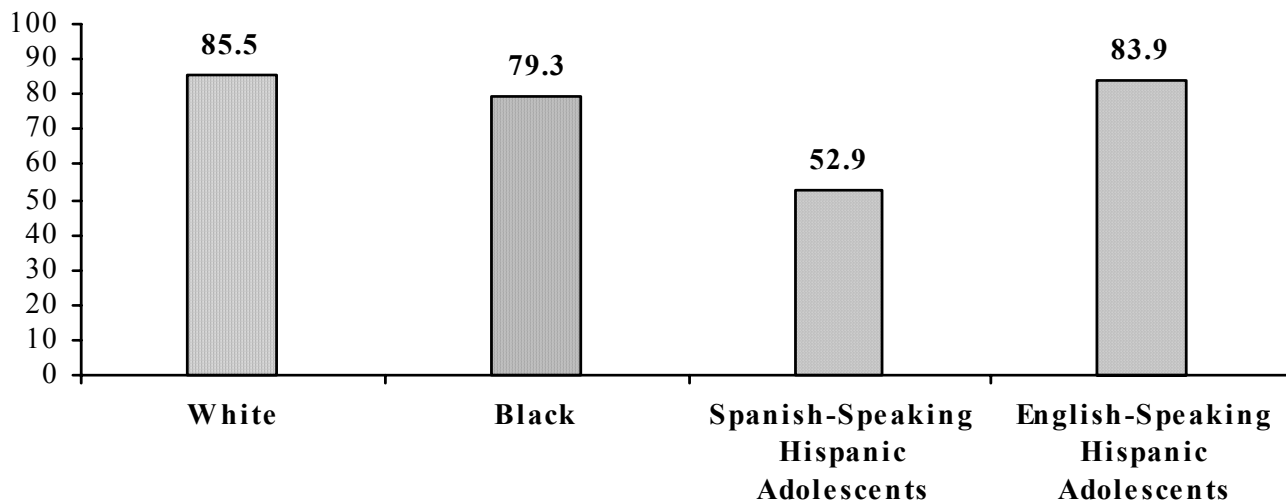
\* Standard errors for percentage figures are in parentheses.

\*\* Row percentages may not total to exactly 100% due to rounding.

\*\*\* The "other" category includes American Indian, Alaskan native, Asian, and Pacific Islander.

Note:  $X^2 = 18.7$ ;  $df = 8$ ;  $p\text{-value} = .04$

**Figure 3.6 Percentage of Pregnant Adolescents Who Believe That What They Eat Will Affect Their Baby**



for these differences. On the other hand, Hispanic adolescents who took the interview in English reported believing much like all of the other non-Hispanic WIC adolescents.

**Beliefs about Weight Gain During Pregnancy.** A somewhat similar pattern of response is found in **Tables 3.19** and **3.20** concerning weight gain during pregnancy. About one-third of pregnant adolescents reported agreeing that weight gain during pregnancy was not important, while 56.3% disagreed and 10.8% were not sure. Thus, over 43% of pregnant WIC adolescents either did not think or were unsure that weight gain during pregnancy was important.

Spanish-speaking Hispanic adolescents were at even greater risk on this point, with 49.8% agreeing that weight gain during pregnancy was not important, while 16.7% were not sure — a total of 66.5% either agreeing or not sure. Again, English-speaking Hispanic adolescents responded similarly to the non-Hispanic groups. Further, when pregnant adolescents were asked about how much weight should be gained during pregnancy, 10.4% reported 5 to 14 pounds, 36.6% 15 to 24 pounds, 50.6% 25 to 35 pounds and 2.3% more than 35 pounds (**Table 3.20**).

**Table 3.19**  
**Opinion of Pregnant Adolescents of Importance of Weight Gain During Pregnancy,**  
**By Race/Language of Adolescent**

Race/Language	Weight Gain Not Important			Total**
	<i>Agree</i>	<i>Disagree</i>	<i>Not Sure</i>	
White	27.4%* (5.0%)	62.4% (4.9%)	10.2% (2.7%)	100%
Black	37.8% (4.1%)	51.1% (4.6%)	11.2% (2.3%)	100%
Spanish Speaking Hispanic	49.8% (7.3%)	33.5% (5.6%)	16.7% (3.7%)	100%
English Speaking Hispanic	39.9% (3.5%)	49% (4.3%)	11.1% (2.3%)	100%
Other***	14.3% (8.3%)	81.8% (9.4%)	3.9% (2.3%)	100%
Total	32.9% (2.7%)	56.3% (2.8%)	10.8% (1.4%)	100%

\* Standard errors for percentage figures are in parentheses.

\*\* Row percentages may not total to exactly 100% due to rounding.

\*\*\* The "other" category includes American Indian, Alaskan native, Asian, and Pacific Islander.

Note:  $X^2 = 30.8$ ;  $df = 8$ ;  $p\text{-value} = .00$

**Table 3.20**  
**Opinion of Pregnant Adolescents of How Much Weight Should be Gained During Pregnancy, By Race/Language of Adolescent**

Race/Language	Opinion of Weight Gain During Pregnancy				Total**
	5- 14 lbs.	15- 24 lbs.	25- 35 lbs.	> 35 lbs.	
White	3.8%* (0.9%)	39.5% (5.4%)	55.3% (5.1%)	1.4% (0.6%)	100%
Black	13.8% (1.4%)	34.7% (3.5%)	48.1% (3.6%)	3.5% (0.7%)	100%
Spanish Speaking Hispanic	23.1% (2.9%)	36.9% (4.1%)	36.2% (4.3%)	3.8% (1.6%)	100%
English Speaking Hispanic	13.9% (1.7%)	35.7% (2.0%)	47.6% (2.5%)	2.8% (0.8%)	100%
Other***	17.1% (4.8%)	28.8% (3.9%)	53.2% (4.0%)	0.9% (0.8%)	100%
Total	10.4% (1.1%)	36.6% (2.6%)	50.6% (2.4%)	2.3% (0.4%)	100%

\* Standard errors for percentage figures are in parentheses.

\*\* Row percentages may not total to exactly 100% due to rounding.

\*\*\* The "other" category includes American Indian, Alaskan native, Asian, and Pacific Islander.

Note:  $\chi^2 = 78.5$ ;  $df = 12$ ;  $p\text{-value} = .00$

However, Spanish-speaking Hispanic adolescents were again at higher risk, with 23.1% thinking that only 5 to 14 pounds should be gained during pregnancy.

**Beliefs about Nutrition and Child Health.** Table 3.21 shows that 97% of WIC adolescents believed that their knowledge of nutrition information was important to their child's health. In contrast to the situation for maternal nutrition and weight gain during pregnancy, all of the race/language groups responded very similarly, with over 95% of each group agreeing.

### Sources of Nutrition Information

Designing effective nutrition education programs requires an understanding of the sources of nutrition information used by a target audience. Accordingly, the survey asked WIC adolescents from whom they obtain their nutrition knowledge. Adolescents were asked which of the following groups of persons did they depend on most for information about eating a healthy diet:

**Family Members or Relatives:**

- Mother or stepmother
- Father or stepfather
- Grandmother
- Aunt
- Baby's father
- Sibling

**Others:**

- Friend
- Teacher
- Doctor, nurse or health care provider
- WIC staff
- Some other person.

As shown in Table 3.22, WIC adolescents most commonly depend on their mother (or stepmother) for nutrition information (42.3%). The next major source of nutrition information is a health care provider (MD or nurse), with 26.1% of adolescents reporting this source. The third major reported source is WIC clinic staff (8.8%), followed by the baby's father (6.2%). Each of the other sources was reported by less than 5% of adolescents as being their major source of nutrition information.

This pattern is approximately the same for both pregnant and parenting adolescents. However, sources of nutrition information do vary somewhat according to the race and language of the adolescent (Table 3.23.) Over 10% of Black adolescents reported their grandmother as



**Table 3.21**  
**Percentage of Adolescents Believing That Their Knowledge of**  
**Nutrition Information is Important for Their Child's Health**

Race/Language	Nutrition Information is Important for a Child's Health			Total**
	<i>Agree</i>	<i>Disagree</i>	<i>Not Sure</i>	
White	97.0%* (0.84%)	1.3% (0.7%)	1.8% (0.7%)	100%
Black	96.5% (1.2%)	2.0% (1.0%)	1.5% (0.5%)	100%
Spanish Speaking Hispanic	99.5% (0.3%)	0.0% (0.0%)	0.5% (0.3%)	100%
English Speaking Hispanic	95.8% (1.3%)	1.5% (0.8%)	2.7% (0.8%)	100%
Other***	98.4% (1.4%)	1.2% (0.4%)	0.4% (0.4%)	100%
Total	97.0% (0.5%)	1.4% (0.4%)	1.7% (0.4%)	100%

\* Standard errors for percentage figures are in parentheses.

\*\* Row percentages may not total to exactly 100% due to rounding.

\*\*\* The "other" category includes American Indian, Alaskan native, Asian, and Pacific Islander.

Note:  $X^2 = 16.5$ ;  $df = 8$ ;  $p\text{-value} = .07$

**Table 3.22**  
**Reported Sources of Adolescent's Information About Healthy Diet,**  
**By Parenting Status of Adolescent**

Respondent's Parenting Status	Who Depend On For Healthy Diet Information											Total**
	<i>Mom/Step-mom</i>	<i>Dad/Step-dad</i>	<i>Grandmother</i>	<i>Aunt</i>	<i>Baby's Father</i>	<i>Sibling</i>	<i>Friend</i>	<i>Teacher</i>	<i>MD or nurse</i>	<i>WIC staff</i>	<i>Other</i>	
Pregnant	44.6%* (3.0%)	1.8% (0.7%)	5.5% (1.3%)	2.5% (0.8%)	6.4% (1.0%)	2.8% (1.0%)	2.4% (1.0%)	0.2% (0.2%)	26.6% (3.6%)	3.8% (0.7%)	3.4% (0.7%)	100%
Parenting	41.1% (2.4%)	1.7% (0.6%)	4.5% (0.8%)	1.6% (0.5%)	6.7% (1.0%)	1.6% (0.5%)	0.9% (0.3%)	0.3% (0.2%)	24% (2.1%)	12.6% (1.6%)	5.2% (1.2%)	100%
Both	38.4% (6.0%)	2.4% (1.4%)	3.9% (1.3%)	0.6% (0.4%)	2.2% (0.8%)	0.7% (0.4%)	1.9% (1.1%)	0% (0%)	35% (8.4%)	11.5% (3.8%)	3.5% (1.3%)	100%
Total	42.3% (2.0%)	1.8% (0.4%)	4.8% (0.8%)	1.9% (0.4%)	6.2% (0.6%)	2% (0.4%)	1.6% (0.4%)	0.2% (0.1%)	26.1% (2.3%)	8.8% (1.1%)	4.3% (0.7%)	100%

\* Standard errors for percentage figures are in parentheses.  
 \*\* Row percentages may not total to exactly 100% due to rounding.  
 Note:  $X^2 = 74.4$ ;  $df = 20$ ;  $p\text{-value} = .00$

**Table 3.23**  
**Reported Sources of Adolescent's Information About Healthy Diet,**  
**By Race/Language of Adolescent**

Race/Language	Person Adolescent Depends On For Healthy Diet Information											Total**
	<i>Mom/Step-mom</i>	<i>Dad/Step-dad</i>	<i>Grandmother</i>	<i>Aunt</i>	<i>Baby's Father</i>	<i>Sibling</i>	<i>Friend</i>	<i>Teacher</i>	<i>MD or Nurse</i>	<i>WIC staff</i>	<i>Other</i>	
White	42.6%* (2.8%)	2.8% (1.0%)	3.0% (1%)	2.4% (0.8%)	7.0% (1.1%)	1.5% (0.7%)	1.7% (0.8%)	0.2% (0.2%)	26.9% (4.0%)	5.7% (1.5%)	6.2% (1.4%)	100%
Black	40.5% (4.7%)	1.5% (0.9%)	10.7% (1.2%)	2.0% (0.7%)	3.0% (0.6%)	2.4% (0.8%)	0.7% (0.3%)	0.1% (0.1%)	27.8% (4.0%)	8.5% (1.5%)	2.8% (0.5%)	100%
Spanish Speaking Hispanic	37.7% (4.4%)	0.7% (0.4%)	4.9% (2.2%)	3.1% (1.3%)	13.9% (2.3%)	3.7% (1.5%)	4.7% (1.5%)	0.4% (0.4%)	12.3% (3.0%)	14.7% (4.6%)	4.0% (2.1%)	100%
English Speaking Hispanic	46.4% (2.7%)	1.0% (0.4%)	2.6% (0.8%)	0.7% (0.2%)	7.5% (1.4%)	2.7% (.8%)	1.8% (0.9%)	0.4% (0.4%)	22.2% (2.6%)	11.5% (1.5%)	3.3% (0.7%)	100%
Other***	40.3% (2.9%)	0.3% (0.3%)	2.0% (2.1%)	0.8% (0.8%)	2.1% (1.7%)	0.3% (0.3%)	0.7% (0.7%)	0.0% (0.0%)	37.1% (3.6%)	14.9% (3.3%)	1.5% (1.3%)	100%
Total	42.3% (2.0%)	1.8% (0.4%)	4.8% (0.8%)	1.9% (0.4%)	6.2% (0.6%)	2.0% (0.4%)	1.6% (0.4%)	0.2% (0.1%)	26.1% (2.3%)	8.8% (1.1%)	4.3% (0.7%)	100%

\* Standard errors for percentage figures are in parentheses.  
\*\* Row percentages may not total to exactly 100% due to rounding.  
\*\*\* The "other" category includes American Indian, Alaskan native, Asian, and Pacific Islander.  
Note:  $X^2=22851.5$ ;  $df= 38$ ;  $p\text{-value}= .00$

their main source of nutrition information, compared to less than 5% for each of the other race/language groups. Also, 13.9% of Spanish-speaking Hispanic adolescents reported the baby's father as their main source, with all the other race/languages reporting at most 7.5%. Spanish-speaking Hispanic adolescents made less use of health care providers for nutrition information (12.3% versus all other groups greater than 22%), and more use of the WIC staff (14.7% versus 5.7% of white and 8.5% of Black adolescents).

WIC clinic directors were also asked their perception of the people who influence the food choices of WIC adolescents. The directors were asked to rate as "a lot," "a little," or "not at all" the frequency that the following groups of people influenced adolescent food choices:

- Parents
- Friends
- Teachers
- Other family members
- WIC staff
- Health care professionals
- Husband, boyfriend, or father of the baby

WIC clinic directors overwhelmingly believe that friends are the major influence on adolescent food choices, with 85.4% reporting that the frequency of influence is "a lot" (see **Table 3.24**). Also, 65% of clinic directors reported that the frequency of influence is "a lot" for the husband, boyfriend or baby's father, and 50.6% for parents. And, clinic directors do not believe that teachers have much influence on adolescent food choices, with only 4.1% reporting that teachers have "a lot" of influence.

WIC clinic directors also were asked about the following factors that influence adolescent food choice:

- TV and radio
- Books and magazines
- Availability of food in the home
- Availability of food in the local stores
- Nutritional value of foods
- Convenience of preparation
- Cost of food
- Taste of food

As was done for people who influence adolescents, the directors were asked to rate as “a lot,” “a little,” or “not at all” the frequency that the above factors had on the food choices of adolescents.

<b>Table 3.24</b>				
<b>Frequency of Clinic Directors' Perception of People Who Influence WIC Adolescents' Food Choices, for All Clinic Directors</b>				
<b>People That Influence WIC Adolescents' Food Choices</b>	<b>Frequency That Food Choices Are Influenced</b>			
	<i>A Lot</i>	<i>A Little</i>	<i>Not At All</i>	<i>Total**</i>
Parents	50.6%* (4.9%)	43.8% (5.0%)	5.6% (1.9%)	100%
Friends	85.4% (3.2%)	13.9% (3.2%)	0.7% (0.4%)	100%
Teachers	4.1% (1.6%)	74.7% (4.0%)	21.2% (3.8%)	100%
Family	17.4% (3.2%)	78.4% (3.4%)	4.2% (1.2%)	100%
WIC Staff	31.2% (4.8%)	68.4% (4.8%)	0.5% (0.5%)	100%
Health Care Professionals	23.9% (4.3%)	73.5% (4.4%)	2.7% (1.1%)	100%
Husband, Boyfriend, or Father of Baby	65.0% (4.9%)	32.4% (4.8%)	2.6% (0.9%)	100%
* Standard errors for percentage figures are in parentheses				
** Row percentages may not total to exactly 100% due to rounding.				

As presented in **Table 3.25**, convenience of preparation and taste were both reported as influencing food choice “a lot” by about 95% of directors, with availability in the home reported as “a lot” by nearly 90%. Television and radio are thought by directors to be more influential than books or magazines, with 60.4% versus 20% reported as influencing food choice “a lot.” The nutritional value of foods clearly is thought by directors to be the least influential factor, with only 5.4% reporting the frequency of influence as “a lot.”

### **Nutrition Education Provided by the WIC Program**

The study next asked about nutrition education provided by the WIC Program. Adolescents were asked a series of questions designed to assess exposure to, interest in, and the usefulness of different nutrition education topics. The responses to these questions provide insight into the nutrition education provided to adolescents by the WIC Program. Questions were asked about each of 11 specific nutrition topics. This portion of the survey proceeded as follows:

- First, WIC adolescents were asked if they had received any information from WIC about each topic.
- Then, adolescents who had not previously received information on a topic were asked if they would like to receive information on the topic.
- Similarly, adolescents who had received information on a topic were asked if they had learned anything new from WIC on the topic.
- Finally, adolescents who reported learning something new from WIC on a topic were asked how likely they were to use the information.

All these questions were asked only of adolescents making their second or later WIC clinic visit, a sample size of 1,665 adolescents. This was done because adolescents could have been interviewed at the start of their first WIC clinic visit prior to the conduct of any WIC nutrition education.

**Receipt of Nutrition Education.** **Table 3.26** presents the percentages of adolescents who reported receiving information from WIC on each of the 11 nutrition topics. In general, a very high percentage of all WIC adolescents received information on most of the topics.

**Table 3.25**  
**Frequency of Clinic Directors' Perception of Factors Believed to**  
**Influence WIC Adolescents' Food Choices, for All Clinic Directors**

Factors That Influence WIC Adolescents' Food Choices	Frequency that Food Choices Are Influenced			
	<i>A Lot</i>	<i>A Little</i>	<i>Not At All</i>	<i>Total**</i>
TV/Radio	60.4%* (5.7%)	34.0% (5.7%)	5.6% (1.8%)	100%
Books/Magazines	20.0% (4.4%)	67.1% (5.7%)	12.9% (5.3%)	100%
Availability of Food in the Home	89.8% (2.9%)	10.2% (2.9%)	0.0% (0.0%)	100%
Availability of Food in the Local Stores	59.2% (5.2%)	28.4% (4.4%)	12.4% (3.3%)	100%
Convenience of Preparation	95.4% (1.3%)	3.7% (1.1%)	0.9% (0.7%)	100%
Nutritional Value of Foods	5.4% (2.0%)	74.4% (4.8%)	20.3% (4.8%)	100%
Cost of Food	56.6% (5.9%)	39.9% (6.0%)	3.6% (1.3%)	100%
Taste of Food	94.7% (1.7%)	5.2% (1.7%)	0.1% (0.1%)	100%

\* Standard errors for percentage figures are in parentheses

\*\* Row percentages may not total to exactly 100% due to rounding.

**Table 3.26**  
**Percent of Adolescents Who Report They Received Information About Various Nutrition Education Topics at WIC,**  
**by Race/Language of Adolescent**

Race/Language	Nutrition Education Topics										
	<i>Breastfeeding</i>	<i>Bottle Feeding</i>	<i>Feeding Solid Foods</i>	<i>How to Use WIC Foods</i>	<i>Get Most Food For Money</i>	<i>Healthy Eating Habits for Child</i>	<i>Weight Gain During Pregnancy</i>	<i>Smoking</i>	<i>Whole Milk for Baby</i>	<i>Substances During Pregnancy</i>	<i>Eating Healthy During Pregnancy</i>
White	87.3% (2.5%)	71.7% (4.5%)	53.9% (4.6%)	83.4% (3.5%)	53.4% (5.5%)	54.3% (5.6%)	77.5% (3.8%)	87.3% (3.1%)	35.2% (4.0%)	82.5% (3.5%)	89.7% (3.6%)
Black	80.4% (3.0%)	81.0% (2.4%)	64.4% (4.5%)	86.9% (1.9%)	51.6% (4.9%)	66.2% (5.4%)	80.7% (3.0%)	88.9% (1.7%)	42.6% (4.1%)	89.1% (2.4%)	96.5% (0.8%)
Spanish Speaking Hispanic	63.8% (7.0%)	54.8% (7.2%)	50.6% (6.3%)	75.8% (3.7%)	19.3% (4.3%)	52.2% (6.0%)	65.8% (5.3%)	75.0% (4.3%)	44.2% (6.9%)	79.4% (4.1%)	86.5% (2.9%)
English Speaking Hispanic	86.9% (2.2%)	75.1% (2.7%)	59.9% (3.1%)	87.0% (2.4%)	43.3% (4.9%)	62.3% (3.8%)	74.9% (2.3%)	83.3% (2.3%)	49.3% (3.3%)	86.4% (1.9%)	96.7% (1.1%)
Other**	94.3% (4.7%)	64.4% (3.7%)	43.9% (4.2%)	80.0% (1.8%)	28.3% (6.9%)	85.8% (10.7%)	90.1% (7.7%)	93.0% (5.5%)	9.6% (7.8%)	92.1% (6.3%)	95.1% (4.2%)
Total	84.7% (2.2%)	72.4% (2.3%)	56.1% (2.8%)	83.9% (1.6%)	46.0% (3.8%)	61.8% (4.6%)	78.3% (2.8%)	86.7% (2.1%)	37.4% (3.8%)	85.5% (2.1%)	92.9% (1.6%)
Statistics	X <sup>2</sup> = 8.5; df=4; p-value=.10	X <sup>2</sup> =10.8; df=4; p-value=.05	X <sup>2</sup> =5.97; df=4; p-value=.22	X <sup>2</sup> =9.9; df=4; p-value=.06	X <sup>2</sup> =22.1; df=4; p-value=.00	X <sup>2</sup> =10.8; df=4; p-value=.04	X <sup>2</sup> =8.6; df=4; p-value=.09	X <sup>2</sup> =10.0; df=4; p-value=.06	X <sup>2</sup> =11.35; df=4; p-value=.04	X <sup>2</sup> =7.0; df=4; p-value=.16	X <sup>2</sup> =12.2; df=4; p-value=.03

\* Standard errors for percentage figures are in parentheses.  
\*\* The "other" category includes American Indian, Alaskan native, Asian, and Pacific Islander.  
Note: Excludes adolescents attending their first WIC clinic visit.



When only parenting adolescents are considered, higher percentages reported receiving information on feeding solid foods and whole milk (69.4% and 41.4%, respectively). In **Table 3.26**, the pattern of response across race/language groups is similar for all adolescents; however, Hispanic adolescents who took the interview in Spanish were less likely to receive information for all 11 nutrition education topics. On the other hand, the English-speaking Hispanic adolescents reported receiving nutrition information at about the same rates as all adolescents combined. This indicates that Spanish-speaking Hispanic adolescents may be at greater risk than English-speaking Hispanic adolescents for not receiving adequate nutrition education from WIC.

**Interest in Different Nutrition Education Topics.** When we consider adolescents who had not previously received information on a particular nutrition topic from WIC, we find that many of them do desire to receive such information (**Table 3.27**). The study found that while Spanish-speaking Hispanic adolescents were less likely to have received nutrition information than all the other adolescent groups, they showed a much higher demand for nutrition information among those who did not receive it. Thus, it is unlikely that the lower rate of receipt of nutrition information among Spanish-speaking Hispanic adolescents results from not desiring such information.

**Effects on Learning.** Turning to adolescents who had received nutrition information from WIC on a particular topic, **Table 3.28** shows the percentages that reported learning something new. Overall, the vast majority of WIC adolescents reported learning something new from the information supplied by WIC. Again, Spanish-speaking Hispanic adolescents reported learning something new at substantially higher rates than all adolescents, while all other race/language groups were similar to the combination of all adolescents. This may indicate that Spanish-speaking Hispanic adolescents are in greater need of nutrition information than the remaining race/language groups of adolescents.

**Application of Information.** Next, those adolescents who had learned something new were asked how likely they were to use the information they had learned. These responses may be an indicator of the effects of nutrition education. Other research has found that “likelihood”

<b>Table 3.27: Percent of Adolescents Who Would Like to Receive Information on Nutrition Education Topics, By Race Language of Adolescent</b>											
<b>Race/Language</b>	<i>Breastfeeding</i>	<i>Bottle Feeding</i>	<i>Feeding Solid Foods</i>	<i>How to Use WIC Foods</i>	<i>Get Most Food For Money</i>	<i>Healthy Eating Habits for Child</i>	<i>Weight Gain During Pregnancy</i>	<i>Smoking</i>	<i>Whole Milk for Baby</i>	<i>Substances During Pregnancy</i>	<i>Eating Healthy During Pregnancy</i>
White	47.7%* (6.1%)	57.0% (3.7%)	68.7%* (3.6%)	40.3%* (9.2%)	71.8%* (3.5%)	72.1% (3.8%)	56.0%* (4.2%)	26.9%* (4.1%)	64.9%* (4.0%)	20.6%* (4.0%)	62.3% (2.8%)
Black	34.8% (4.7%)	59.9% (3.9%)	72.5% (4.0%)	50.8% (5.8%)	69.4% (3.4%)	68.8% (6.1%)	56.7% (6.7%)	37.2% (4.9%)	67.6% (4.8%)	33.5% (4.0%)	61.2% (6.9%)
Spanish Speaking Hispanic	65.4% (9.8%)	83.0% (5.6%)	87.7% (3.3%)	77.8% (7.3%)	84.4% (2.5%)	87.3% (4.0%)	84.9% (3.6%)	59.2% (5.7%)	90.5% (2.7%)	58.6% (5.0%)	83.4% (5.8%)
English Speaking Hispanic	49.7% (3.4%)	62.2% (4.3%)	77.5% (2.6%)	62.0% (8.3%)	76.3% (1.9%)	82.0% (2.2%)	58.8% (3.1%)	42.4% (2.3%)	75.1% (2.1%)	36.0% (2.7%)	67.2% (3.5%)
Other**	32.2% (7.7%)	51.6% (4.3%)	91.1% (6.2%)	85.1% (13.0%)	89.3% (8.5%)	79.1% (8.0%)	44.1% (9.2%)	22.0% (4.2%)	90.5% (7.6%)	21.2% (5.8%)	42.0% (11.4%)
Total	45.7% (3.4%)	60.3% (2.5%)	74.2% (2.5%)	55.3% (6.1%)	74.7% (2.3%)	74.6% (2.9%)	58.4% (2.8%)	34.8% (2.4%)	71.4% (3.0%)	29.1% (2.3%)	63.7% (2.4%)
Statistics	$\chi^2=14.5$ ; df=4; p-value=.01	$\chi^2=7.7$ ; df=4; p-value=.13	$\chi^2=11.0$ ; df=4; p-value=.04	$\chi^2=10.8$ ; df=4; p-value=.04	$\chi^2=11.0$ ; df=4; p-value=.04	$\chi^2=6.52$ ; df=4; p-value=.19	$\chi^2=14.9$ ; df=4; p-value=.01	$\chi^2=33.0$ ; df=4; p-value=.00	$\chi^2=21.1$ ; df=4; p-value=.00	$\chi^2=17.9$ ; df=4; p-value=.00	$\chi^2=7.7$ ; df=4; p-value=.13

\* Standard errors for percentage figures are in parentheses.  
\*\* The "other" category includes American Indian, Alaskan native, Asian, and Pacific Islander.  
Note: All percentages are among adolescents who had not previously received information on the topic.

**Table 3.28**  
**Percentage of Adolescents Reporting Learning Something New from WIC on Various Nutrition Education Topics,**  
**By Race/Language of Adolescent**

Race/Language	Nutrition Education Topics										
	<i>Breastfeeding</i>	<i>Bottle Feeding</i>	<i>Feeding Solid Foods</i>	<i>How to Use WIC Foods</i>	<i>Get Most Food For Money</i>	<i>Healthy Eating Habits for Child</i>	<i>Weight Gain During Pregnancy</i>	<i>Smoking</i>	<i>Whole Milk for Baby</i>	<i>Substances To Avoid During Pregnancy</i>	<i>Eating Healthy During Pregnancy</i>
White	64.1%* (4.8%)	59.9% (5.8%)	71.6% (5.1%)	71.6% (4.0%)	79.2% (8.4%)	81.0% (4.4%)	85.9% (3.5%)	79.7% (4.0%)	73.8% (5.8%)	71.2% (4.1%)	88.2% (2.7%)
Black	62.1% (5.1%)	59.0% (4.9%)	66.8% (5.4%)	70.5% (4.3%)	78.7% (4.5%)	80.1% (3.0%)	87.3% (2.5%)	81.5% (2.7%)	75.6% (3.7%)	77.2% (3.0%)	86.6% (2.5%)
Spanish Speaking Hispanic	87.2% (3.5%)	88.0% (3.3%)	92.0% (3.3%)	86.8% (3.2%)	86.5% (5.3%)	94.7% (2.5%)	90.1% (3.2%)	96.0% (2.1%)	92.1% (3.2%)	92.2% (2.5%)	88.9% (3.6%)
English Speaking Hispanic	79.7% (2.0%)	66.6% (4.0%)	80.0% (3.9%)	84.0% (2.0%)	84.3% (3.3%)	91.4% (1.9%)	84.6% (2.8%)	88.9% (2.2%)	80.8% (3.2%)	87.1% (2.7%)	91.4% (1.8%)
Other**	75.8% (4.0%)	63.0% (5.0%)	85.8% (10.8%)	88.1% (9.3%)	87.7% (8.8%)	95.3% (4.9%)	80.1% (2.8%)	80.0% (2.7%)	80.2% (8.5%)	79.7% (2.7%)	96.4% (3.9%)
Total	69.3% (2.8%)	63.0% (3.2%)	74.6% (3.2%)	76.4% (2.3%)	80.7% (3.4%)	85.6% (2.2%)	85.6% (1.6%)	82.9% (2.0%)	78.0% (2.8%)	78.1% (2.0%)	89.3% (1.3%)
Statistics	$\chi^2=21.5$ ; df=4; p-value=.00	$\chi^2=15.6$ ; df=4; p-value=.01	$\chi^2=16.9$ ; df=4; p-value=.01	$\chi^2=20.3$ ; df=4; p-value=.00	$\chi^2=3.04$ ; df=4; p-value=.56	$\chi^2=20.4$ ; df=4; p-value=.00	$\chi^2=3.13$ ; df=4; p-value=.54	$\chi^2=22.0$ ; df=4; p-value=.00	$\chi^2=10.8$ ; df=4; p-value=.05	$\chi^2=21.4$ ; df=4; p-value=.00	$\chi^2=2.73$ ; df=4; p-value=.61

\* Standard errors for percentage figures are in parentheses.

\*\* The "other" category includes American Indian, Alaskan native, Asian, and Pacific Islander.

Note: All percentages are among adolescents who had received information on the topic.

of applying information can be a predictor of the subsequent nutrition behavior (Ajzen and Fishbein, 1980; Mullen, Hersey, and Iverson, 1987). To the extent that this is the case, these responses can provide an indicator of the effectiveness of WIC nutrition education in different areas. **Tables H.25 through H.35** (in **Appendix H**) show, by race and language, how likely adolescents who reported learning something new indicated they were to use nutrition information.<sup>11</sup> The percentages who were “very likely” to use the new information are summarized in **Table 3.29**.

**Table 3.29 WIC Adolescents Who Reported Being “Very Likely” To Use Nutrition Education Information, By Topic**

<u>Topic</u>	<u>All WIC Adolescents</u>
1. Breastfeeding	58.0%
2. Bottle feeding	58.2%
3. Feeding solid foods	66.6%
4. How to use WIC foods	57.7%
5. Getting the most food for your money	60.2%
6. Teaching your child healthy eating habits	68.6%
7. Weight gain during pregnancy	61.1%
8. Effects of smoking on health	54.7%
9. Starting your baby on whole milk	71.9%
10. Substances to avoid while pregnant	64.8%
11. Eating healthy during pregnancy	61.5%

*Note:* Percentages are among adolescents who reported learning something new on a topic. Order of topic presentation corresponds to questionnaire order and to other tables in this section.

In general, some 60% to 70% of adolescents reported that they were very likely to use the information that they learned from WIC on each of the 11 nutrition topics. This pattern was about the same for all of the race/language groups in **Tables H.25 through H.35**, including Spanish-speaking Hispanic adolescents.

However, as shown in **Table 3.30**, we do find that Spanish-speaking Hispanic adolescents were more likely to be already using the information that they learned from WIC,

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<sup>11</sup> This information was collected only from adolescents who reported learning something new.

**Table 3.30 WIC Adolescents Already Using Information Learned in Nutrition Education, by Topic**

Topic	Race/Language			
	White	Black	Spanish-Speaking Hispanic	English Speaking
1. Breastfeeding	8.6%	6.14%	<b>26.6%</b>	8.4%
2. Bottle feeding	9.8%	16.1%	<b>28.3%</b>	13.6%
3. Feeding solid foods	10.9%	13.0%	<b>39.5%</b>	11.8%
4. How to use WIC foods	13.5%	13.3%	<b>34.4%</b>	10.7%
5. Getting the most food for your money	15.0%	11.9%	<b>18.2%</b>	9.5%
6. Teaching your child healthy eating habits	7.5%	8.7%	<b>22.4%</b>	9.2%
7. Weight gain during pregnancy	13.7%	8.5%	<b>25.2%</b>	11.1%
8. Effects of smoking on health	16.7%	11.0%	<b>36.7%</b>	10.6%
9. Starting your baby on whole milk	2.7%	8.6%	<b>30.5%</b>	10.8%
10. Substances to avoid while pregnant	16.7%	10.9%	<b>34.9%</b>	11.0%
11. Eating healthy during pregnancy	13.7%	11.8%	<b>20.9%</b>	13.3%

Note: Percentages are among adolescents who reported learning something new on a topic.  
Order of topic presentation corresponds to questionnaire order and to other tables in this section.

across all 11 nutrition topics, than the remaining race/language groups. The interpretation of this result depends on when respondents started engaging in the behavior. If respondents engaged in a behavior already, then the response simply means that nutrition education helped to reinforce what they were already doing. However, if respondents started the new behavior following the receipt of nutrition education counseling (but prior to the survey), then this response can be an indication that nutrition education influenced behavior. It is not possible, given in a one time survey, to know which of these interpretations applies. Nonetheless, to the extent that the second interpretation is correct (i.e., respondents adopted the behavior following a nutrition education session), this could mean that Spanish-speaking Hispanic adolescents are more likely to adopt the nutrition information that they receive from WIC than the other race/language groups.

**Perceptions of WIC Clinic Directors.** Finally, in **Table 3.31**, we compare clinic director’s beliefs about whether or not adolescents use nutrition information with the percentage of adolescents who would like to receive nutrition information (among adolescents who had not previously received information on the topic). First, we see that nearly a third (31.2%) of clinic directors believe that few adolescents use information on breastfeeding.

**Table 3.31: Interest In and Use of Information Learned About Various Nutrition Education Topics:  
Comparison of Clinic Directors' Perceptions and Adolescents' Reporting**

Nutrition Education Topics	Percent of Adolescents Who Would Like to Receive Information	Clinic Directors' Perceptions As To The Proportion of Adolescents Who Use Information Delivered by WIC on Various Nutrition Education Topics				
		<i>Yes</i>	<i>Most Teens</i>	<i>Some Teens</i>	<i>Few Teens</i>	<i>Don't Cover This Topic</i>
Eating Healthy During Pregnancy	63.7% (2.4%)	26.1% (4.2%)	69.3% (4.4%)	4.5% (1.4%)	.10% (.11%)	100%
How To Use and Prepare WIC Foods	55.3% (6.1%)	19.9% (3.4%)	62.2% (4.6%)	11.4% (2.7%)	6.5% (1.7%)	100%
Breastfeeding	45.7% (3.4%)	14.8% (3.4%)	54.0% (5.3%)	31.2% (5.4%)	0.0% (0.0%)	100%
Bottle-feeding	60.3% (2.5%)	56.3% (5.6%)	37.3% (5.6%)	3.9% (2.2%)	2.6% (1.0%)	100%
Feeding Infants Solid Foods	74.2% (2.5%)	56.1% (5.6%)	48.7% (5.6%)	5.2% (1.6%)	1.0% (0.0%)	100%
How to Teach Children Healthy Eating Habits	74.6% (2.9%)	16.4% (3.2%)	69.9% (4.3%)	13.0% (3.2%)	.7% (.6%)	100%
How to Get the Most Food for Your Money	74.7% (2.3%)	10.6% (2.8%)	50.9% (5.3%)	30% (4.8%)	8.5% (2.0%)	100%
Importance of Weight Gain During Pregnancy	58.4% (2.8%)	18.4% (3.2%)	70.3% (4.2%)	11.1% (2.9%)	.1% (.1%)	100%

\* Standard errors for percentage figures are in parentheses. \*\* Row percentages may not total to exactly 100% due to rounding.

Note: Adolescent percentages are among those adolescents who had not previously received information on the topic.

Note: The clinic director estimates are the percentages of directors and are not weighted by clinic participation. The purpose here is to compare clinic directors' perceptions of how adolescents behave with the reported behavior of adolescents.

Breastfeeding was also one of the lowest desired topics by adolescents, with only 45.7% wanting to receive such information. Also, while a large majority of adolescents indicated that they would like to receive information on how to teach their children healthy eating habits and how to get the most food for their money (74.6% and 74.7%, respectively), very few clinic directors believe that most adolescents will use this information (16.4% and 10.6%, respectively). Furthermore, 30% of clinic directors believe that few teens will use information on how to get the most food for their money.

### **Nutrition Education Methods**

In addition to asking about nutrition education topics, we also gathered information from WIC adolescents about the way in which they received and would like to receive nutrition information. We asked about the experience and preference of WIC adolescents for the setting of their WIC nutrition education sessions, including:

- Individual education sessions
- Group education sessions with all ages
- Group education sessions just for adolescents.

These questions were only asked of adolescents attending their second or later WIC clinic visit.

**Type of Nutrition Education Received.** Both individual education and group sessions with all ages were attended by over two-thirds of adolescents, while 38.1% attended group sessions just for adolescents (**Table 3.32**).<sup>12</sup>

**Preferences for Method of Nutrition Education.** **Table 3.33** shows that just over 50% of adolescents indicated that they prefer individual education sessions, while 28% preferred group sessions just for adolescents.

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<sup>12</sup> These categories are not mutually exclusive since an adolescent could have attended more than one type of nutrition education session.

**Table 3.32**  
**Type of Nutrition Education Received by Adolescents at WIC Clinics,**  
**By Race/Language of Adolescent**

Race/Language	Type of Nutrition Education Received at WIC		
	<i>Individual Nutrition Education</i>	<i>Group Education With All Ages</i>	<i>Group Education With Adolescents</i>
White	73.6%* (4.2%)	61.3% (6.2%)	29.7% (4.3%)
Black	67.4% (3.1%)	66.8% (5.4%)	43.0% (4.1%)
Spanish Speaking Hispanic	53.4% (6.3%)	72.3% (4.3%)	48.3% (4.0%)
English Speaking Hispanic	64.6% (5.0%)	81% (2.6%)	44.3% (3.5%)
Other**	62.0% (3.1%)	75.3% (4.4%)	42.1% (3.3%)
Total	67.8% (2.7%)	68.4% (3.7%)	38.1% (2.6%)
Statistics	$\chi^2=6.6$ ; df=4;p-value=.18	$\chi^2=10.4$ ; df=4;p-value=.05	$\chi^2=13.6$ ; df=4;p-value=.02
<p>* Standard errors for percentage figures are in parentheses.  ** The "other" category includes American Indian, Alaskan native, Asian, and Pacific Islander.  Note: Excludes adolescent attending their first WIC clinic visit.</p>			



**Table 3.33  
Nutrition Education Delivery Methods Preferred by Adolescents, By Race/Language**

<b>Race/Language</b>	<b>Type of Group Nutrition Education Session Preferred</b>				<b>Total**</b>
	<i>Individual Nutrition Education</i>	<i>Group Education With All Ages</i>	<i>Group Education with Adolescents</i>	<i>Don't Like Nutrition Education</i>	
White	56.1%* (4.5%)	7.3% (1.6%)	22.1% (4.1%)	14.5% (2.8%)	100%
Black	53.2% (4.8%)	7.5% (1.8%)	31.2% (3.6%)	8.1% (2.0%)	100%
Spanish Speaking Hispanic	32.4% (3.7%)	35.4% (3.7%)	29.3% (2.6%)	2.9% (1.2%)	100%
English Speaking Hispanic	47.6% (3.5%)	15.6% (2.6%)	31.7% (3.2%)	5.1% (1.4%)	100%
Other***	43.6% (4.0%)	18.5% (2.5%)	36.2% (3.8%)	1.7% (1.9%)	100%
Total	50.8% (3.0%)	12.1% (1.3%)	28.0% (2.3%)	9.1% (1.6%)	100%

\* Standard errors for percentage figures are in parentheses.

\*\* Row percentages may not total to exactly 100% due to rounding.

\*\*\* The "other" category includes American Indian, Alaskan native, Asian, and Pacific Islander.

Note:  $X^2=38.4$ ;  $df= 12$ ;  $p-value=.00$

Note: Excludes adolescents attending their first WIC clinic visit.

**Perceived Effectiveness of Different Methods of Nutrition Education. Table 3.34** compares the type of activities in which adolescents would like to participate with the opinion of WIC clinic directors concerning the effectiveness of the activity. The five type of activities considered, along with the rank order or preference among adolescents vs. clinic directors, were:

<u>Order of Presentation</u>	Rank Order Of:	
	<u>Adolescents' Preferences</u>	<u>Clinic Director's Preferences</u>
Group sessions with discussion among adolescents	3	5
Group activities using games	4	3
Group sessions with video or multimedia resources	2	4
Group demonstrations, such as cooking classes	1	1
Group field trips to the store	5	2

This comparison is instructive because nutrition education activities are effective if adolescents are willing to attend. In some areas, adolescents expressed willingness to participate in activities that clinic directors perceived as effective.

Over two-thirds of adolescents said that they would take part in group demonstrations (such as cooking classes), and 64.8% of clinic directors thought that demonstrations were a very effective education activity. Similarly, regarding sessions with videos and multimedia presentations, 59.5% of adolescents said they would attend such sessions, but only 27.7% of directors reported that this was a very effective activity. Also, 57.2% of adolescents indicated that they would take part in group discussions with other adolescents, but only 15.6% of clinic directors thought that this was a very effective activity, and 23.1% thought it was not effective. Only 38.9% of clinic directors thought that group activities using games were a very effective nutrition education activity, with 46.4% of adolescents indicating that they would participate in this type of activity. Finally, less than half (44.6%) of the adolescents indicated an interest in group field trips to the grocery store; however, the clinic directors seemed divided as to whether or not this was a particularly effective activity. This data seems to suggest that there may be value in increasing the educational quality of popular group or interactive activities in order to improve their value as an educational tool.

**Table 3.34**  
**Effectiveness of Nutrition Education Methods:**  
**Comparison of Clinic Directors' Perceptions and Adolescents' Reporting**

<b>Nutrition Education Method</b>	<b>Adolescents Report That They Would Take Part In Various Types of Nutrition Education</b>			<b>Clinic Directors' Opinions Regarding the Effectiveness of Various Nutrition Education Methods</b>			
	<i>Yes</i>	<i>No</i>	<i>Total</i>	<i>Very Effective</i>	<i>Somewhat Effective</i>	<i>Not Effective</i>	<i>Total</i>
Group Sessions With Discussion Among Adolescents	57.2% (2.8%)*	42.8% (2.8%)	100%	15.6% (4.0%)	61.3% (5.9%)	23.1% (5.9%)	100%
Group Activities Using Games	46.4% (5.1%)	53.6% (5.1%)	100%	38.9% (5.6%)	48.3% (6.1%)	12.8% (3.4%)	100%
Group Sessions With Video or Multimedia Resources	59.5% (3.8%)	40.1% (3.8%)	100%	27.7% (4.8%)	60.8% (5.4%)	11.6% (3.4%)	100%
Group Demonstrations, Such As Cooking Classes	68.5% (3.5%)	31.5% (3.5%)	100%	64.8% (6.3%)	27.1% (5.9%)	8.1% (3.9%)	100%
Group Field Trips to the Grocery Store	44.6% (5.4%)	55.4% (5.4%)	100%	43.3% (6.3%)	41.4% (6.5%)	15.3% (4.7%)	100%

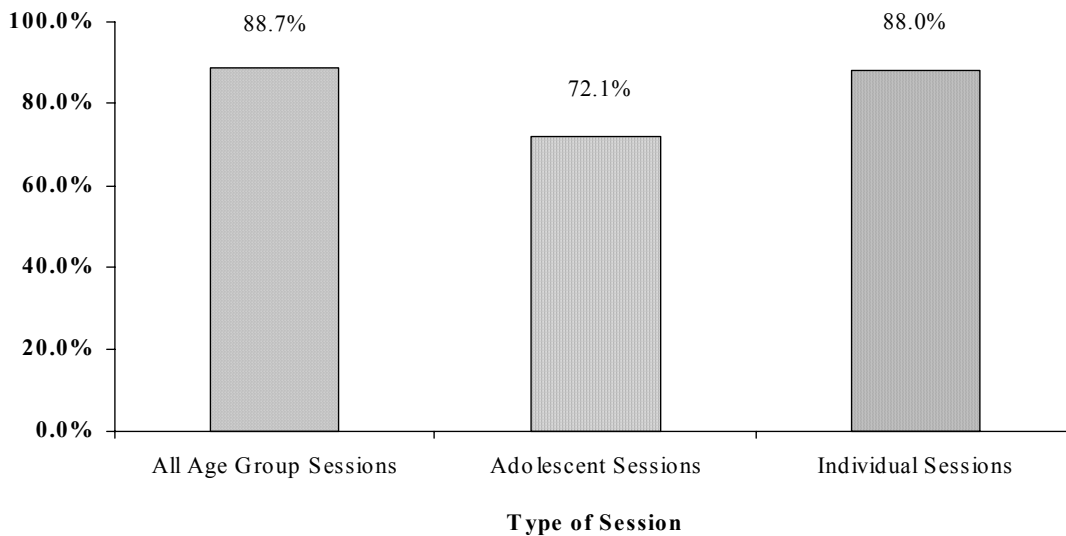
\* Standard errors for percentage figures are in parentheses.

\*\* Row percentages may not total to exactly 100% due to rounding.

Note: The clinic director estimates are the percentages of directors and are not weighted by clinic participation. The purpose here is to compare clinic directors' perceptions of how adolescents behave with the reported behavior of adolescents.

Adolescents were also asked to report if they learned anything new while attending either group sessions, adolescent-only sessions, or individual sessions. These data are presented in **Tables 3.35** through **3.39** by race/language and number of times that the adolescent had visited the WIC clinic. These estimates are among the 1,665 respondents, an estimated 106,537 adolescents, who had attended 2 or more WIC clinic visits. A summary is given in **Figure 3.7**, which shows that adolescents report that they actually were more likely to learn something new in an individual session or in all age group sessions than they were in adolescent-only sessions; 88.0% of respondents reported that they learned something new at individual sessions and 88.7% at all age group sessions compared to only 72.1% of respondents in sessions with other adolescents.

**Figure 3.7 Percentage of Adolescents Learning Something New at Different Types of Nutrition Education Sessions**



**Table 3.35**  
**Percentage of Adolescents Attending Group Nutrition Education Sessions That Report They Learned New Information, by Race/Language of Adolescent**

Race/Language	Learn Anything New During Nutrition Education		Total**
	Yes	No	
White	85.4%* (3.0%)	14.6% (3.0%)	100%
Black	83.3% (3.0%)	16.7% (3.0%)	100%
Spanish Speaking Hispanic	99.6% (0.3%)	0.4% (0.3%)	100%
English Speaking Hispanic	93.7% (1.1%)	6.3% (1.1%)	100%
Other***	92.3% (7.0%)	7.7% (6.9%)	100%
Total	88.7% (1.8%)	11.3% (1.8%)	100%

\* Standard errors for percentage figures are in parentheses.

\*\* Row percentages may not total to exactly 100% due to rounding.

\*\*\* The "other" category includes American Indian, Alaskan native, Asian, and Pacific Islander.

Note:  $X^2=19.1$ ;  $df=4$ ;  $p\text{-value}=.00$

Note: Excludes adolescents attending their first WIC clinic visit.

**Table 3.36**  
**Percentage of Adolescents Attending Group Nutrition Education Sessions**  
**That Report They Learned New Information, by Number of Times Attending WIC Clinic**

Number of Times Been at WIC Clinic	Learn Anything New During Nutrition Education		Total**
	Yes	No	
Once	NA NA	NA NA	NA
Twice	81.1%* (4.0%)	18.9% (4.0%)	100%
Three times	89.5% (3.6%)	10.5% (3.6%)	100%
Four or more times	91.3% (1.9%)	8.7% (1.9%)	100%
Total	89.2% (1.8%)	10.8% (1.8%)	100%

\* Standard errors for percentage figures are in parentheses.

\*\* Row percentages may not total to exactly 100% due to rounding.

Note:  $X^2=4.8$ ;  $df=2$ ;  $p\text{-value}=.11$

Note: Excludes adolescents attending their first WIC clinic visit.

**Table 3.37**  
**Percentage of Adolescents Attending Special Adolescent Nutrition Education Sessions That Report They**  
**Learned New Information, by Race/Language of Adolescent**

Race/Language	Learn Anything New At Teen Nutrition Ed.		Total**
	<i>Yes</i>	<i>No</i>	
White	65.7%* (6.8%)	34.3% (6.8%)	100%
Black	69.0% (4.1%)	31% (4.1%)	100%
Spanish Speaking Hispanic	92.5% (3.3%)	7.5% (3.3%)	100%
English Speaking Hispanic	68.3% (4.7%)	31.7% (4.7%)	100%
Other***	84.9% (11.9%)	15.1% (11.9%)	100%
Total	72.1% (4.0%)	27.9% (4.0%)	100%

\* Standard errors for percentage figures are in parentheses.

\*\* Row percentages may not total to exactly 100% due to rounding.

\*\*\* The "other" category includes American Indian, Alaskan native, Asian, and Pacific Islander.

Note:  $X^2=13.0$ ;  $df=4$ ;  $p\text{-value}=.02$

Note: Excludes adolescents attending their first WIC clinic visit.

**Table 3.38**  
**Percentage of Adolescents Attending One-On-One Nutrition Education Sessions**  
**That Report They Learned New Information, by Race/Language of Adolescent**

Race/Language	Learn Anything New During One-On-One Nutrition Education Session		Total**
	Yes	No	
White	86.4%* (3.0%)	13.6% (3.0%)	100%
Black	87.3% (2.9%)	12.7% (2.9%)	100%
Spanish Speaking Hispanic	96.3% (2.0%)	3.7% (2.0%)	100%
English Speaking Hispanic	90.3% (1.8%)	9.7% (1.8%)	100%
Other***	88.3% (9.3%)	11.7% (9.3%)	100%
Total	88.0% (2.0%)	12.0% (2.0%)	100%

\* Standard errors for percentage figures are in parentheses.

\*\* Row percentages may not total to exactly 100% due to rounding.

\*\*\* The "other" category includes American Indian, Alaskan native, Asian, and Pacific Islander.

Note:  $X^2=5.7$ ;  $df=1$ ;  $p\text{-value}=.02$

Note: Excludes adolescents attending their first WIC clinic visit.



**Table 3.39**  
**Percentage of Adolescents Attending One-On-One Nutrition Education Sessions**  
**That Report They Learned New Information,**  
**by Number of Times Attending WIC Clinic**

Number of Times Been at WIC Clinic	Learn Anything New During One-on-One		Total**
	Yes	No	
Once	NA NA	NA NA	NA
Twice	80.4%* (4.6%)	19.7% (4.6%)	100%
Three times	83.3% (4.3%)	16.74% (4.3%)	100%
Four or more times	92.6% (1.6%)	7.4% (1.6%)	100%
Total	88.0% (2.0%)	12.0% (2.0%)	100%

\* Standard errors for percentage figures are in parentheses.

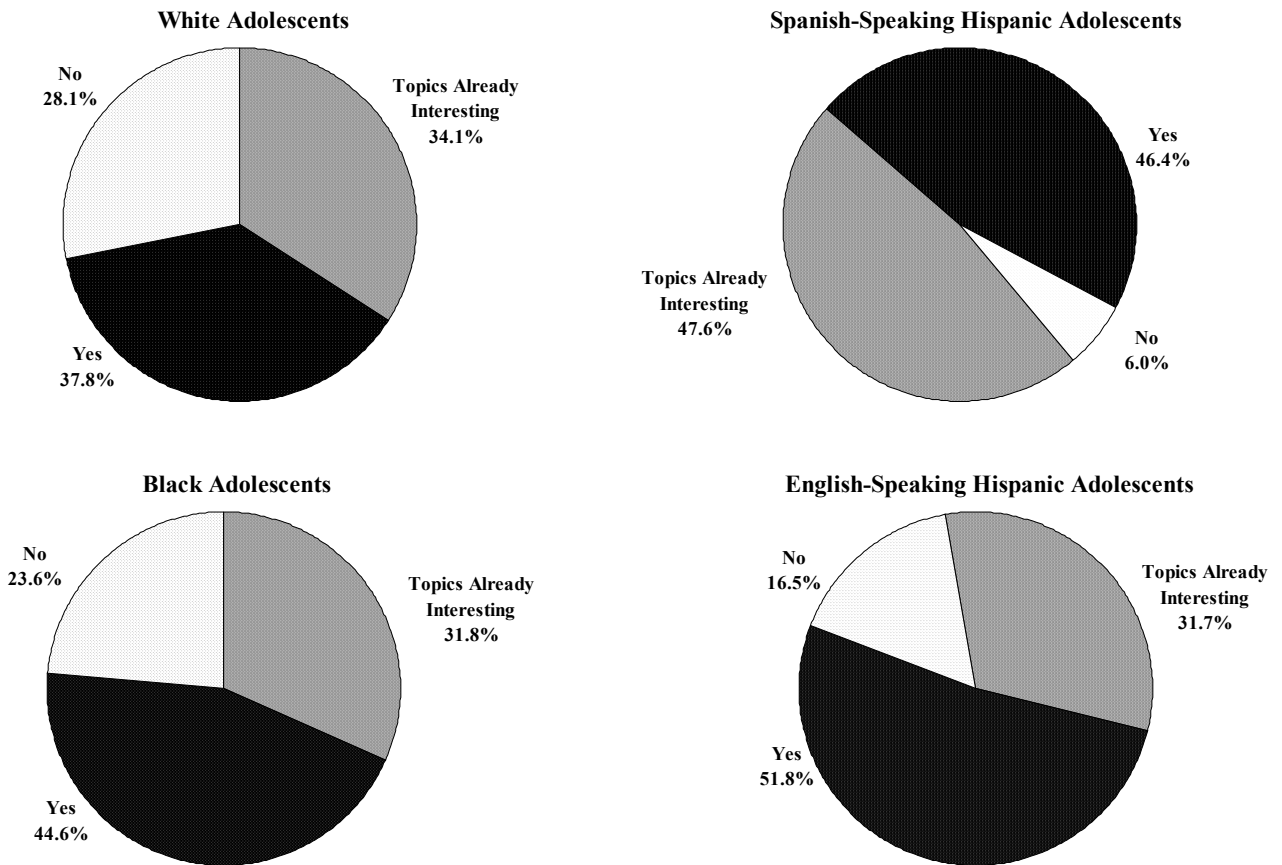
\*\* Row percentages may not total to exactly 100% due to rounding.

Note:  $X^2=10.6$ ;  $df=2$ ;  $p\text{-value}=.01$

Note: Excludes adolescents attending their first WIC clinic visit.

**Willingness to Spend More Time in Nutrition Education.** Adolescents also were asked if they would spend more time at the WIC clinic if nutrition education topics were made more interesting. As reported in **Table 3.40**, for all WIC adolescents, 21.2% indicated that they would not spend more time at the clinic, 43.2% would spend more time, while 35.6% thought that the topics were already interesting. In **Figure 3.8**, as was seen before, Spanish-speaking Hispanic adolescents tended to respond differently than the other groups, with only 6.0% indicating that they would not spend more time at the clinic if the topics were more interesting, and 47.6% reporting that the topics were already interesting.

**Figure 3.8 Percentage of Pregnant Adolescents Willing to Spend More Time at the WIC Clinic if Nutrition Education Topics Were More Interesting**



**Table 3.40**  
**Extent to Which Adolescents Would Spend More Time at the WIC Clinic If**  
**Nutrition Education Topics Were More Interesting, By Race/Language of Adolescent**

Race/Language	More Time At WIC If Topics Interesting			Total**
	Yes	No	<i>WIC Topics Already Interesting</i>	
White	38.5%* (4.9%)	26.8% (5.6%)	34.7% (3.5%)	100%
Black	44.6% (2.9%)	23.6% (3.8%)	31.8% (2.5%)	100%
Spanish Speaking Hispanic	46.4% (4.4%)	6.0% (1.7%)	47.6% (5.2%)	100%
English Speaking Hispanic	51.8% (2.4%)	16.5% (1.5%)	31.7% (2.1%)	100%
Other***	39.8% (2.8%)	9.9% (6.9%)	50.4% (6.7%)	100%
Total	43.2% (2.4%)	21.2% (3.0%)	35.6% (2.2%)	100%

\* Standard errors for percentage figures are in parentheses.

\*\* Row percentages may not total to exactly 100% due to rounding.

\*\*\* The "other" category includes American Indian, Alaskan native, Asian, and Pacific Islander.

Note:  $X^2=18.8$ ;  $df=8$ ;  $p\text{-value}=.04$

## Adolescent Perceptions about WIC Nutrition Education

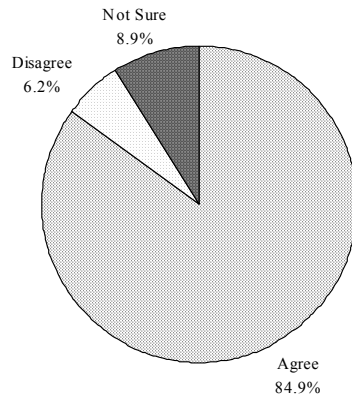
Finally, adolescents were asked about their perceptions of the usefulness of WIC nutrition education. Adolescents were asked to agree or disagree with the following statements:

- WIC teaches the adolescent a lot about nutrition
- WIC provides the nutrition education for the adolescent to be healthy
- WIC provides the nutrition education to have a healthy baby
- WIC has improved the eating habits of the adolescent since enrollment
- My baby is healthier than he/she would be without the WIC food package.

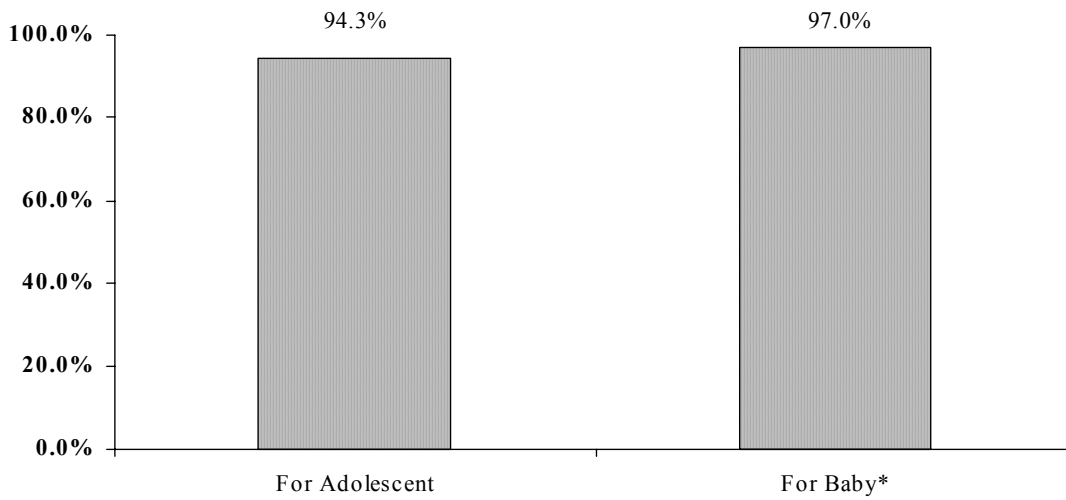
Detailed tabulations for each of these questions, by race and language, are given in **Tables H.19** through **H.23 (Appendix H)**. The essential information from these tables is presented in the text that follows.

**Figure 3.9** presents the distribution of adolescents who agree, disagree or are not sure that WIC teaches them a lot about nutrition. The vast majority of adolescents, 84.9%, do believe that WIC teaches them a lot about nutrition. **Figure 3.10** shows that nearly all WIC adolescents believe that WIC provides the nutrition education needed for either the adolescent or her baby to be healthy (94.3% and 97.0%, respectively). Next, **Figure 3.11** shows that 93.8% of all Spanish-speaking Hispanic adolescents believe their eating habits have improved since enrolling in WIC. However, the remaining major race/ethnicity groups report a much lower percentage, ranging from 72.2% to 79.7%. Finally, **Figure 3.12** shows that 70.9% of parenting adolescents believe that their babies are healthier because of the WIC food package.

**Figure 3.9** Percentage of Adolescents Reporting that WIC Teaches Them a Lot About Nutrition

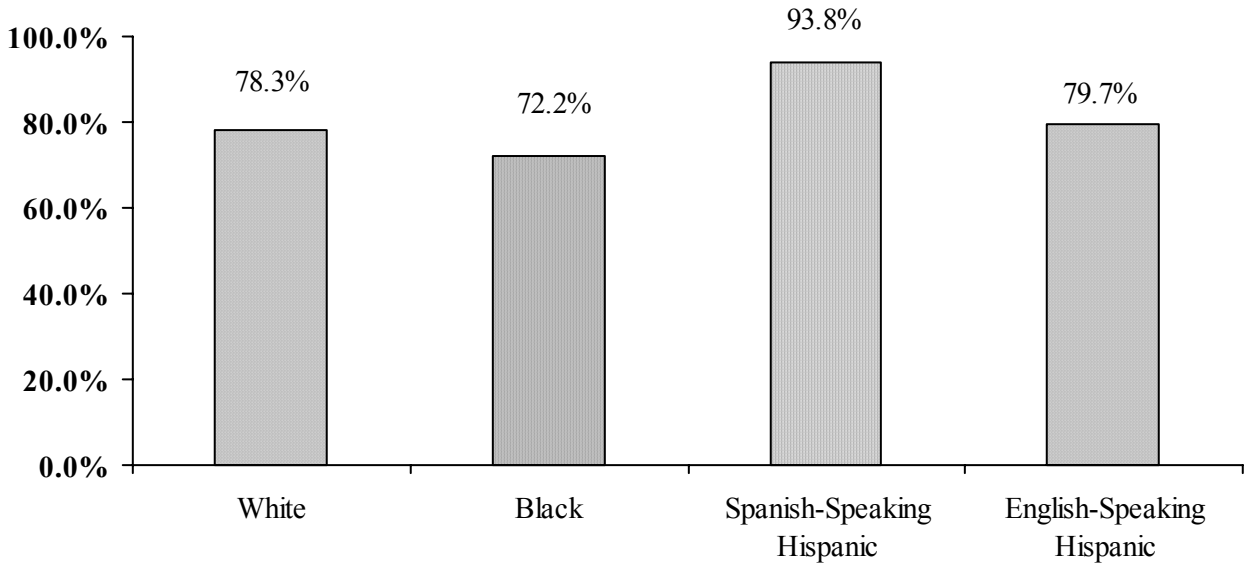


**Figure 3.10** Percentage of Adolescents Believing that WIC Provides Nutrition Education Needed to be Healthy

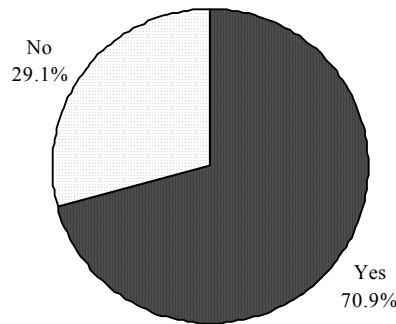


*\* Among parenting adolescents*

**Figure 3.11 Percentage of Adolescents Reporting that Their Eating Habits have Improved Since Enrolling in WIC**



**Figure 3.12 Percentage of Parenting Adolescents Believing Their Baby is Healthier Than He/She Would be Without the WIC Food Package**



One other result seems to corroborate these findings. In its analysis of responses to the question, “Did you learn something new during nutrition education provided in a group setting?”, the study group compared the answers of WIC adolescents who had been three or more times to the WIC clinic (and so were apt to have participated in at least two nutrition education sessions) with the responses of WIC adolescents who had only made two visits to the WIC clinic (and so were likely to have only participated in one nutrition education session). The

study group found that 90% of adolescents who had been to the WIC clinic three or more times reported that they had learned something new during nutrition education sessions, compared to only 81% of WIC adolescents who had attend WIC clinic only twice (please refer back to **Table 3.36**). It is also possible, however, that these differences may be associated with differences in the background of adolescents, because the adolescents who had participated in three or more sessions were more likely to have had their babies and received education for postpartum and feeding.

These findings are consistent with findings from the WIC Nutrition Education Assessment Study (Fox et al., 1999) that conducted a longitudinal study of pregnant WIC participants in six local WIC agencies in three states. That study found significant gains in knowledge in WIC participants between enrollment and a follow-up survey during the last month of a woman's pregnancy; these gains persisted through a follow-up survey at four-to-six months postpartum. The knowledge gains were greatest in the areas of breastfeeding and recommended infant feeding practices. Participants reported being satisfied with WIC education. All six study sites reported significantly increased consumption of milk, 100% fruit juice and WIC cereals between baseline and the prenatal sites. Because the study was conducted with all WIC participants, and not just WIC adolescents, those findings are not comparable to those in the present report. Nevertheless, they are consistent.

### **3.5 The WIC Food Package**

*WIC adolescents generally report that they or their children actually use each of the WIC food items they receive. Despite the fact that WIC is designed as a supplemental nutrition program, adolescents frequently desired to receive greater quantities of WIC foods, particularly juice, cereal, cheese, milk and infant formula. Cultural background influenced food preferences. For instance, Hispanic adolescents more frequently reported asking for more beans and more eggs than did non-Hispanic adolescents.*

#### **Study Issues**

The most direct benefit of the WIC Program is the distribution of supplemental food prescriptions to nutritionally at-risk participants. In order for the WIC food package to be of benefit to the adolescents, it must be acceptable to them and used. In the following section, we explore what foods different racial/ethnic subgroups actually use. This is contrasted with the perceptions of WIC clinic directors about what foods adolescents like to eat. Finally, we

consider the perceptions of adolescents, by race/ethnicity, concerning the adequacies of the amounts of different foods in the WIC food package.

The WIC Program allows for adjustment of the WIC food package. Currently, 97.7% of WIC state agencies make adjustments to improve administrative efficiency of the program. In 1996, such adjustments include designating or disallowing particular brands of food (engaged in by 78.4% of state WIC agencies), designating a specific size of a food container (83.0% of state WIC agencies), or indicating a specific form of food within a food group (75.0% of state WIC agencies). Other state WIC agencies eliminate certain types of foods (34.1% of state WIC agencies) or add special foods (22.7% of state WIC agencies). WIC Programs also tailor programs to the specific nutritional needs of participants, such as specifying reduced fat milk or cheese or adjusting the food package to the food allergies of individual participants.

### **WIC Food Items Consumed**

**Table 3.41** presents the percentages of adolescents who report that they or their children actually eat each WIC food item, among those receiving the item,<sup>13</sup> for each of the following:

Juice	Beans
Cereal	Tuna
Cheese	Peanut Butter
Milk	Carrots
Eggs	Infant Formula

Adolescents were first asked “for each of the foods listed on the following screens, please tell us if you or your child get it in your WIC food package?” Those adolescents reporting receiving a particular food item were then asked, “For each of the WIC foods listed, please indicate whether or not you or your child eat this food each month. Answer Yes if you eat even a little of the food each month. Answer No if you do not eat any of the food during the month.”

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<sup>13</sup> Because each percentage is among those receiving the food item, the estimates are appropriate for the type of food package received by each category of WIC participant (such as pregnant, breastfeeding, or postpartum).



**Table 3.41**  
**Percentage of Adolescents that Actually Use Items in the WIC Food Package, By Race**

Race	WIC Food Package Items									
	<i>Milk</i>	<i>Peanut Butter</i>	<i>Beans</i>	<i>Formula</i>	<i>Eggs</i>	<i>Cereal</i>	<i>Cheese</i>	<i>Juice</i>	<i>Carrots</i>	<i>Tuna</i>
White	95.1%* (1.9%)	90.0% (2.9%)	66.9% (6.6%)	99.6% (.3%)	95.1% (1.1%)	96.0% (1.6%)	96.7% (1.2%)	98.0% (.8%)	85.4% (12.1%)	58.3% (16.9%)
Black	93.9% (1.4%)	79.8% (2.3%)	76.9% (3.7%)	93.2% (2.9%)	93.1% (1.3%)	97.2% (1.2%)	96.9% (.7%)	97.4% (1.2%)	99.2% (1.1%)	98.5% (1.9%)
Hispanic	97.7% (.7%)	82.3% (2.6%)	94.5% (1.3%)	96.4% (1.4%)	95.9% (.7%)	95.9% (1.3%)	95.9% (.9%)	99.1% (.3%)	97.7% (2.1%)	98.4% (1.7%)
Other**	97.8% (2.0%)	95.6% (2.0%)	71.6% (4.3%)	99.9% (.2%)	95.5% (3.3%)	97.4% (2.3%)	56.3% (14.1%)	98.0% (1.9%)	50.0% (0.0%)	100.0% (0.0%)
Total	95.7% (.9%)	85.7% (1.7%)	77.5% (3.1%)	97.1% (.8%)	94.8% (.7%)	96.4% (.8%)	93.9% (2.3%)	98.1% (.5%)	92.9% (5.1%)	83.9% (7.8%)
Statistics	$\chi^2=7.8$ ; df=3; p-value=.07	$\chi^2=14.4$ ; df=3; p-value=.01	$\chi^2=29.6$ ; df=3; p-value=.00	$\chi^2=10.6$ ; df=3; p-value=.02	$\chi^2=3.2$ ; df=3; p-value=.37	$\chi^2=1.6$ ; df=3; p-value=.66	$\chi^2=1.8$ ; df=3; p-value=.63	$\chi^2=5.2$ ; df=3; p-value=.17	$\chi^2=2.2$ ; df=3; p-value=.55	$\chi^2=4.8$ ; df=3; p-value=.21

\* Standard errors for percentage figures are in parentheses.

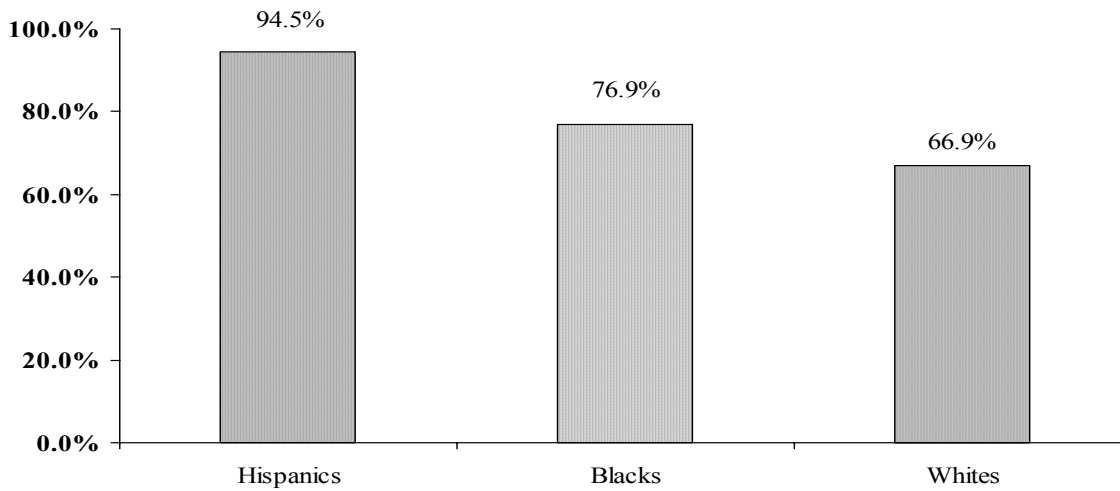
\*\*The "other" category includes American Indian, Alaskan native, Asian, and Pacific Islander.

Note: All percentages are among adolescents who reporting receiving each food item.

In general, the food items are used by a high percentage of the adolescents receiving each food item by all race/ethnicity groups, usually over 90%.

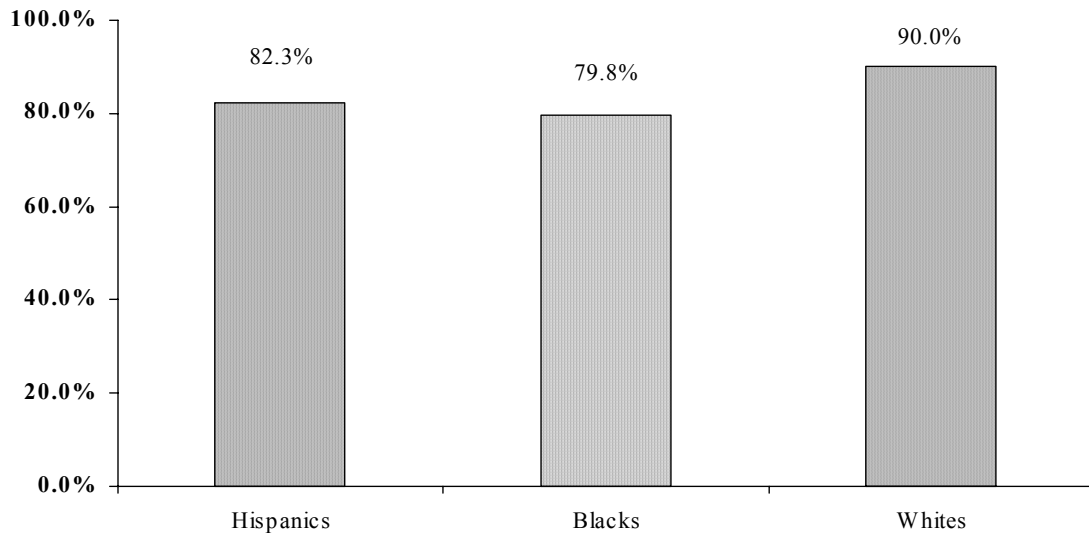
Two interesting exceptions to this pattern occur for beans and peanut butter. For beans, 94.5% of Hispanic adolescents report eating beans, compared to only 66.9% of white adolescents and 76.9% of black adolescents (see **Figure 3.13**).

**Figure 3.13** Proportion of Hispanic, Black, and White WIC Adolescents Eating Beans



On the other hand, 90.0% of white adolescents report eating peanut butter, compared to only 79.8% of black and 82.3% of Hispanic adolescents (see **Figure 3.14**). It is probable that cultural preferences are at the root of these two different food use patterns.

**Figure 3.14 Proportion of Hispanic, Black, and White WIC Adolescents Eating Peanut Butter**



### **Perceptions on Quantities of WIC Foods**

The study group also looked at the perceptions of adolescents concerning the adequacy of the amount of WIC foods provided. In interpreting these findings, it needs to be remembered that WIC is designed to be a supplemental nutrition program, rather than a program to provide all of the mother's or child's nutritional needs. Nonetheless, many of the WIC adolescents appeared to respond to this question as if they wanted the WIC Program to provide all of a particular type of food that was needed. Still, their perceptions help provide useful feedback for planning WIC food packages.

**Quantities in the Entire WIC Food Package.** We started with a global question for the entire food package. The majority of all adolescents (83.1%) believed that the total WIC food package provided the appropriate amount of food (**Table 3.42**).

**Table 3.42**  
**Percentage of Adolescents Who Believe WIC Provides**  
**the Right Amount of Food, By Race**

Race	WIC Provides Appropriate Amount of Food		Total**
	Yes	No	
White	82.7%* (2.4%)	17.3% (2.4%)	100%
Black	74.6% (3.8%)	25.4% (3.8%)	100%
Hispanic	88.1% (1.3%)	11.9% (1.3%)	100%
Other***	94.2% (4.5%)	5.8% (4.5%)	100%
Total	83.1% (1.6%)	16.9% (1.6%)	100%

\* Standard errors for percentage figures are in parentheses.

\*\* Row percentages may not total to exactly 100% due to rounding.

\*\*\* The "other" category includes American Indian, Alaskan native, Asian, and Pacific Islander.

Note:  $X^2=16.6$ ;  $df=3$ ;  $p\text{-value}=.00$

**Quantities of Specific WIC Food Items.** Table 3.43 presents the adolescents’ responses, for each WIC food item, when asked if they could use more, got the right amount, or got too much of the item. Further detail is given in Tables 3.44 through 3.53 where the responses for each food item are shown separately by race. These questions were asked only of adolescents who received each food item from WIC. Thus, the estimates are appropriate for the type of food packages received by each category of WIC participants.

**Table 3.43 Proportion of WIC Adolescent Using WIC Foods and Reporting that WIC Provides the Right Amount of Foods**

Type of Food Item*	Using WIC Food Item		Believing that WIC Provides the Right Amount of Foods					
	Percent	s. e.	Could Use More		Right Amount		Too Much	
			Percent	s. e.	Percent	s. e.	Percent	s. e.
Juice	98.1%	(0.5%)	45.9%	(2.5%)	50.3%	(2.3%)	3.8%	(1.1%)
Cereal	96.4%	(0.8%)	29.1%	(2.4%)	65.0%	(2.7%)	5.8%	(1.2%)
Cheese	93.9%	(2.3%)	27.8%	(2.0%)	67.5%	(2.2%)	4.7%	(1.4%)
Milk	95.7%	(0.9%)	25.3%	(2.1%)	68.6%	(1.6%)	6.1%	(1.2%)
Eggs	94.8%	(0.7%)	21.0%	(1.5%)	73.6%	(2.2%)	5.4%	(1.8%)
Beans	77.5%	(3.1%)	19.7%	(2.7%)	63.3%	(4.0%)	17.0%	(3.7%)
Peanut Butter	85.7%	(1.7%)	13.0%	(2.2%)	74.9%	(2.6%)	12.2%	(1.8%)
Tuna**	83.9%	(7.8%)	18.0%	(7.5%)	75.3%	(10.5%)	6.8%	(6.1%)
Carrots**	92.9%	(5.1%)	9.3%	(4.8%)	74.6%	(6.2%)	16.1%	(8.3%)
Infant Formula	97.1%	(0.8%)	58.4%	(2.5%)	39.8%	(2.3%)	1.8%	(0.9%)

\*These questions were asked only of adolescents who received each food item. Thus, the estimates are appropriate for the type of food package received by each category of WIC participant (such as pregnant, breastfeeding, or postpartum).

\*\*Carrots and tuna were provided exclusively to breastfeeding WIC women only.

The results for each food item, listed in descending order in terms of the preferences of WIC adolescents for more of the item, are:

**Juice.** Nearly equal percentages of adolescents reported that they “could use more” and are receiving the “right amount” of juice (45.9% and 50.3%, respectively). (Table 3.44)

**Table 3.44**  
**Percentage of Adolescents That Believe WIC Provides**  
**the Right Amount of Juice, By Race**

<b>Race</b>	<b>WIC Provides Right Amount- Juice</b>			<b>Total**</b>
	<i>Need More</i>	<i>Right Amount</i>	<i>Too Much</i>	
White	41.2%* (3.6%)	51.6% (4.0%)	7.1% (2.4%)	100%
Black	45.2% (3.6%)	52.8% (3.4%)	2.0% (.8%)	100%
Hispanic	45.9% (2.7%)	52.7% (2.6%)	1.4% (.5%)	100%
Other***	69.8% (7.6%)	30.1% (7.5%)	0.2% (.2%)	100%
Total	45.9% (2.5%)	50.3% (2.3%)	3.8% (1.1%)	100%

\* Standard errors for percentage figures are in parentheses.

\*\* Row percentages may not total to exactly 100% due to rounding.

\*\*\* The "other" category includes American Indian, Alaskan native, Asian, and Pacific Islander.

Note:  $X^2=10.1$ ;  $df=6$ ;  $p\text{-value}=.15$

**Cereal.** 29.1% of adolescents reported that they could use more cereal, while 65.0% reported receiving the right amount; there was little variation by race/ethnicity. (Table 3.45)

**Cheese.** 27.8% of adolescents reported that they could use more cheese, while 67.5% reported receiving the right amount; again, there was little variation by race/ethnicity. (Table 3.46)

**Milk.** 25.3% of all adolescents, and 33.5% of Hispanic adolescents, reported that they could use more milk. (Table 3.47)

**Eggs.** Overall, 21.0% of adolescents thought they could use more eggs. However, 32.5% of Hispanic adolescents reported that they could use more eggs, compared to only 16.2% of white and 13.8% of black adolescents. (Table 3.48)

**Beans.** Over one third (36.2%) of Hispanic adolescents reported they could use more beans, while almost one third (32.5%) of the white adolescents reported receiving too much beans. (Table 3.49)

**Tuna** Most adolescents (75.3%) reported that they received the right amount of tuna. (Table 3.50)

**Peanut Butter.** The majority (74.9%) of all adolescents reported receiving the right amount of peanut butter, with approximately equal percentages reporting they could use more (13.0%) and were receiving too much (12.2%). (Table 3.51)

**Carrots.** Nearly all of the white adolescents (95.1%) reported receiving the right amount of carrots, while 46.5% of black adolescents reported receiving too much, and 19.3% of Hispanic adolescents reported they could use more carrots. (Table 3.52)

**Quantities of Infant Formula.** In addition to the WIC food items listed above, the majority of WIC adolescents using infant formula reported they could use more infant formula (58.4%), with nearly the same percentage of each race/ethnicity group reporting similarly. (Table 3.53)

**Table 3.45**  
**Percentage of Adolescents That Believe WIC Provides**  
**the Right Amount of Cereal, By Race**

Race	WIC Provides Right Amount- Cereal			Total**
	<i>Need More</i>	<i>Right Amount</i>	<i>Too Much</i>	
White	29.4%* (4.1%)	62.9% (4.8%)	7.7% (2.2%)	100%
Black	32.6% (4.6%)	63.0% (4.2%)	4.4% (1.2%)	100%
Hispanic	25.4% (2.3%)	68.9% (2.6%)	5.7% (1.0%)	100%
Other***	29.7% (7.2%)	69.1% (7.9%)	1.2% (1.0%)	100%
Total	29.1% (2.4%)	65.0% (2.7%)	5.8% (1.2%)	100%

\* Standard errors for percentage figures are in parentheses.

\*\* Row percentages may not total to exactly 100% due to rounding.

\*\*\* The "other" category includes American Indian, Alaskan native, Asian, and Pacific Islander.

Note:  $X^2=10.4$ ;  $df=6$ ;  $p\text{-value}=.14$



**Table 3.46**  
**Percentage of Adolescents That Believe WIC Provides**  
**the Right Amount of Cheese, By Race**

<b>Race</b>	<b>Food Amount- Cheese</b>			<b>Total**</b>
	<i>Need More</i>	<i>Right Amount</i>	<i>Too Much</i>	
White	27.7%* (2.5%)	64.8% (2.7%)	7.6% (3.2%)	100%
Black	25.3% (3.3%)	71.4% (3.3%)	3.3% (.9%)	100%
Hispanic	33.8% (1.8%)	63.9% (1.7%)	2.3% (.9%)	100%
Other***	12.3% (8.4%)	86.1% (9.2%)	1.6% (1.3%)	100%
Total	27.8% (2.0%)	67.5% (2.2%)	4.7% (1.4%)	100%

\* Standard errors for percentage figures are in parentheses.

\*\* Row percentages may not total to exactly 100% due to rounding.

\*\*\* The "other" category includes American Indian, Alaskan native, Asian, and Pacific Islander.

Note:  $X^2=11.0$ ;  $df=6$ ;  $p\text{-value}=.12$

**Table 3.47**  
**Percentage of Adolescents That Believe WIC Provides**  
**the Right Amount of Milk, By Race**

<b>Race</b>	<b>WIC Provides Right Amount- Milk</b>			<b>Total**</b>
	<i>Need More</i>	<i>Right Amount</i>	<i>Too Much</i>	
White	26.3%* (2.1%)	67.9% (2.7%)	5.8% (2.1%)	100%
Black	20.0% (2.3%)	74.2% (2.5%)	5.8% (1.0%)	100%
Hispanic	33.5% (2.7%)	63.0% (2.8%)	3.5% (.7%)	100%
Other***	10.8% (7.8%)	73.1% (5.4%)	16.1% (3.2%)	100%
Total	25.3% (2.1%)	68.6% (1.6%)	6.1% (1.2%)	100%

\* Standard errors for percentage figures are in parentheses.

\*\* Row percentages may not total to exactly 100% due to rounding.

\*\*\* The "other" category includes American Indian, Alaskan native, Asian, and Pacific Islander.

Note:  $\chi^2=20.5$ ;  $df=6$ ;  $p\text{-value}=.01$

**Table 3.48**  
**Percentage of Adolescents That Believe WIC Provides**  
**the Right Amount of Eggs, By Race**

<b>Race</b>	<b>WIC Provides Right Amount- Eggs</b>			<b>Total**</b>
	<i>Need More</i>	<i>Right Amount</i>	<i>Too Much</i>	
White	16.2%* (2.3%)	76.6% (3.5%)	7.3% (2.7%)	100%
Black	13.8% (1.7%)	78.2% (5.1%)	8.1% (5.1%)	100%
Hispanic	32.5% (2.8%)	66.1% (2.7%)	1.5% (.8%)	100%
Other***	30.3% (5.4%)	69.0% (5.1%)	.7% (.9%)	100%
Total	21.0% (1.5%)	73.6% (2.2%)	5.4% (1.8%)	100%

\* Standard errors for percentage figures are in parentheses.

\*\* Row percentages may not total to exactly 100% due to rounding.

\*\*\* The "other" category includes American Indian, Alaskan native, Asian, and Pacific Islander.

Note:  $\chi^2=39.8$ ;  $df=6$ ;  $p\text{-value}=.00$

<b>Table 3.49</b>				
<b>Percentage of Adolescents That Believe WIC Provides the Right Amount of Beans, By Race</b>				
<b>Race</b>	<b>WIC Provides Right Amount- Beans</b>			<b>Total**</b>
	<i>Need More</i>	<i>Right Amount</i>	<i>Too Much</i>	
White	7.0%* (2.2%)	60.5% (8.1%)	32.5% (9.0%)	100%
Black	11.1% (3.0%)	74.5% (2.6%)	14.5% (4.0%)	100%
Hispanic	36.2% (2.8%)	62.1% (2.6%)	1.8% (1.1%)	100%
Other***	55.3% (9.5%)	44.3% (9.2%)	0.4% (.5%)	100%
Total	19.7% (2.7%)	63.3% (4.0%)	17.0% (3.7%)	100%

\* Standard errors for percentage figures are in parentheses.  
\*\* Row percentages may not total to exactly 100% due to rounding.  
\*\*\* The "other" category includes American Indian, Alaskan native, Asian, and Pacific Islander.  
Note:  $X^2=49.8$ ;  $df=6$ ;  $p\text{-value}=.00$

**Table 3.50**  
**Percentage of Breastfeeding Adolescents That Believe WIC Provides**  
**the Right Amount of Tuna, By Race**

Race	Food Amount- Tuna			Total**
	<i>Need More</i>	<i>Right Amount</i>	<i>Too Much</i>	
White	17.7%* (11.5%)	65.7% (19.3%)	16.6% (15.9%)	100%
Black	9.3% (10.8%)	89.0% (12.0%)	1.7% (2.1%)	100%
Hispanic	23.4% (12.7%)	75.8% (12.8%)	0.8% (.9%)	100%
Other***	50.0% (0.0%)	50.0% (0.0%)	0.0% (0.0%)	100%
Total	18.0% (7.5%)	75.3% (10.5%)	6.8% (6.1%)	100%

\* Standard errors for percentage figures are in parentheses.

\*\* Row percentages may not total to exactly 100% due to rounding.

\*\*\* The "other" category includes American Indian, Alaskan native, Asian, and Pacific Islander.

Note:  $X^2=7.2$ ;  $df=6$ ;  $p\text{-value}=.33$

**Table 3.51**  
**Percentage of Adolescents That Believe WIC Provides**  
**the Right Amount of Peanut Butter, By Race**

<b>Race</b>	<b>WIC Provides Right Amount- Peanut Butter</b>			<b>Total**</b>
	<i>Need More</i>	<i>Right Amount</i>	<i>Too Much</i>	
White	15.0%* (3.6%)	70.3% (4.6%)	14.7% (3.5%)	100%
Black	10.1% (2.8%)	79.9% (3.0%)	10.0% (2.5%)	100%
Hispanic	10.8% (1.9%)	80.0% (2.5%)	9.2% (1.4%)	100%
Other***	20.8% (9.8%)	64.4% (9.9%)	14.8% (5.8%)	100%
Total	13.0% (2.2%)	74.9% (2.6%)	12.2% (1.8%)	100%

\* Standard errors for percentage figures are in parentheses.

\*\* Row percentages may not total to exactly 100% due to rounding.

\*\*\* The "other" category includes American Indian, Alaskan native, Asian, and Pacific Islander.

Note:  $X^2=11.3$ ;  $df=6$ ;  $p\text{-value}=.11$

**Table 3.52**  
**Percentage of Breastfeeding Adolescents That Believe WIC Provides**  
**the Right Amount of Carrots, By Race**

Race	WIC Provides Right Amount- Carrots			Total**
	<i>Need More</i>	<i>Right Amount</i>	<i>Too Much</i>	
White	0.0%* (0.0%)	95.1% (3.9%)	4.9% (3.9%)	100%
Black	5.2% (6.8%)	48.3% (3.4%)	46.5% (4.2%)	100%
Hispanic	19.3% (12.3%)	74.7% (12.3%)	6.0% (4.0%)	100%
Other***	50.0% (0.0%)	50.0% (0.0%)	0.0% (0.0%)	100%
Total	9.3% (4.8%)	74.6% (6.2%)	16.1% (8.3%)	100%

\* Standard errors for percentage figures are in parentheses.

\*\* Row percentages may not total to exactly 100% due to rounding.

\*\*\* The "other" category includes American Indian, Alaskan native, Asian, and Pacific Islander.

Note:  $X^2=7.9$ ;  $df=6$ ;  $p\text{-value}=.27$

**Table 3.53**  
**Percentage of Adolescents That Believe WIC Provides**  
**the Right Amount of Formula, By Race**

Race	Food Amount- Formula			Total**
	<i>Need More</i>	<i>Right Amount</i>	<i>Too Much</i>	
White	54.8%* (3.9%)	44.6% (3.8%)	0.6% (.3%)	100%
Black	62.6% (5.7%)	35.0% (4.9%)	2.4% (2.3%)	100%
Hispanic	60.7% (4.2%)	37.1% (4.2%)	2.3% (.8%)	100%
Other***	54.3% (4.3%)	42.1% (5.8%)	3.6% (4.1%)	100%
Total	58.4% (2.5%)	39.8% (2.3%)	1.8% (.9%)	100%

\* Standard errors for percentage figures are in parentheses.

\*\* Row percentages may not total to exactly 100% due to rounding.

\*\*\* The "other" category includes American Indian, Alaskan native, Asian, and Pacific Islander.

Note:  $X^2=6.6$ ;  $df=6$ ;  $p\text{-value}=.39$



### 3.6 Referrals for Health Care and Other Services

*One of the important contributions of the WIC Program is timely referral to other services. However, the proportion of adolescents who reported receiving referrals to other programs, such as the Food Stamps Program (41.1%) or to other services such as childhood immunization (54.4%), was considerably lower than the level of referrals reported by WIC clinic directors. Part of this discrepancy may stem from referral practices that rely on providing written information to adolescents. WIC adolescents prefer active referrals in which the WIC staff calls or makes an appointment for them.*

#### Study Issues

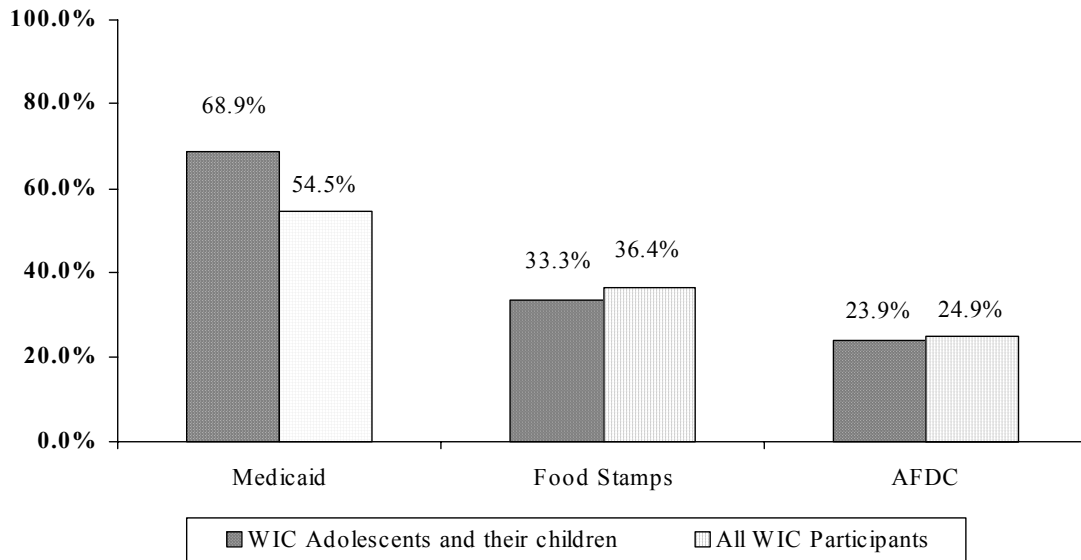
Referrals to other health and public assistance programs is another important benefit of WIC Program participation. WIC may be important to pregnant adolescents because clinics may provide a wide range of comprehensive referral services. These referral services can increase timely access to prenatal and medical care. They can also address the support issues that adolescents may require. Also, because adolescents can have less experience than older WIC participants with social service systems, the WIC Program can often help them with issues such as access, scheduling, and help with application procedures and protocols.

This section reviews the other public programs in which adolescents are participating. It then compares the referrals reported by adolescents to the programs to which clinic directors refer adolescents. Finally, it looks at the methods of referral preferred by adolescents and compares this with the methods that WIC clinic directors report using.

#### Participation in and Referral to Other Programs

**Participation in Other Assistance Programs.** Figure 3.15 shows the percentages of adolescents receiving either Aid to Families with Dependent Children (AFDC)/Temporary

**Figure 3.15 Program Participation of WIC Adolescents and All WIC Participants**



Source: USDA. *Study of WIC Participant and Program Characteristics, 1996*. Exhibit 4.4. 1998.

Assistance to Needy Families (TANF),<sup>14</sup> Medicaid, or Food Stamps. **Table 3.54** shows this information by race/language of the adolescent. Adolescents in this study reported their participation in other programs at the time of their interviews, which might be after WIC certification, while participation in other programs was determined at certification for all WIC participants in PC96, and includes adolescents.

Overall, 23.9% of WIC adolescents reported receiving AFDC. Receiving Medicaid for her child was the most commonly reported type of public assistance (68.9%), while receipt of food stamps was reported by one third of adolescents. Of note is that Spanish-speaking Hispanic adolescents reported participation in these three public assistance programs at much lower rates than the other race/language groups, including English-speaking Hispanic adolescents — 10.6% for AFDC, 53.6% for Medicaid, and 25.7% for Food Stamps.

<sup>14</sup> TANF is the successor to the Aid to Families with Dependent Children (AFDC) program.

**Table 3.54**  
**Percentage of Adolescents Having Received AFDC,**  
**Medicaid, or Food Stamps, By Race/Language**

Race/Language	Type of Assistance Received		
	<i>Ever Received AFDC</i>	<i>Ever Received Medicaid for Child</i>	<i>Ever Received Food Stamps</i>
White	18.3%* (4.3%)	70.7% (4.1%)	31.5% (3.7%)
Black	29.8% (5.1%)	75.1% (3.5%)	34.6% (5.2%)
Spanish Speaking Hispanic	10.6% (3.4%)	53.6% (5.5%)	25.7% (3.5%)
English Speaking Hispanic	22.6% (1.9%)	60.4% (3.2%)	35.7% (3.3%)
Other***	50.1% (7.1%)	74.3% (4.8%)	39.8% (3.2%)
Total	23.9% (2.8%)	68.9% (2.3%)	33.3% (2.4%)
Statistics	$X^2=13.5$ ; df=4; p-value=.02	$X^2=15.1$ ; df=4; p-value=.01	$X^2=11.7$ ; df=4; p-value=.04

\* Standard errors for percentage figures are in parentheses.  
\*\*\* The "other" category includes American Indian, Alaskan native, Asian, and Pacific Islander.

**Referral to the Food Stamp Program.** Regarding referrals made by the WIC Program, the percentages of adolescents who report being referred to the Food Stamp Program (FSP) by WIC are shown in **Table 3.55**.<sup>15</sup> Overall, 41.0% of adolescents reported being referred to the Food Stamp Program. However, Hispanic adolescents reported much lower rates of referral to the Food Stamp Program — 24.2% for Spanish-language and 29.7% for English-language Hispanic adolescents.

**Referrals for Other Services.** In addition, WIC also may provide information, or referrals, concerning creating a safe home environment for a child and about childhood immunizations. In **Table 3.56**, we see that nearly half (45.7%) of parenting (postpartum) adolescents reported receiving information from WIC about creating a safe home environment. About one-half (49.1%) of parenting adolescents reported being provided information about childhood immunizations from the WIC Program (**Table 3.57**).

This can be compared to the programs to which WIC clinic directors reported referring adolescents, by sponsoring agency of the clinic, shown in **Table 3.58**. Over 90% of clinic directors reported that their clinics refer adolescents to the Food Stamp Program, Medicaid, AFDC/TANF, family planning and to childhood immunizations. However, only 38.2% of clinic directors reported referring adolescents to unemployment services. This held true whether the clinic was sponsored by a local government agency, a state agency, or was privately sponsored. The generally high rate of referrals may be a little misleading since clinic directors were only asked to report if their clinics ever referred adolescents to these programs, as opposed to the percent of adolescents for whom such referrals were made.

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<sup>15</sup> Because of the timing of the adolescent interview, it is not possible to determine if the adolescent was already participating in the FSP and, hence, not given a referral, or if the WIC staff had not yet had the opportunity to make such a referral.

**Table 3.55**  
**Percentage of Adolescents Reporting They Received a Referral**  
**To The Food Stamp Program, by Race/Language**

Race/Language	Provided Referral for Food Stamps		Total**
	Yes	No	
White	52.4%* (5.1%)	47.6% (5.1%)	100%
Black	40.3% (6.5%)	59.7% (6.5%)	100%
Spanish Speaking Hispanic	24.2% (3.6%)	75.8% (3.6%)	100%
English Speaking Hispanic	29.7% (2.5%)	70.4% (2.5%)	100%
Other***	25.4% (4.6%)	74.6% (4.6%)	100%
Total	41.0% (3.4%)	59.0% (3.4%)	100%

\* Standard errors for percentage figures are in parentheses.

\*\* Row percentages may not total to exactly 100% due to rounding.

\*\*\* The "other" category includes American Indian, Alaskan native, Asian, and Pacific Islander.

Note:  $X^2=17.2$ ;  $df=4$ ;  $p\text{-value}=.01$

**Table 3.56**  
**Percentage of Postpartum Adolescents Reporting a WIC Referral For Information**  
**on Creating a Safe Home Environment, By Baby's Enrollment Status**

Is Baby Currently Enrolled in WIC	WIC Provided Information About Creating a Safe Home Environment		Total**
	<i>Yes</i>	<i>No</i>	
Yes	46.7%* (5.0%)	53.4% (5.0%)	100%
No	46.4% (15.6%)	53.6% (15.6%)	100%
Not sure, baby just born	19.4% (7.0%)	80.6% (7.0%)	100%
Total	45.7% (4.9%)	54.4% (4.9%)	100%

\* Standard errors for percentage figures are in parentheses.

\*\* Row percentages may not total to exactly 100% due to rounding.

Note:  $X^2=7.0$ ;  $df=2$ ;  $p\text{-value}=.04$

**Table 3.57**  
**Percentage of Postpartum Adolescents Reporting a WIC Referral**  
**For Information on Childhood Immunizations, By Baby's Enrollment Status**

Is Baby Currently Enrolled in WIC	WIC Provided Information About Immunizations		Total**
	Yes	No	
Yes	52.2%* (4.4%)	47.8% (4.4%)	100%
No	28.5% (9.9%)	71.5% (9.9%)	100%
Not sure, baby just born	19.2% (8.1%)	80.8% (8.1%)	100%
Total	49.1% (4.5%)	51.0% (4.5%)	100%

\* Standard errors for percentage figures are in parentheses.  
\*\* Row percentages may not total to exactly 100% due to rounding.  
Note:  $X^2=9.8$ ;  $df=2$ ;  $p\text{-value}=.01$

**Table 3.58**  
**Percentage of Clinic Directors Reporting Referrals of Adolescents to Other Social Service Programs, By Agency Type, For All Clinic Directors**

Type of WIC Sponsoring Agency	Programs For Which Teens are Referred					
	<i>Refer Teens to Food Stamp Program</i>	<i>Refer Teens to Medicaid</i>	<i>Refer Teens to AFDC</i>	<i>Refer Teens to Unemployment</i>	<i>Refer Teens to Family Planning</i>	<i>Refer Teens to Childhood Immunizations</i>
Local government public health department	88.1% (5.4%)*	98.3% (1.0%)	90.8% (4.7%)	37.6% (5.5%)	94.1% (2.1%)	98.2% (1.1%)
Private, non-profit agency	95.8% (2.3%)	99.5% (.48%)	97.5% (1.6%)	36.0% (11.1%)	90.9% (4.2%)	99.8% (.2%)
Local or district health office run by state employers	98.6% (1.4%)	98.6% (1.4%)	98.6% (1.4%)	47.5% (12.4%)	92.8% (3.7%)	96.5% (3.5%)
Total	92.0% (3.1%)	98.8% (.6%)	94.0% (2.7%)	38.2% (5.4%)	92.9% (1.8%)	98.6% (.7%)
Statistics	$\chi^2=3.3$ ; df=2; p-value=.20	$\chi^2=1.3$ ; df=2; p-value=.52	$\chi^2=2.3$ ; df=2; p-value=.32	$\chi^2=.6$ ; df=2; p-value=.76	$\chi^2=.5$ ; df=2; p-value=.76	$\chi^2=2.9$ ; df=2; p-value=.24

\* Standard errors for percentage figures are in parentheses

\*\* Row percentages may not total to exactly 100% due to rounding.

Note: The clinic director estimates are the percentages of directors and are not weighted by clinic participation. The purpose here is to compare clinic directors' perceptions of how adolescents behave with the reported behavior of adolescents.



Part of the reason for the discrepancy between the adolescent and clinic director data on referrals is that WIC clinic directors were asked about referrals made by their clinic, while WIC adolescents were asked about referrals made for them personally. Still, only 13.0% of clinic directors felt adolescents followed through with all the referrals they were given (**Table 3.59**). Hence, efforts to improve referral mechanisms deserve continued attention.

**Preferred Methods of Referral.** Adolescents also were asked about the methods of referral that they most preferred. **Table 3.60** shows that the most preferred method is for appointments to be made by the WIC staff, with nearly half of the adolescents most preferring this method. Spanish-language Hispanic adolescents were even more likely to prefer this method, with 61.2% selecting “appointments made by WIC staff.” About equal percentages of all adolescents most preferred either telephone numbers or brochures provided by WIC staff about (20% each). By far the least preferred method was to have the WIC staff walk the adolescent over to the other program; only 6.0% noted was their most preferred method.<sup>16</sup>

In focus groups, WIC adolescents indicated that they preferred integrated, co-located services. They mentioned that if they had to get services from a different location, they were more likely to “put off” scheduling appointments.<sup>17</sup>

In contrast, WIC clinics often appear to be somewhat more passive in their referral process than adolescents like. The most used method of referral by clinics is written information, with 50.5% of WIC clinics providing written information for all referrals, and 47.4% for some referrals (see **Table 3.61**).

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<sup>16</sup>However, as can be seen in Appendix **Table K.23**, nearly one-half (45.7 percent) of all WIC clinics do not walk adolescents to other services. Thus, most adolescents probably have not had the chance to experience this method of referral.

<sup>17</sup>In contrast, staff in focus groups often mentioned that they preferred freestanding clinics because teens could focus on the WIC component rather than viewing their WIC visit as “one more step in the process.” This suggests that freestanding WIC clinics will need to emphasize methods to facilitate access to other services.

**Table 3.59**  
**Distribution of Clinic Directors' Perceptions As To Whether or Not Adolescents**  
**Follow Through With Referrals Provided to them by the WIC Program**

	<i>Yes, for all referrals</i>	<i>Yes, for some referrals</i>	<i>No</i>	<i>Total**</i>
Most teens follow through with referral	12.7% (3.1%)	78.0% (4.2%)	9.3% (3.2%)	100%

\* Standard errors for percentage figures are in parentheses.

\*\* Row percentages may not total to exactly 100% due to rounding.

Note: The clinic director estimates are the percentages of directors and are not weighted by clinic participation. The purpose here is to compare clinic directors' perceptions of how adolescents behave with the reported behavior of adolescents.

**Table 3.60**  
**Method of Referrals Preferred by Adolescents, by Race/Language**

Race/Language	Method of Referral Most Preferred				Total**
	<i>Appointment Made by WIC Staff</i>	<i>Telephone Number Provided by WIC Staff</i>	<i>Walk Over to Program With WIC Staff</i>	<i>Brochure Provided by WIC Staff</i>	
White	37.4%* (5.4%)	28.5% (4.9%)	7.2% (2.5%)	26.8% (3.3%)	100%
Black	56.5% (4.0%)	20.8% (2.7%)	7.1% (1.5%)	15.6% (2.0%)	100%
Spanish Speaking Hispanic	61.2% (2.7%)	12.4% (2.5%)	3.9% (1.4%)	22.5% (2.9%)	100%
English Speaking Hispanic	54.2% (2.7%)	19.9% (2.4%)	4.0% (1.6%)	21.9% (2.0%)	100%
Other***	69.8% (7.5%)	18.7% (2.8%)	2.9% (2.3%)	8.5% (6.2%)	100%
Total	49.4% (3.4%)	23.2% (2.6%)	6.0% (1.2%)	21.4% (2.2%)	100%

\* Standard errors for percentage figures are in parentheses.

\*\* Row percentages may not total to exactly 100% due to rounding.

\*\*\* The "other" category includes American Indian, Alaskan native, Asian, and Pacific Islander.

Note:  $X^2=30.3$ ;  $df=12$ ;  $p\text{-value}=.01$

**Table 3.61**  
**Distribution of WIC Clinics that Give Teenagers Written Information**  
**About Services, By Type of WIC Sponsoring Agency**

<b>Type of WIC Sponsoring Agency</b>	<b>Give Adolescents Written Information About Services</b>			
	<i>Yes, for all referrals</i>	<i>Yes, for some referrals</i>	<i>No</i>	<i>Total**</i>
Local government public health department	50.6% (5.9%)	47.3% (6.0%)	2.2% (1.2%)	100%
Private, non-profit agency	46.8% (12.0%)	52.0% (12.1%)	1.2% (1.0%)	100%
Local district health office run by state employees	61.0% (11.0%)	35.1% (10.5%)	4.0% (4.0%)	100%
Total	50.5% (5.4%)	47.4% (5.5%)	2.1% (0.9%)	100%

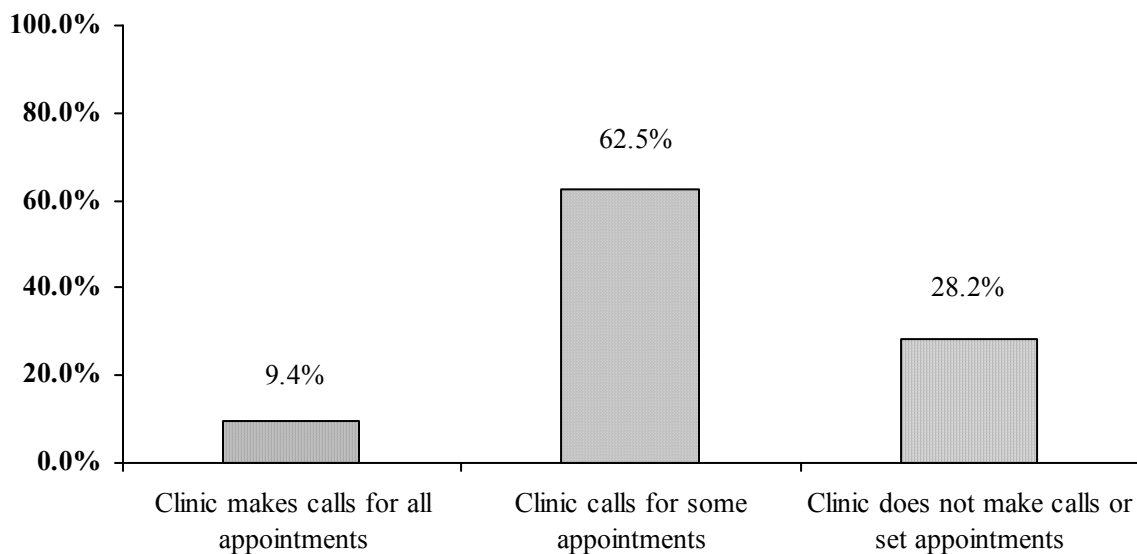
\* Standard errors for percentage figures are in parentheses.

\*\* Row percentages may not total to exactly 100% due to rounding.

Note:  $X^2=1.8$ ;  $df=4$ ;  $p\text{-value}=.78$

Clinics frequently make calls or set appointments for adolescents, but this is not as common as providing written referrals. As **Figure 3.16** shows, while only 9.4% of WIC clinics make calls or set appointments for all referrals, 62.5% of clinics make at least some calls or appointments for adolescents (**Table 3.62** shows the data by type of WIC sponsoring agency). However, 28.2% of WIC clinics reported that they did not make calls or set appointments for adolescents. Given the interest expressed by adolescents in help with the referral process, efforts to improve integration of services by actively making such appointments is a strategy that may deserve greater consideration in the ongoing efforts of WIC Programs to continuously improve their services.

**Figure 3.16 Percentage of WIC Clinics that Make Calls or Appointments for Adolescents at Other Social Service Agencies**



Similarly, the WIC Nutrition Education Assessment Study (Fox et al., 1999), a descriptive study in six local WIC agencies in three states, found that referrals of WIC participants to health and social services were relatively low (although, because referrals are tailored to the individual needs of a participant, the absence of referral does not imply that a referral opportunity was missed.) Moreover, the variability among the six different local

**Table 3.62**  
**Distribution of WIC Clinics that Make Calls or Appointments for Adolescents**  
**at Other Social Service and Health Agencies, by Type of WIC Sponsoring Agency**

Type of WIC Sponsoring Agency	Make Calls or Appointments For Adolescents			
	<i>Yes, for all referrals</i>	<i>Yes, for some referrals</i>	<i>No</i>	<i>Total**</i>
Local government public health department	11.9% (4.2%)	57.0% (6.0%)	31.1% (5.5%)	100%
Private, non-profit agency	5.7% (3.0%)	68.8% (11.0%)	25.5% (10.7%)	100%
Local district health office run by state employees	8.7% (5.6%)	69.0% (10.2%)	22.3% (9.0%)	100%
Total	9.4% (2.6%)	62.5% (5.2%)	28.2% (5.0%)	100%

\* Standard errors for percentage figures are in parentheses.

\*\* Row percentages may not total to exactly 100% due to rounding.

Note:  $X^2=2.3$ ;  $df=4$ ;  $p\text{-value}=.69$

Note: The clinic director estimates are the percentages of directors and are not weighted by clinic participation. The purpose here is to compare clinic directors' perceptions of how adolescents behave with the reported behavior of adolescents.

agencies in the WIC Nutrition Education Assessment Study suggested that patterns of referrals were associated with the contextual variability of the local agencies and the way that participants were involved with needed programs before entry into WIC. Among the six local agencies in the study, a low of 3% and a high of 37% of prenatal respondents, and a low of 7% and a high of 41% of postpartum respondents, reported that they received referrals for services. The most frequent referrals reported in the WIC Nutrition Education Assessment Study were for counseling for smoking, alcohol, or drug use, and for breastfeeding support. The majority of participants who received a referral reported that they followed up on it; self-reported rates of follow-up ranged from 80% for referrals to Medicaid to 32% for counseling for substance use.

## 4. STUDY CONCLUSIONS

*WIC adolescents require special attention from the WIC Program. Adolescents are a developmentally vulnerable population who can greatly benefit from the services that WIC provides. WIC adolescents report using WIC foods and applying what they learn about nutrition education.*

*However, substantial numbers of WIC adolescents fail to enroll in WIC during their first trimester of pregnancy; continued outreach to this population will be important. Because a primary source of information about the WIC Program and about nutrition is an adolescent's family, outreach and education efforts should encompass this broader community audience. WIC's efforts should be sensitive to the cultural background of adolescents.*

*WIC adolescents prefer active referrals in which the WIC clinic staff call or help them to make appointments. To address low rates of follow-through by adolescents, it may help to incorporate ongoing reminders and systems to improve integration with WIC services.*

### 4.1 Themes for Consideration

This is the first study to have gathered information from a national survey of WIC adolescents. As such, the study provides new insight into the needs and perceptions of pregnant adolescents and adolescent mothers enrolled in WIC. This information will help the WIC Program continue to improve its outreach and services. Key findings from the survey were presented in Chapter 3. This chapter discusses more overriding themes for action to help the WIC Program meet the needs of its adolescent participants.

Several overriding themes emerge from this study:

- Continued emphasis should be placed on encouraging timely enrollment.
- Outreach efforts need to be grounded in community awareness.
- WIC should build on the success of its nutrition services.
- WIC should continue to improve systems to improve referrals and integration of services for adolescents.
- WIC outreach and services need to be sensitive to cultural differences of WIC adolescents.



## **Encouraging Timely Enrollment**

Despite the current outreach efforts, a substantial number of WIC adolescents enroll in the WIC Program later than their first trimester of pregnancy. The extent of late enrollment depends on whom one asks; 44% of WIC adolescents reported that they did not enroll in WIC until after their first trimester of pregnancy; 60% of clinic directors report that the majority of WIC adolescents fail to enroll during their first trimester, and PC96 data indicate that 43% of WIC adolescents enroll in WIC after their first trimester of pregnancy. Accordingly, efforts to encourage timely enrollment must continue to receive high priority.

Addressing the barriers to timely enrollment of adolescents will require a concerted effort to address a complex set of challenges. For adolescents, an important barrier to early enrollment may be lack of early awareness that one is pregnant. Addressing this issue may require special sensitivity. WIC wants to convey a message that it is important to participate in WIC early in one's pregnancy. At the same time, however, this message will need to be framed in a way that does not encourage teenage pregnancy.

Other barriers to enrollment include lack of awareness about the need for WIC and reluctance to ask for public assistance. In focus groups, teenagers expressed feelings of embarrassment for enrolling in WIC and viewed WIC as synonymous with welfare. Nonetheless, once enrolled in the program, adolescents tended to feel comfortable "because there's lots of others like us here and the staff is very nice."

Transportation was mentioned as a problem by about a quarter of WIC clinic directors. In focus groups, adolescents talked about WIC clinic hours conflicting with school and work, and some wanted clinics to add evening and weekend hours. However, the general perception of WIC clinic directors was that clinic hours, location, and waiting times did not pose nearly the level of barrier to enrollment as attitudinal barriers.

In some communities there may also be special barriers to access. For instance, in Texas, Hispanic adolescents were sometimes unclear about eligibility requirements for WIC. In

California, a set of focus groups with Southeast Asian immigrants found that these young women did not have a literal translation for the WIC Program in their own language, but referred to it as “the place where you get free infant formula.” Such cultural perceptions may be important for communities to address in outreach efforts.

### **Grounding Outreach in Community Awareness**

The most common source of information about the WIC Program and about nutrition practices are the adolescents’ families. Hence, in planning outreach, it is important to recognize that the major source of information about the WIC Program comes not from flyers or brochures (reported as a primary source of information by only about 1% of adolescents), or even from health professionals or other assistance programs (each mentioned by only 14% of WIC adolescents). Rather, 61% of WIC adolescents first learned about WIC from other family members. Similarly, WIC adolescents most commonly depend on family members for information on a healthy diet. The most important source of nutrition information was their mother or stepmother (mentioned by 42% of adolescents), other relatives (mentioned by 10% of adolescents), or a baby’s father (mentioned by 6% of adolescents). By comparison, only 8% of adolescents reported relying on what they learned in the WIC Program as their primary source of information.

These findings suggest that the WIC Program should continue efforts to get the message about its services to the family members who can convey the value of timely prenatal care and nutrition services to adolescents. Information about healthy diet also needs to be delivered by family members. The WIC Program can supplement these family messages with specific education at a time when a pregnant adolescent may be particularly motivated to learn about a healthy diet. But, dietary practices are strongly based in the patterns and attitudes of an adolescents’ family, and the family attitudes will be important in reinforcing the more tailored messages about health and nutrition that the WIC Program can provide. All this argues strongly that nutrition education can benefit from being a coordinated part of community-based nutrition programs, and that outreach efforts likewise need to utilize and strengthen natural support networks to convey messages about the importance of timely enrollment in the WIC Program.

## **Building on the Success of Nutrition Services Activities**

Once enrolled, adolescents indicate that they like the WIC Program and that they apply what they learn there. Nearly all adolescents report that they or their children use the WIC foods that are provided. Indeed, when asked, they would actually like to receive more of some foods, such as juice and infant formula. There were cultural differences in preferences and utilization. Hispanic adolescents were more likely to use beans, while white adolescents were more likely to use peanut butter.

WIC nutrition education is perceived as useful by adolescents. This is despite concerns, sometimes voiced in focus groups with WIC staff, that the nutritional practices of adolescents are largely influenced by the attitudes of their peers. Indeed, focus groups with adolescents revealed that peer attitudes were important in decisions about breastfeeding. For instance, WIC adolescents told us that they were embarrassed to breastfeed in public or in front of their boyfriends, and without strong peer support, adolescents who tried breastfeeding often soon gave up because of the pain. These reports are consistent with survey findings that adolescents were less interested in receiving information about breastfeeding than other topics.

The situation with dietary practices, however, appears to be different. It is, of course, accurate to observe that the eating habits of adolescents are often influenced by convenience and the eating patterns of their friends and families. For instance, in focus groups, adolescents reported:

We all skip meals often and don't choose healthy food.

It's easier to grab a quick snack at the store than to walk down all the supermarket aisles and choose regular food.

Nonetheless, in contrast to the situation with breastfeeding, adolescents are interested in learning about nutrition to improve the health of their baby. Most adolescents (82%) recognize that what they eat while pregnant affected their baby's health. They expressed interest in

learning how to eat well. Three-quarters of respondents were interested in learning about “getting the most food for your money” and about “teaching their child healthy eating habits.”

Study findings indicate that adolescents are benefiting from WIC nutrition education sessions. Of the adolescents who received information about those topics, a high proportion of adolescents reported that they learned something new about eating healthy during pregnancy (89%), teaching their child healthy eating habits (86%), or getting the most food for their money (81%). Adolescents were more likely to report learning something new from nutrition education if they had attended three or more WIC clinic sessions than if they had only participated in two WIC clinic sessions (90% vs. 81%). In addition, most adolescents reported that they were very likely to use the information they received about these topics; for example, 69% of adolescents reported that they were very likely to use what they learned about teaching their child healthy eating habits.

All this is not meant to imply that there is no reason to improve nutrition education for WIC adolescents. For instance, less than half (46%) of WIC adolescents reported receiving information about getting the most food for their money, while 75% of respondents wanted information on this topic. Hence, this is a topic that might receive greater emphasis.

It also needs to be recognized that WIC nutrition education sessions are limited in duration and frequency. WIC adolescents typically report that their families (rather than the WIC Program) are their principal source of nutrition information. And despite their interest in nutrition education, 21% of adolescents reported that they were unwilling to attend additional nutrition education sessions. In this regard, we note the research studies in WIC settings which demonstrated increases in behavior such as breastfeeding, provided that ongoing support and telephone counseling are components of their activities (Saunders and Carroll, 1988; Contento, 1995). These types of constraints will need to be addressed in the design of efforts to continue to improve nutrition education services to WIC adolescents.

Nonetheless, the fact that 76% of WIC adolescents report that their eating habits have improved since enrolling in WIC is heartening. For example, in focus groups, WIC adolescents spoke of

- Wanting to learn how to cook and prepare foods
- Wanting information on infant feedings and protecting their babies
- Making changes in their own nutrition practices, such as not skipping meals, and introducing nutritious food to their children
- Improving the overall health of their children. One adolescent mother reported: “My son was low in iron, and I learned how to feed him and get his iron back up to normal.”

### **Continuing to Improve Referrals and the Integration of Services**

This study suggests that the WIC Program faces special challenges regarding referral services to health care and other social services for adolescents. For instance, virtually all WIC clinic directors (98%) reported that their clinics provided referrals for childhood immunizations.

However, only a little over half of WIC adolescent mothers (54%) reported that they had received a referral for childhood immunizations. Clinic directors report that adolescents do not always follow through on the referrals they receive: indeed, only 13% of clinic directors thought that most adolescents always followed through.

Adolescents prefer referrals in which the WIC clinic can call or make an appointment for them. This suggests that WIC adolescents may benefit from efforts of WIC staff to provide active referrals, and from initiatives that can provide reminder systems and administrative measures to facilitate integration with other service programs. However, WIC clinic directors report that they often lack the staff resources and systems to offer such active referral services; only 9% of WIC clinics make appointments for all referrals, and 28% of WIC clinics do not make any calls or appointments.

Initiatives to enhance active referral procedures may need to include investment in staff resources and referral systems. In focus groups, WIC clinic staff often mentioned the challenge of delivering integrative referral services in the face of administrative and staff resource constraints. Continued attention to management practices and performance feedback can also

contribute to improvements in referrals. Improving referrals and service integration for adolescents will require sustained attention, but such efforts can be effective. For instance, in Georgia WIC clinics, a team effort by WIC staff and immunization program staff resulted in a dramatic statewide increase over a five year period in the proportion of WIC children who were up-to-date in immunization by 24 months of age, from around 50% to over 90% of all WIC children (Hersey et al., 1996.) Similar examples in other WIC agencies have been found in terms of referrals to prenatal care, social services, and medical care. However, these types of improvements require sustained action and attention. WIC adolescents appear to be a priority group to receive enhanced services.

### **Continuing Sensitivity to Cultural Diversity**

One of the lessons from adolescent WIC participants is that it will be important to respond to the cultural diversity of various populations. For instance, because knowledge of the WIC Program and of nutrition primarily comes from family members, the Program needs to incorporate community-based efforts that convey appropriate nutrition related messages that are clearly understood and culturally acceptable to family members.

The importance of cultural issues can also be seen in the fact that Hispanic adolescents, particularly Hispanic adolescents who used Spanish as a primary language, appeared to benefit greatly from nutrition education. For instance, Spanish-speaking Hispanic adolescents were more likely to report learning something new in WIC nutrition education sessions, and 94% of Spanish-speaking Hispanic adolescents reported that their eating habits had improved since enrolling in WIC (compared to 77% of all WIC adolescents). Hispanic adolescents also expressed a desire for increased quantities of beans in their WIC food allotment. Adapting the WIC Program to meet the needs of special subgroups of adolescents can have important health benefits. Other groups of WIC adolescents are likely to benefit from similar attention to issues of sensitivity.

## 4.2 Conclusion

The WIC Program serves important functions by addressing the needs of adolescents as part of the general population served by WIC. WIC adolescents are a vulnerable population who have been proven medically to particularly benefit from participation in the WIC Program. The WIC adolescents in this survey reported that they used the WIC foods that were provided, that they learned from the nutrition education sessions, and that they were applying what they learned so that their eating habits have improved since enrolling in WIC.

Nonetheless, a substantial number of adolescents fail to enroll in WIC during the first trimester of pregnancy. Thus, continued outreach efforts will be important. Such outreach efforts need to be community based and culturally relevant, since families and friends are a primary source of information about the WIC Program and about nutrition for adolescents.

The WIC Program should continue to improve its efforts to make referrals with other agencies. Adolescents prefer active referral mechanisms in which WIC staff call or help them to make appointments for them. Finally, efforts should continue to improve the cultural sensitivity and relevance of program services to adolescents

## REFERENCES

- Ajzen, I., and Fishbein, M. (1980). *A Theory of Reasoned Action*. Englewood Cliffs, N.J.: Prentice-Hall.
- Armotrading, D.C., Probart, C.K., and Jackson, R.T. (1992). Impact of WIC utilization rate on breastfeeding among international students at a large university. *Journal of the American Dietetic Association*, 92: 352-353.
- Auerbach, K., and Walburn, J. (1987) Nebraska physicians infant feeding recommendations. *Nebraska Journal of Medicine*, 6:289-299.
- Batten, S., Hirschman J., and Thomas, D. (1990). Impact of the special supplemental food program on infants. *Journal of Pediatrics*, 117: S101-109.
- Baydar, N., McCann, M., Williams, R., Vesper, E., McKinney, P. (1997). *WIC Infant Feeding Practices Study*. Prepared for the Office of Analysis and Evaluation, USDA Food and Nutrition Service.
- Berenson, A. (1997). Inadequate weight gain among pregnant adolescents: risk factors and relationships to infant birth weight. *American Journal of Obstetrics and Gynecology*, 153: 273-284.
- Centers for Disease Control and Prevention (1994). Current trends among women who did not receive prenatal care -- United States, 1980 - 1992. *Morbidity and Mortality Weekly Report*, September 23, 1994, 43: 939-942.
- Centers for Disease Control and Prevention (1995). Poverty and Infant Mortality -- United States, 1988. *Morbidity and Mortality Weekly Report*, December 15, 1995, 44: 923-927.
- Centers for Disease Control and Prevention (1997). State-specific birth rates for teenagers -- United States, 1990 - 1996. *Morbidity and Mortality Weekly Report*, September 12, 1997, 46: 837-842.
- Collins, T.R., Leeper, J.D., Milo, T., DeMellier, S. (1984) Perceptions and knowledge of breastfeeding among WIC and non-WIC pregnant women in Alabama. *Alabama Journal of Medical Science*, 21: 145-148.
- Contento, I., et al. (1995) The effectiveness of nutrition education and implications for nutrition policy, programs, and research: A review of research. *Journal of Nutrition Education*, 27: 227-420.
- Cross, A. W. (1992) Material and Child Health. In Last, J. M., and Wallace, R. B. *Public Health and Preventive Medicine*. Norwalk, CT: Appleton and Lange, 995-1004.



- Edozien, J.C., Switzer, B.R., and Bryan, R.B. (1979) Medical evaluation of the Special Supplemental Food Program for Women, Infants, and Children. *American Journal of Clinical Nutrition*, 32, 677-692.
- Food and Nutrition Service, USDA (1998). *Study of WIC Participant and Program Characteristics, 1996*. Alexandria, VA.: USDA.
- Fox, M.K., Burnstein, N., Golay, J., and Price, C. *WIC Nutrition Education Assessment Study: Final Report*. Report to FNS, Abt Associates. 1999.
- Hersey, J.C., B. Pierce, G. Haugen, and K. Mitchell (1996). *Management and Clinic Practices Associated with Immunization Rates in Georgia Public Health Clinics: Final Report* Prepared for the Centers for Disease Control and Prevention (Contract No. 200-93-0626, Task No. 3). Battelle and RTI.
- Institute of Medicine (1985). *Preventing Low Birthweight*. Washington, D.C.: National Academy Press.
- Kennedy, E.T., and Gershoff, S. (1982). Effect of WIC supplemental feeding on hemoglobin and hematocrit of prenatal patients. *Journal of the American Dietetic Association*, 80: 227-230.
- Kotelchuck, M., Schwarz, J.B., Anderka, M.T., and Finison, K.S. (1984) WIC participation and pregnancy outcomes: Massachusetts statewide evaluation project. *American Journal of Public Health*, 74: 1086-1092.
- MacDorman, M.F., and Atkinson, J.O. (1998) *Infant Mortality Statistics from the 1996 Linked Birth/Infant Death Data Set*. Washington, D.C.: National Center for Health Statistics.
- Metcoff, J., Costilow, P., Corsby, E.M., et al. (1985) Effects of food supplementation (WIC) on during pregnancy on birthweight. *American Journal of Clinical Nutrition*, 41: 993-947.
- Mullen, P.D., Hersey, J.C., and Iverson, D.C. (1987). Health behavior models compared. *Social Science and Medicine*, 24: 973-981.
- National Center for Health Statistics. (1997). *Report of Final Natality Statistics, 1995*. Washington, D.C.: National Center for Health Statistics.
- Nestle, M. Nutrition in Public Health and Preventive Medicine. In Last, J. M., and Wallace, R. B. *Public Health and Preventive Medicine*. Norwalk, CT: Appleton and Lange, 1095-1098.
- Office of Technology Assessment (1998). *Healthy Children: Investing in the Future*. Washington, D.C.: U.S. Congress, Office of Technology Assessment.

- Rosander, K., and Sims, L. (1981) Measuring effects of an affective-based nutrition education intervention. *Journal of Nutrition Education*, 13: 1-2-105.
- Rush, D., Horvitz, D.G., Seaver, W.B., et al. (1990) The National WIC Evaluation: *American Journal of Clinical Nutrition*, 48: 389-519.
- Saunders, A., and Carroll, J. (1988). Postpartum breastfeeding support: Impact on duration. *Journal of the American Dietetic Association*, 88: 213-219.
- Schneck, M.E., Sideras, K.S., Fox, RA, Dupuis, L. (1990) Low income pregnant adolescents and their infants: dietary findings and health outcomes. *Journal of the American Dietetic Association*, 90: 555-558.
- Shapiro, S., McCormick, M.C., Starfield, B.H., Krischer, J.P., and Bross, D. (1980). Relevance of correlates of infant deaths to significant morbidity at one year of age. *American Journal of Obstetrics and Gynecology*, 136: 363-373.
- Smith, A.L., Branch, G., Henry, S.E., Magpuri, R. (1986). Effectiveness of a nutrition program for mothers and their anemic children under 5 years of age. *Journal of the American Dietetic Association*, 86:1039-1042.
- Stockbauer, J.W. (1986) Evaluation of the Missouri WIC Program: prenatal component. *Journal of the American Dietetic Association*, 86: 61-67.
- U.S. Public Health Service (1990). *Healthy People 2000: National Health Promotion and Disease Prevention Objectives*. Washington, D.C., Department of Health and Human Services.
- Ventura, S., Martin, J., Curtin, S., and Mathews, T.J. (1998). *Report of Final Natality Statistics, 1996*. Washington, D.C.: National Center for Health Statistics.