

**The Determinants of WIC Participation
in Madison and Herkimer Counties, NY**

by

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I. Introduction

The mission of the Special Supplemental Nutrition Program for Women, Infants, and Children (WIC) is to safeguard the health of low-income women, infants, and children up to age 5 who are at nutritional risk by providing nutritious foods to supplement diets, information on healthy eating, and referrals to health care. The purpose of this paper is to examine the determinants of participation in the WIC program in Madison and Herkimer Counties. Currently, the WIC participation rate – the percentage of eligible families who participate - in these counties is only approximately 60%. Determining why some eligible families do not participate in WIC will help the local WIC office to better target consumers and, hopefully, increase participation.

II. Background on WIC

A. Overview

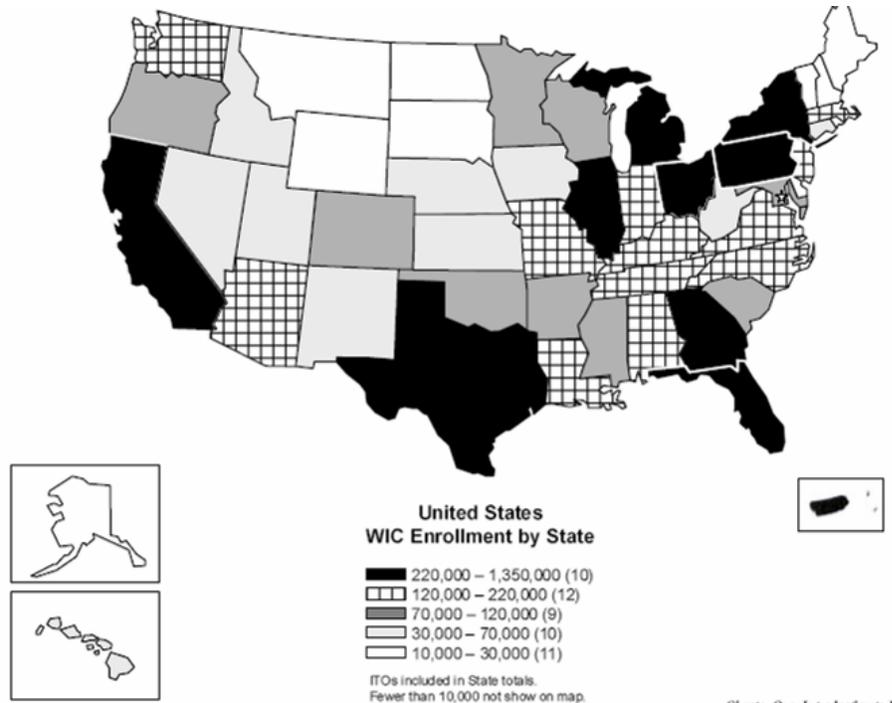
The Special Supplemental Nutrition Program for Women, Infants, and Children program (WIC) is designed to provide adequate food, nutrition counseling, access to health services, and nutritional education to low-income women, infants, and children. WIC is a federal program, administered by the Food and Nutrition Service of the US Department of Agriculture (USDA). Federal grants are supplied to states to distribute to participants for supplemental foods, health care referrals, and nutrition education.

WIC started in 1972 as a pilot program and was made permanent in 1974, but not as an entitlement program. Each year, Congress authorizes a certain amount of funding to be given to the program, which is then distributed to state agencies. State funding levels are primarily based on the projected number of participants in each state. The formula takes into consideration food costs and inflation. Other issues concern

differential salaries and the number of high at-risk participants. Food grants are allocated through a formula based on caseload, inflation, and poverty indices. The federal agency also takes into account how much was given to the state last year and the estimated number of income-eligible infants and children.

There are 55 WIC state agencies (one in each of the 50 states, the District of Columbia, American Samoa, the Commonwealth of Puerto Rico, Guam, and the US Virgin Islands) and 33 Indian tribal organizations that receive federal funds. State agencies keep part of the federal funds, and administer the remaining aid to the 2,200 local agencies and 9,000 clinic sites. Figure 1 shows WIC enrollment rates by state. The map shows that only 10 states have more than 220,000 participants, with around the same number having less than 30,000 participants.

Figure 1:



Federal funds are appropriated into two categories: direct costs that include costs that can be identified directly with WIC-related programs (such as salaries for staff who provide breastfeeding counseling) and indirect costs that cover costs for activities that are not easily linked to WIC (such as salaries for staff providing accounting for both WIC and non-WIC programs). For the 55 state agencies, about 91% of federal funds were used for direct cost expenditures (GAO). Nonfederal funds may also be used. Table 1 shows which states receive funds from the state government. Many state and local agencies provided funding for nutrition services. These contributions are often in the form of facilities and maintenance.

Table 1:

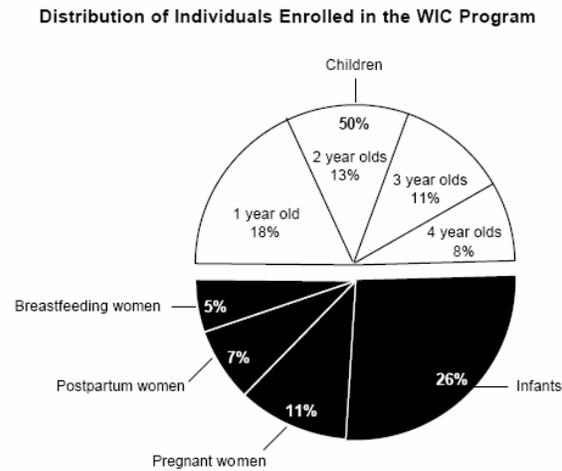
State-level WIC agency	Amount of federal WIC nutrition services and administration grant ^a	Amount of additional funds provided by state government	Total federal and state government funds	Percent of nutrition services and administration funds provided by state government
District of Columbia	\$3,006,398	\$440,000	\$3,446,398	12.77
Massachusetts	16,612,979	9,844,185	26,457,164	37.21
Maryland	13,265,219	200,000	13,465,219	1.49
Minnesota	13,688,076	3,176,502	16,864,578	18.84
New Mexico	7,334,574	1,313,000	8,647,574	15.18
New York	70,998,409	20,070,487	91,068,896	22.04
Rhode Island ^b	3,626,256	65,000	3,691,256	1.76
Tennessee	20,486,157	855,184	21,341,341	4.01
Vermont	2,634,707	90,903	2,725,770	3.33
Washington	21,510,227	1,993,062	23,503,289	8.48
West Virginia ^b	9,299,104	15,000	9,314,104	0.16
Total	\$182,462,106	\$38,063,323	\$220,525,589	17.26

^a Fiscal year 1998 WIC grant amount reported by state-level WIC agency.

^b Fiscal year 1998 expenditures did not exceed the amount of the federal WIC grant.

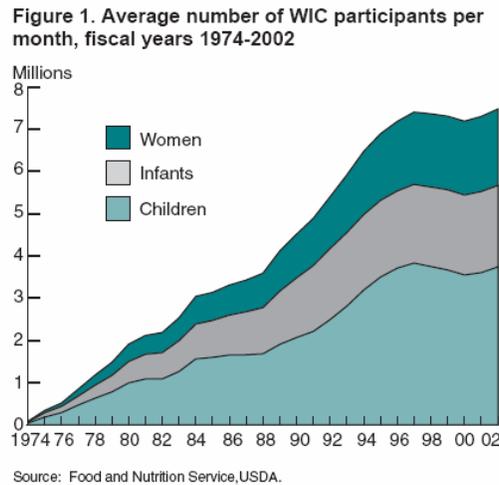
Source: GAO's survey of state-level WIC agencies.

WIC benefits go to more than 7.5 million people each month, (3.82 million children, 1.95 million infants, and 1.86 million women). Figure 2 shows that approximately half of all participants are children between ages 1 and 4.

Figure 2:

Source: USDA WIC Participation and Program Characteristics 2000

Figure 3 shows that WIC participation rates among all three groups have increased steadily since 1972, with only a slight decline in the early 90's. The USDA WIC Participation and Program Characteristics 2000 reports that between 1992 and 1994, enrollment in WIC increased by 20 percent; between 1994 and 1996, enrollment increased another 12 percent. Between 1996 and 1998, the rate of increase (3.8 percent) was much lower than in previous years. WIC enrollment declined slightly between 1998 and 2000, falling by approximately 2 percent.

Figure 3

B. Eligibility

In order to be eligible for the WIC program, the participants must meet four criteria: categorical, residential, income, and nutrition risk.

Categorical Requirements: Pregnant, postpartum (up to 6 months after the birth) and breastfeeding (up to the infant's first birthday) women are eligible for the program. Infants up to the age of one and children up to the age of five are also eligible.

Residential Requirements: Applicants must live in the state in which they apply. You may also be required to live within a local service area to receive benefits at a local agency.

Income Requirements: Applicants must have income at or below an income level or standard set by the State agency or be determined automatically income-eligible based on participation in certain programs. The participant must fall at or below 185% of the poverty level. If a person is eligible to receive food stamps, Medicaid, TANF (Temporary Assistance for Needy Families), they automatically

meet the income eligibility requirement for WIC. Table 2 provides an overview of the income guidelines.

Table 2:

WIC Income Eligibility Guidelines (Effective from July 1, 2004 to June 30, 2005)					
48 Contiguous States, D.C., Guam and Territories					
Household Size	Annually	Monthly	Twice-Monthly	Bi-Weekly	Weekly
1	17,224	1,436	718	663	332
2	23,107	1,926	963	889	445
3	28,990	2,416	1,208	1,115	558
4	34,873	2,907	1,454	1,342	671
5	40,756	3,397	1,699	1,568	784
6	46,639	3,887	1,944	1,794	897
7	52,522	4,377	2,189	2,021	1,011
8	58,405	4,868	2,434	2,247	1,124
Each add'l member, add	+5,883	+491	+246	+227	+114

Nutrition Risk Requirements: Participants must visit a health professional who will determine if they are indeed at nutritional risk. This can be done right at the WIC clinics with no cost to the applicant. WIC recognizes two categories of “nutrition risk: medically-based risks such as anemia, underweight, overweight, history of pregnancy complications, or poor pregnancy outcomes, and dietary risks, such as failure to meet the dietary guidelines or inappropriate nutrition practices” (Nutrition Program Facts). It is uncommon for a participant to be denied entry in the program due to this factor, since the guidelines are relatively loose. In fact, there is a USDA proposal to remove the dietary questionnaire since almost all applicants lack in at least one dietary guideline. The Madison County WIC office has never turned away an applicant due to this factor.

Meeting all of these requirements does not entitle you to the benefits of the program; there must also be sufficient funds available. Since WIC is not an entitlement program, the state or local agency may not have enough funding to allow all eligible individuals to join. If the individual cannot be accepted into the program due to lack of funds, they will be placed on the waiting list. WIC uses a priority system to determine who on the waiting list will receive benefits first. This system is in place to make sure that those who are at the highest risk are serviced first. Those first on the waiting list are pregnant women, breastfeeding women and children with serious medical problems, followed by children who are at a nutrition risk because of a medical problem and those with dietary problems. However, in recent years, there has been enough federal and state funding to provide benefits to all that are eligible.

C. Procedure for Applying

The first step in applying for WIC is to contact your state or local WIC agency and schedule an appointment. WIC staff provide the participant with a list of the appropriate information to bring to the appointment to determine eligibility. This list includes proof of income, ID, proof of address, and a birth certificate and shot record for each child. Once arriving at the office, the applicant meets with a nutrition assistant who checks proof of income, proof of residency and identification. They must then wait to meet with the nutritionist who goes over their diet and health history. The nutritionist weighs and measures the infants and children. If the infant is over six months, a blood test for hemoglobin levels is taken. (If the infant is determined to be at risk because of the blood test, they must come back every 6 months: if not, they can wait a year.) Pregnant and postpartum mothers are also weighed and measured. The nutritionist also

checks the participant's iron levels if she is pregnant and discuss healthy eating for two. The nutritionist and applicant then go over the food packages that the client is eligible for and, together, they choose one. The participant receives her first checks immediately. This process takes approximately one hour.

D. How WIC Works

Each state administers food vouchers for participants (referred to as checks) to supplement their diet. Food vouchers are worth \$150 a month for infants, \$60 for pregnant women, \$80 for breastfeeding women, \$45 for non-breastfeeding women, and about \$55 for children ages one to four (State of NY WIC). Vouchers in New York State are given for a 3-month period, although each month's voucher is clearly marked. They can be used at authorized food stores. 46,000 food stores nationwide accept WIC vouchers. Each state authorizes food stores to participate and accept these food vouchers. The store accepts the voucher for the food. The cashier must separate WIC foods and tally up the total. The participant then signs the check and the store sends it to Key Bank in Albany (for NY State WIC). Key Bank then reimburses the store. When authorizing a store, the state considers the prices of food, the business integrity of the store, and the variety and the quantity available. A store that does not have high volume (25 checks a month) will be taken off the WIC program unless there is not another store with a 30-mile radius. Locally, in Herkimer and Madison Counties, most stores are relatively accessible for participants, although some clients report that the way they are treated in the stores is a large barrier to continuing with the program.

Different food packages are provided for different categories of participants. Non-breastfed infants are provided with formula. Children's food packages include milk,

vitamin-C rich juice, iron-fortified cereal, and eggs. All infants are given cereal at 4 months and juice at 6 months. At one year old, whole cow's milk is provided (some can be received in the form of cheese). At two years old, WIC recommends that children switch to 1% or skim milk. Pregnant women receive milk, eggs, iron-fortified cereal, juice, and peanut butter, dry beans or peas. Breastfeeding mothers are also provided with tuna and carrots.

The length of time that a participant is in the program usually ranges from 6 months to one year, depending on whether the participant is a woman, infant, or child. For example, pregnant women are eligible for their entire period of pregnancy and six weeks post-partum. Infants are certified until they reach one year. Finally, children are certified for six months at a time. When a participant returns to WIC to get recertified, the parent must participate in nutrition counseling.

WIC foods are highly regulated and must be rich in one or more of the following nutrients: protein, calcium, iron, vitamin A, and vitamin C. These nutrients are often missing in the diets of WIC participants. Eligible foods include:

- Cereal: hot or cold
 - Adult varieties: corn flakes, bran flakes, oatmeal
 - Infant varieties: any plain, dry cereal (rice, barley, grain)
- Adult and Infant Juice: any 100% fruit or vegetable juice
- Milk
 - Fluid, cultured buttermilk, evaporated, or dry
- Cheese
- Eggs
- Dried Beans/Peas/Peanut Butter
- Carrots
- Tuna
- Infant Formula
 - Concentrated liquid, powdered, or ready-to-feed
 - Special therapeutic infant formulas can be provided

WIC provides a special infant formula rebate system. Mothers participating in WIC are encouraged to breastfeed their infants, but WIC still provides formula vouchers. State agencies are required by law to competitively bid out the infant formula contract. By doing this, states agencies are able to provide formula to more participants.

Nutrition education is an important part of the WIC program. Each time a participant comes to the WIC office, whether it is to get recertified or pick up checks, she must participate in some sort of nutrition program. In NY, a peer counseling program is being started, where WIC participants are trained by the WIC staff and then lead a client group. The education program is catered to the individual and is based on nutritional needs, household situations, and cultural preferences. The programs are targeted at women as well as children. However, participants are not required to attend these educational sessions to receive the food vouchers.

WIC has also established the Nutrition Services Standards to help them monitor their role in the community and improve their services. These “standards” are intended to provide WIC state and local agencies with a tool to:

- Inspire the revitalization of quality nutrition services
- Identify Federal requirements
- Assess the delivery of quality nutrition services to participants
- Determine staff training, technical assistance and resource needs

The WIC program also includes the Farmers’ Market Nutrition Program (FMNP), with a goal to provide unprepared, locally grown fresh fruits and vegetables to WIC participants. All those who have been certified to participate in WIC and those who are on the waiting list to participate are eligible for this program. Over 2 million people participated in 2003. Participants are given coupons (in addition to the coupons they regularly receive through WIC) to buy the freshly prepared fruits, vegetables, and herbs

directly from farmers or at farmers' markets. The federal coupon level can be no less than \$10 and no more than \$20 per family per year, but the state can also match these funds. The coupon is given to the FMNP participant, who then uses it to buy the food. The farmers then submit the coupons for reimbursement.

Another WIC sponsored program is "Eat Well Play Hard," which is designed to combat obesity and to prevent children from becoming overweight. This program targets preschool age children. The programs goals are to increase developmentally appropriate physical activity among children, to increase the consumption of 1% and skim milk and low fat dairy products beginning at age two, and to increase the consumption of fruits and vegetables. This program is specific to New York State.

WIC also works closely with migrant families. Special procedures for migrant families exist to ensure their participation in the program. A Verification of Certification (VOC) form is used to make sure that even as migrant families move around the country, they continue to receive the full benefits of the WIC program. In fact, migrancy is considered a nutritional risk factor. Agencies are required to provide information in several languages to make sure this risk group is targeted.

WIC also places an emphasis on immunizations. WIC's role is to find out if their child clients have received immunizations. If they have not, they will provide the family with information on how and where the child can get immunized.

E. New York State WIC

State agencies have considerable autonomy. Although they have to follow certain federal guidelines, they have great flexibility in adjusting services to meet their clients' needs. New York State's WIC agency was founded in 1978 and works to develop

program regulations that support, strengthen, and enhance the WIC program and its service to low-income families in New York. The New York State WIC is concerned with receiving adequate funding from the government, as well as making sure this funding is used to maximize benefits to participants. Another goal of the NYS WIC is to encourage support for this program from different federal and state organization. In NYS, there are 465,000 low-income women, infants and children who benefit from this program in 99 local agencies. They serve the third largest WIC population at 6.44% (behind California and Texas with 17.22% and 10.51% respectively) (USDA Participant and Program Characteristics, 2000). The state agency publishes a monthly edition of WIC-WISE, which provides local agencies and participants with brief news bits that highlight the program.

New York State has one of the highest state-provided funding levels, with 22 percent of its total funds (totaling \$20 million) coming from nonfederal sources. Only eleven of the 55 WIC state agencies receive state funding. This additional state funding has provided a lot to the program. In fiscal year 1998, New York received \$70,998,409 from the federal WIC program, with another \$20,070,487 from state sources (GAO). As a result, the state WIC program has been able to provide WIC participants with a wide variety of food packages. There are more than 100 WIC agencies in New York.

Madison and Herkimer Counties share a sponsor agency of Planned Parenthood of Mohawk-Hudson Inc. The main office for Herkimer County is located in Herkimer, with clinics available in Salisbury Center, Poland, West Winfield, Ohio, Little Falls, Leonardsville, Frankfort, Middleville, Ilion, and Dolgeville. The main office for Madison County is located in Oneida, with clinics in Cazenovia, Chittenango, Canastota,

Georgetown, Leonardsville, Morrisville, Bridgeport, Madison, and Hamilton. Evening clinics are available, and they have recently started a Saturday clinic for those who absolutely cannot come during the week.

III. Literature Review

A. Does WIC Work?

Many studies have examined the impact of WIC on its participants. Most studies are very positive and it appears that WIC has some very positive effects on the women, infant, and children who participate. For example, findings by Basiotis (1998) show that WIC has been effective not only in increasing birth weight and decreasing the incidence of premature births, but that it has also improved hematological status and nutrient intake. The national WIC website (<http://www.fns.usda.gov/wic/>) boasts that participation in their program has resulted in longer pregnancies, fewer premature births, lower incidence of moderately low and very low birth weight infants, fewer infant deaths, a greater likelihood of receiving prenatal care, and savings in health costs within the first 60 days of birth. Devaney, Bilheimer, and Shore (1992) provide concrete numbers for this savings: for every dollar spent on the WIC program, there was an associated savings in Medicaid costs ranging from \$1.77 to \$3.13. It does appear though that more studies have been done on the effect of WIC on women and birth outcomes, and much less on infant and child health. Chatterji, Bonuck, Dhawan, & Deb (2002) note that little is known about the benefits received by WIC infant, children, and postpartum women.

Arcia, Crouch, and Kulka (1990) have noted that even though WIC participation does not significantly affect total food expenditures (meaning that WIC participants do not spend more on food than non-WIC participants), it does contribute to a larger

proportion of home-cooked meals in the family diet compared to eating out. This leads to a more efficient use of the family budget (spending less on dining out) and also has a positive impact on the quality of food that the family is eating. WIC participants have also been able to free up money that is usually spent on WIC specific foods for other nutritional foods. WIC participation affects food composition (more nutritious food being purchased) rather than food expenditures. Herman, Harrison, Afifi, and Jenks (2004) state that additional food dollars that are freed up because of the use of WIC coupons are used to purchase higher quality foods needed for newborns and to pay bills.

Other studies are more concerned with the contribution of WIC to diet quality and nutrition. Basiotis (1998) uses the HEI (Human Eating Index) to determine if WIC affects the nutrition level of its participants. The HEI is an indicator of overall diet quality. It has ten equally weighted components, each based on different parts of a healthy diet. This study shows that WIC has a very strong, positive influence on household diet and nutrition. WIC participation contributes 23.45 points to the HEI score of a household, distributed relatively evenly through all ten components. This study also points out the contribution of WIC food vouchers and their ability to free up other income (such as job earnings or another source of food assistance) for other foods. This allows WIC participants to receive higher HEI scores for food from WIC packages as well as other purchased foods. Because of the WIC program's emphasis on nutrition education, it appears that WIC households are likely to improve diet quality.

Many studies (Family Planning Perspectives: 1985, Ku: 1999, Besharov & Germanis: 2001, Chatterji, Bonuck, Dhawan, & Deb: 2002, Devaney, Bilheimer, and Schore: 1992) note that participation in WIC has increased weight at birth and that there

are fewer incidences of child mortality when mothers participate in federally funded food supplements (such as WIC programs). The participation in prenatal care programs, an important part of WIC, could be an important factor in this result. According to Ku (1999), most studies conclude that WIC participation by low-income, pregnant women leads to healthier, heavier babies. Prenatal care is a significant aspect of the WIC program and it appears to be reaching a significant amount of participants (even though participation in the program does not require participation in prenatal care treatments). Devaney, Bilheimer, and Schore (1992) note that 9.6% of WIC participants did not receive adequate prenatal care compared with 22.4% of nonparticipants.

Besharov and Germanis (2001) are critical of the WIC program. They state that WIC has had little impact on the diets of children from one to four and that the program is largely ineffective in receiving the neediest children - the overweight. Besharov (2002) states that many of the WIC foods that can be bought with the vouchers are high-calorie, high-cholesterol foods, in other words, the wrong foods. He argues that the program should be used to introduce more healthy foods, like fruit and vegetables. Besharov also suggest that the nutritional education is ineffective as, on average, women only meet with a counselor for about 15 minutes every three months. WIC households receive food coupons that are more difficult to exchange for cash than coupons from other nutritional assistance programs and, therefore, they may not be as easy to use as those from other food assistance programs.

B. What Determines Participation in WIC?

Although WIC has been around since 1972, less information is known on the determinants of participation than any other anti-poverty program. Many studies have

shown that many more women, infants, and children can participate in WIC than actually do. For instance, in 1980, the federal government estimated that only 21 percent of eligible women in Massachusetts were enrolled (Family Planning Perspectives: 1985). Bitler, Currie and Scholz (2003) note that 58% of all infants nationwide in a given month are eligible for WIC, but only 45% actually participate, resulting in a participation rate of 73.2%. Nine million children (ages 1-4) are eligible, but only 38% participate. Of the eligible women, only 66.5% participate. These numbers show that the WIC program could reach many more targeted recipients than it currently does. Ver Ploeg and Betson (2003) find that infants who are eligible have a high participation rate, eligible women have somewhat lower participation rates, and finally, eligible children have the lowest participation rates.

One problem in determining participation rates is how to determine when a woman is eligible for WIC. Should she be counted eligible at the time of conception or at the time she learns that she is pregnant. WIC estimates show that more than half of all women participating enroll when they are at least four months pregnant (Oliveira and Blaylock: 2003). Other issues such as what constitutes a family also come into play. Also, the time frame for considering income is hard to determine: is it the previous years or the current income? This poses many questions, since income may decrease during the period of time during pregnancy and birth.

The fact that many people eligible for WIC do not participate highlights the importance of isolating factors that influence WIC participation. The states with stricter guidelines see less participation. The more people that the program can get to participate, the more people who will receive its benefits. Also, since the USDA uses their

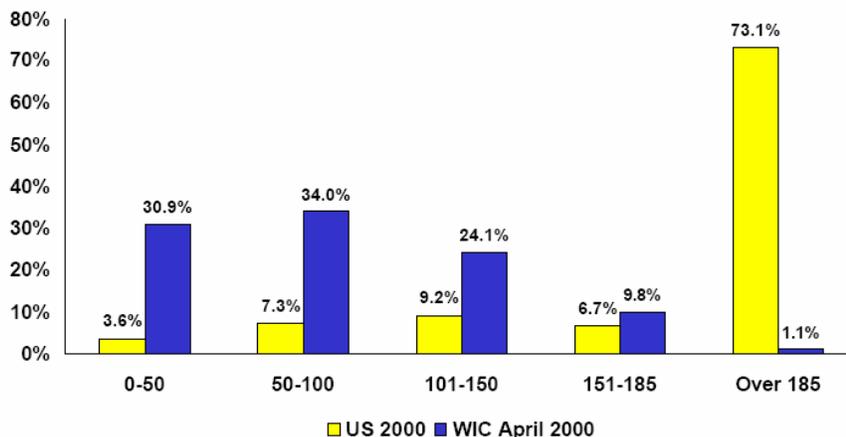
predictions each year as a basis for budget allocation, incorrect predictions could lead to the rejection of eligible, needy people from the program.

When making the decision to participate, the individual weighs the benefits they receive (value of the food package and nutritional advice) against the so-called costs of joining the program (time and effort required for the program, going to the WIC office, going through eligibility screening, the stigma of participation). So, understanding who benefits the most from the program and the costs that individuals face if they enroll has important implications on who will participate.

The FNS Executive Summary for the WIC program (2000) found that approximately 80% of women participants are between the ages of 18 and 34. In fact, only 8% of participants are 17 or younger. Pregnant women were more likely to enroll during their first trimester (46.7%) compared to the second trimester (only 39%). Caucasians made up the largest percentage of participants, followed by Hispanics, African-Americans, Asians, and then American Indian or Alaskan natives. Since 1992, the proportion of Hispanics has steadily increased, while the proportion of Caucasians and African-Americans has decreased. Slightly more than half of WIC participants receive at least one other type of assistance. As can be seen in Figure 4, WIC recipients are predominantly poor, more so than the rest of the population: two-thirds of WIC recipients are at or below the poverty line, compared to only 11% for the population as a whole.

Figure 4:

Comparison of Poverty Levels of WIC Participants Reporting Income to Persons in the US Population



Source: USDA Participants and Program Characteristics, 2000

The “National Survey of WIC Participants: Final Report” gives an idea of how the demographics of WIC participants have changed since 1988. Western states have seen an increase in participation rate, and so has the Hispanic population. Pregnant women and infant enrollments have declined as a percentage of total WIC population, but the percentage of breastfeeding women has doubled, and child enrollments as a percentage also increased. The common characteristics of WIC recipients are: most are between the ages of 18 to 34, the majority of women have completed 12 years of education, and the majority of women are employed. For those who are not employed, more than half were employed in the last year. As for the household, the average household size is 4 persons, and 58% of WIC participants have at least one other family member who is also a participant. Nearly two-thirds of participants have an average income below the poverty line. Almost one-half of participants receive at least one other form of assistance.

Bitler, Currie, and Scholz (2003) examine the determinants of WIC program participation. Why don't people who are eligible participate in the program? The authors use national SIPP (Survey of Income and Program Participation) data. They find that if the WIC program would serve all eligible members, it would be considerably larger than it is now. Their study shows that states with stricter eligibility rules have lower participation rates. One example of stricter rules would be higher cutoff levels for nutritional risk. The costs of participating in the program (such as time, travel, and stigma) have an impact on whether or not an individual participates. They ran a regression model to determine participation rates. Their variables included are race, ethnicity, age, participation in AFDC/TANF/food stamps/Medicaid, educational attainment of mother, month of the year, number of children in the household, number of local agencies per capita, cost of food packages provided, proof of income requirement, and hematocrit cutoff level. This regression includes several demographic and economic variables for the state, such as the unemployment rate, share of population in poverty, share of Hispanic population, share of African American population, share of births to unmarried women, share of population in urban areas, and real median family income.

Their results were very beneficial to the study of WIC participation. They showed that these demographic characteristics are important to consider. Participation is higher among African-Americans and Hispanics than Caucasians, but is lower for Asian-Americans. Families are more likely to participate in WIC as the number of children under the age of 18 in the household increases. A high Medicaid and food stamp participation rate is also associated with a high WIC participation rate, although other assistance programs did not show any correlation. But, higher AFDC/TANF benefits lead

to a lower participation rate in WIC, likely because the family does not need as much other assistance if they are getting cash assistance. Contrary to their predictions, distributing WIC benefits monthly (instead of less often) was positively correlated with WIC participation. Requiring proof of income and a higher nutritional risk cutoff both decreased the likelihood of participation. Individuals with more education are less likely to participate. Also, those who live in urban areas are more likely to participate. The share of births to unmarried women has a negative effect on the probability that children will participate. The cost of food packages has a positive effect on the participation of children, but a negative impact on infants.

Ver Ploeg and Betson (2003) note the importance of external factors in determining participation rates. They also look at the SIPP data set to do so. Ver Ploeg and Betson consider four sets of factors that could influence participation in WIC: (1) how participation in WIC correlates with participation in other programs, (2) personal characteristics, (3) WIC differing program characteristics by state, and finally, (4) external factors. During poor economic times, more people will be income-eligible for the program, which may lead to higher participation rates. Also, higher birth rates may also lead to more eligible infants. They note though that previous studies (including Bitler, Currie, and Scholz (2003)) suggest that external factors are not significant in determining participation as it does not appear that WIC participation is correlated with the state-level indicators of economic need, such as the unemployment or poverty rates. As for personal characteristics, their results show similar findings as Bitler, Currie, and Scholz. Hispanics are more likely than Caucasians to participate, and Asian-Americans are less likely. Ver Ploeg and Betson find that the more educated the mother is, the less

likely they are to participate. They suggest that this might be because these mothers are not aware that they are eligible (since the income eligibility for WIC, at 185% of the poverty line, is actually quite high, although many do not realize this and therefore do not realize they are even eligible for this program). Individual factors (education, race, marital status) appear to play a large role in determination. And finally, program characteristics also play a large role. For example, anything that increases the transaction cost of the program leads to less participation.

Chatterji, Bonuck, Dhawan, & Deb (2002) use data from the 1996 National Longitudinal Survey of Youth and the Children of the National Longitudinal Survey of the Youth. They observe that WIC participants are younger, poorer, and less educated than non-participants. They are also less likely to be employed and less likely to be married.

Woelfel, Rayane, Pruzek, Stratton, Chen, and Edmunds (2004) examine the barriers to WIC participation through a literature review, five focus groups (with parents of WIC participants), an expert review panel, and a survey administered to parents of infants and children on WIC. They were able to identify several barriers that many participants indicate prevent them from participating in the WIC program. These include: waiting too long (the most frequently cited barrier at 48%), difficulties in bringing the infant or child back to recertify, and difficulties rescheduling appointments. For example, in New York State, 27% of children enrolled failed to recertify after their first six months in the program, with another 26% failing to recertify for a second time. Overcrowded and noisy sites were noted by 36% of the respondents as a barrier to participation, and the repetitive or boring nature of the nutritional education was listed by

approximately 30%. Few respondents to their survey noted any problems with WIC staff, program rules and regulations, or getting to a WIC site. It was also found that social support and stigma against receiving any sort of aid may be a reason why some eligible participants do not participate, but it does not appear to alter the recertification of those already participating.

IV. Data and Descriptive Statistics:

The data that will be used is from a sample of respondents to a telephone survey of those who left Madison County cash assistance from 1995-2000. The response rate to the survey was 22%, giving an initial sample size of 236 households. Trained volunteers for the Madison County Community Action Program (CAP) administered the survey. Relevant information from the survey that is important to examining the determinants of WIC participation includes income and family composition, number of adults and children in the household, race of the individuals in the household, marital status of the respondent, educational attainment, employment status, and participation in food assistance programs (including WIC).

Of the 236 responding households, only households that had a total income less than 185% of the poverty line (the income guideline for the WIC program) are included, since only those households are eligible for WIC. Since this survey did not ask if the respondent was pregnant or not, this analysis does not examine the pregnant women's decisions to participate in WIC. Instead, this study focuses only on households with small children (ages 0-4) and their decisions to participate. As a result, we eliminated all households who did not have children under the age of five. The final sample includes 56 households that met both the income eligibility guidelines and the age requirement for

infants and children. In our sample of 56 households, 34 of those participated in WIC and 22 of them did not. This is a good representation of the WIC population as a whole. The overall participation rate for Madison County is 61%, which is almost exactly what we observe in our sample. General descriptive statistics can be found in Table 3, where the means or percentages can be found on each variable included in the regression.

Table 3: Means and Percentages			
	All Eligible N=56	WIC Participants N=34	WIC Non-Participants N=22
WIC Children	1.33	1.53	1.09
Older Children	1.09	1	1.14
Children Under 18	2.41	2.53	2.23
Income	18383.57	16847.75	20547.69
Household Size	4.268	4.35	4.14
Single Parent Household	30.36%	35.29%	22.73%
Married Household	32.14%	32.35%	31.82%
Unmarried Household	16.07%	11.76%	22.73%
Other Household	21.43%	20.59%	22.73%
Age	29.6	29.37	29.99
# of hours worked/week	34.8	36.67	32.56
White	92.86%	94.12%	90.91%
Food Stamp Participation	42.86%	50.00%	31.82%
Medicare Participation	67.86%	82.35%	45.45%
Child Health Plus Participation	17.86%	14.71%	22.73%
Child Care Subsidy Participation	14.29%	17.65%	9.09%
Food Pantry	30.36%	23.53%	40.91%
Employed	58.93%	52.94%	68.18%
College	12.50%	14.71%	9.09%
High School	80.36%	79.41%	86.36%

Of those who participated in WIC, the average household income is \$16,848. This is \$3,700 less than the mean household income for those who did not participate (at \$20,548). Given what we know from the “National Survey of WIC Participants: Final Report” that more than two-thirds of participants are below the poverty line, these numbers are not surprising. This makes intuitive sense since it is likely that the more income an individual makes, the less likely they are to participate in the WIC program (even though they are still eligible). The benefits of WIC may not be worth the hassle or

the stigma that is attached to being on a food assistance program for higher income households.

Annual household income will be included as an explanatory variable in the final regression. It will be important to find out if the more money a family makes, the less likely they are to participate since the trouble of going to the WIC office, receiving vouchers, and using them at the store may not be worth it. Also, maybe the stigma of using food assistance may not be worth it if the family does not really need it to get by. Therefore, income is expected to have a negative impact on the likelihood of WIC participation: that is, as income increases, the chance of WIC participation decreases.

The household size and type of households are other variables to consider. The household size of non-participants and participants in WIC is not significantly different (at 4.35 and 4.14 respectively). There are some differences in family structure however. Out of the 17 single-parent households, 5 do not participate in WIC, but 12 do, showing that 70% of eligible single parent households participate in WIC. This is what can be expected from the results of Chatterji, Bonuck, Dhawan, & Deb (2002), which showed that WIC participants are less likely to be married. On the other hand, only 32% of those who participate in WIC are married. Of the 18 married couple households, seven do not participate and eleven do.

It will be important to look at these different household types in our regression since we are interested in looking at if a person's marital status is important in determining whether or not she (and her children) participates in WIC. In order to simplify, we will only include the married couple variable in our regression, so we can simply compare how this group compared to all other groups. It is expected that the

married couple variable will be negative, since previous results have shown that WIC participants are more likely to be single than married.

When looking at age, it is discovered that the two groups, participating and non-participating, have the same mean. Also, when running a one on one regression between age and WIC participation, there was a t-value of 0, leading to no correlation between the two variables. This is surprising, since other studies mentioned earlier have shown that WIC participants are younger than those who do not participate.

The age of the children in the household is another important variable to consider. For non-participating households, the average number of children under the age of 18 was 2.23. For participating households, this number was slightly higher, at 2.53. This is what is expected, since we would think that the more children a household has to provide for, the more likely they are to participate in WIC. This result is found in Bitler, Currie, and Scholz (2003). It is also important to look at the number of children who are eligible for WIC and the number who are not. Both of these variables will be in the regression and are both expected to have a positive impact on WIC participation. In the 22 households that do not participate in WIC, the mean number of WIC-age children is 1.09 and the mean number of older children is 1.14. The mean number of WIC-age children in the 34 households that participate in WIC is 1.53, which we intuitively expect since one would think the more number of children eligible for receive the benefits, the more these benefits will outweigh the costs of participating. On the other hand, the mean number of older children in participating households is only 1. This is a little less intuitive, since you might think that the more children in the household, the more likely

the household is to participate since there are more mouths to feed. Both of these variables will also be included in the regression and both are also expected to be positive.

Of the 34 households that participate in WIC, 16 of them are unemployed and 18 of them are employed, making 53% of people on WIC employed and 47% unemployed. Of the 23 who were unemployed, 7 of them do not participate in WIC and 16 of them do. These descriptive statistics give us an idea on how important the employment variable is. It should be included in our final regression. From this result and previous studies, it is expected that the employment variable will have a positive impact on the likelihood of WIC participation. In a counterintuitive result, it is found that WIC participants, on average, work more hours per week than non-participants, at 36.7 hours for participating and 32.5 hours for non-participating.

Since upstate New York area has a very high majority of Caucasians, it was not a surprise to find that out of the 56 households, only 4 of them are non-white. Of these four, two participate in WIC, and two do not. Since our sample is very highly skewed towards a majority of Caucasian households, our regression results may not be as clear as they would be in this variable if our sample had greater diversity. However, I will still include it in my regression and it is expected to be negative (since Hispanics and African Americans are more likely to participate in WIC than Caucasians).

From most of the literature, we have read there is a strong correlation between participating in the WIC program and participating in food stamps and Medicaid. Of the 56 households, 24 of them were on food stamps. Seven of these households do not participate in WIC, and 17 of them do, making 70% of households on food stamps also in WIC. 50% of households on WIC are also on food stamps. Of the 34 who are in the

WIC program, only six of them do not also participate in Medicaid, making 84% of those who participate in WIC also participate in Medicaid. Of those on Medicaid, only 10 do not participate in WIC, and 28 do, making 74% of those on Medicaid who participate on WIC. One important thing to note (maybe for future policy plans), is that it appears that if the household is on WIC, they are less likely to need to go to their food pantry for additional assistance: if they participate in WIC, 26 do not go to the food pantry and 8 do, but if they do not participate in WIC, 13 do not go to the food pantry and 9 do. None of these variables will be included in the regression because of the high correlation and questionable causality between participating in them and participating in WIC. This is because the families that participate in other programs are automatically income eligible for the WIC program, which makes it easier to participate.

It is not surprising to find that of the 56 households in our survey that meet the eligibility guidelines for WIC, only 7 of the respondents have graduated from college. It is important to note though that of these 7, only 2 do not participate in WIC. This could be because these households are more aware of the services and better understand the benefits of participating in WIC, although it is contrary to the finding in Ver Ploeg and Betson that suggest the more educated the household is, the less likely they are to participate. Of those that participate in WIC, 29 of them have no college degree, and 5 of them do have one. We must remember though that we are looking at just a population of those at or below 185% of the poverty line, which excludes many college graduates (since with a degree you are more likely to earn more money). Only 9% of those in the survey are both college graduates and WIC participants and only 15% of those on WIC are college graduates. Looking at high school graduates, out of the 48, 19 do not

participate in WIC, and 27 do. Almost 80% of those on WIC are high school graduates. Of those that participate in WIC, 7 have no high school degree and 27 do. For the regression, both of these variables will be included.

V. Regression

The results for the regression estimate for WIC participation are presented in Table 4. We have used a probit analysis since the dependent variable is a dummy variable.

Table 4: Regression Results		
Variable	Marginal Effect	T Value
<i>Married Couples</i>	<i>-0.231904</i>	<i>-1.68</i>
High School	-0.0492324	-0.29
College	0.2208199	1.13
<i>Income (1000s)</i>	<i>-0.0124793</i>	<i>-1.73</i>
Age	-0.0001744	-0.02
<i>Employed</i>	<i>-0.2292982</i>	<i>-1.83</i>
White	0.3166377	1.13
WIC Clinic	0.0878255	0.68
<i>WIC Children</i>	<i>0.4634929</i>	<i>2.85</i>
Older children	0.06115675	0.99

As expected, the married couple variable is significant and negative. Holding everything else constant, if the couple is married, they are less likely to participate in WIC by 23.19 percentage points. This result is what we would expect, since previous studies have shown that WIC participants are more likely to be single. Therefore, a married couple household would have a lower chance of participating than the other household types (including single parent household and unmarried couple household).

The income variable is also significant and negative. As the annual household income increases by an increment of \$1000, the household is less likely to participate by 1.25 percentage points. This is what was predicted by previous studies. As the income

of the household increases, the household is less likely to need the additional food assistance. At a certain point, the cost will begin to outweigh the benefits, and the household will no longer feel the need to participate in the WIC program even though they are eligible.

As predicted, the employment variable is negatively related with WIC participation. If the respondent to the survey is employed, the household is less likely to participate by 22.93 percentage points. This is what was expected, since the inconvenience of getting to the WIC office might be very high since the clinic is mostly open during regular work hours.

The number of WIC eligible children is also shown to be a significant factor. If the family has one more WIC eligible child, they are more likely to participate by 46.35 percentage points. This makes intuitive sense (as well as supporting the results from previous studies) since if the family has more children who can receive WIC benefits, the costs of going to the WIC site and signing up would be much less than the benefits received. However, it is surprising that the older children variable is not significant as well, although it is the predicted positive sign suggesting that the more older children the family has, the more likely their household will sign up for WIC benefits.

The education variables turned up interesting results. The high school variable (a dummy variable for whether or not the respondent had a high school education) was insignificant but negative, meaning that if the respondent had a high school education, they were less likely to participate in WIC. On the other hand, the college variable (a dummy variable for whether or not the respondent had a college degree) was also insignificant, but it was positive, meaning that if the respondent has a college education,

they would be more likely to participate in the WIC program. This could be because they are more aware of programs that are there to help them since they are more educated. It is interesting though that the two variables had different signs.

The age variable in our regression was almost completely insignificant. The age of the respondent had no correlation with their household's participation in WIC. We had expected the age variable to be negative, since many of the previous studies showed that WIC participants are usually young (teenagers).

As mentioned earlier, since the survey took place in Madison County (in Upstate New York), there was not a lot of racial diversity among the respondents. They were almost all Caucasians. For this reason, I did not expect my race variable (a dummy variable for if the respondent was white or not) to be significant, and it was not.

The fact that the having a WIC clinic in your hometown did not significantly affect WIC participation was surprising. Having a clinic close by would make it easier to find a way to get to the clinic and it would also most likely mean that the process would be quicker (since transportation would be faster). This variable is positive though, which follows the lines of our intuitive thinking, even if it is not significant.

VI. Interviews

In order to get qualitative as well as quantitative data on the determinants of WIC participation, several women who were eligible for WIC, because of the age of their children, were interviewed. Some of the women who were called had participated in the food pantry in Ilion and Frankfort, NY (in Herkimer County). When signing up for the food pantry, households are required to give information, including their age, age of children, phone number, and whether or not they participate in WIC. We know that all of

these households are income eligible for WIC because the guidelines for the food pantry are at the same level as WIC. Some of these women had been on WIC services before, so they were able to provide insight into why some eligible participants do not find it worthwhile to participate. The other women were contracted through the Community Action Program for Madison County.

Speaking to WIC eligible individuals who do not participate in the program provided even more knowledge about why WIC eligible families choose not to participate. One of the main issues that these women discussed that cannot be described in a regression analysis is the stigma that is related to participating in this food assistance program and the poor treatment they perceived both at the WIC clinic and when using their vouchers in supermarkets. When deciding to participate or not, one must weigh the costs and benefits. One of the major costs of participating is the stigma. Some who had been on WIC before reported that at the grocery stores, they felt as if the people around them would give them a look and stare, making them feel uncomfortable. Some clerks were also condescending and would create hassles for them when they came to their line. Some stores had only certain lines taking WIC vouchers. One woman who has a four year old child felt degraded in the WIC office. She reported that her caseworkers made her feel bad when she had trouble breastfeeding and could no longer do it. She felt like she needed to prove to them that she really could not do it and was upset that they did not just take her word for it. She felt as though the people at the WIC office looked down on her since she was asking for their help. The income result from the regression analysis is consistent with this stigma: those who earn slightly more do not find it necessary to participate since they do not need it as badly as others might. Since the stigma is high,

and therefore the cost of participating is high, those with a higher income (but still within the eligibility guidelines) may choose not to participate.

Others complained of the strict guidelines of WIC, which is another cost of participating in the program. They only allow you to get certain types of milk instead of what you want. Or, for example, the cereal voucher would be for only a certain weight, and they would have trouble finding that specific weight at the store. Other times, stores had run out of the formula they needed to buy. This result could also be considered consistent with our income results: If the family does not completely need the extra help to buy the type of milk that the WIC office says they must buy, than they may be less likely to join WIC and therefore choose the type of milk they want.

One woman I spoke with did not even realize that she was eligible for WIC since she had been told she was not eligible for food stamps and just assumed it would be the same for the WIC program. However, the income guidelines for WIC are much more generous than for food stamps. She did not realize that she could participate in WIC if her income was as high as 185% of the poverty line. This is a serious problem for the WIC program, since, without the proper information, individuals cannot make the proper cost-benefit analysis on whether they want to participate.

Transportation and ability to get to the WIC clinic sites does not appear to be a problem for any of the women I spoke with. Transportation would be a potential cost that might deter people from participating (they might find it hard to get to the WIC site either because of distance or lack of transportation options). Most of the women interviewed knew where the sites were. Some of these women had previously been on WIC and had not found it a problem to find a way to get there. It appears that the WIC

offices in Herkimer and Madison counties have done a good job of providing sites throughout the area. This is consistent with our WIC clinic variable that was insignificant. It appears that WIC clinics in the two counties are easy to get for residents of most towns.

However, some women complained of the time spent at the WIC office. Many thought it was a very long process and that it took a long time to get to each individual person in the waiting room. Many mothers found it hard to take part in the nutrition classes that are highly recommended since they have children at home or with them. The cost of the time spent in the WIC office appears to be significant for many households and is a reason that many might not participate. It does not appear that for many people the benefit of the nutritional classes outweigh the cost of spending time in these classes. This result is consistent with our employed variable. Those who are employed are less likely to participate. This could be because they cannot take the time out of their work schedule to participate in the nutrition classes or even go to the WIC office to pick up checks.

VI. Reforms:

From the evidence that we have found in previous studies, our own regression analysis, and actually speaking to WIC eligible individuals who do not participate, it appears that WIC could do a better job of targeting needy families and making them more aware of the services they could benefit from. One suggestion is to simply get the word out so that people can make their own decision knowing all of the costs and benefits. The *National Survey of WIC Participants: Final Report* suggests advertising more is one solution. They reported that almost all of WIC participants heard about the program from

friends, family members, or doctors (about a 1/3 heard from each category). Very few heard about the program from WIC-related advertisements. It appears from at least one of our interviews that some people simply do not know the eligibility guidelines and therefore do not even realize they can participate in the program. In some states, commercials advertise the benefits of WIC to raise awareness to the program.

It appears from our discussion with individuals, that more people would find it beneficial to participate if state and local agencies were more flexible in their food packages, increasing the benefits of the program. Because of the long wait that some women complained about at the WIC offices, it may be more beneficial to limit the number of people who can come to the office in one day so that there is not an overload. It appeared to some potential clients that there were not enough workers to take care of them, and this was a great deterrence to staying with the program. Another potential addition to the WIC offices would be some sort of day care, so that parents of the young children could still attend the nutritional classes. These classes are a great benefit of the WIC program, but are often underutilized because parents cannot afford to leave their kids home for so long or cannot give the needed attention if their children are with them.

The stigma of participating in WIC appears to impose a significant cost on families. One suggestion of helping to mitigate this stigma is to update the voucher system so it is more like the new food stamp program where participants have a “credit card” instead of vouchers which are highly visible. Therefore, people in the stores might not necessarily know that the individual is using a WIC voucher, which makes that individual more comfortable with the situation. Training sessions for managers and clerks working in WIC stores might also reduce the stigma faced by participants.

Perhaps just letting local stores and their employees know how much money is made by local stores from the WIC program would change their attitudes about serving WIC clients.

Several of the mothers stated that they would definitely participate if their child were going to be eligible for longer or if they had more children who could participate, increasing the benefits of the program. One solution to this would be to extend the age guideline for WIC children to 6 or 7. This would increase the benefits of participation and likely increased participation rates. However, this policy is not at the control of the County agency and would require action at the state and/or national level.

Many of the authors had their own suggestions as well. For example, Bitler, Currie, and Scholz (2003) suggest targeting Asian women and suburban women who are less likely to participate. If these groups of eligible women did indeed join the program, the participation rate would increase significantly. However, these recommendations are not relevant for Madison and Herkimer Counties. The *FNS Adolescent WIC Participants Study Volume I: Final Report* suggests that one way of increasing enrollment is to target adolescent women. Adolescents normally enter the WIC program late in their pregnancies, typically not until the first trimester is over. This is often because they face barriers to enrollment: they often do not know they are pregnant until later on in their term, they do not want to accept assistance, and they often do not have adequate transportation to get to WIC offices. However, those in this group of women who do participate benefit greatly. More than three quarters of adolescent respondents stated that their eating habits improved while they were in the WIC program. They seemed to be

particularly interested in learning how to stretch their dollars and how to pass these healthy eating habits along to their kids.

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