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# **Barriers to Retention Among NYS**

## **WIC Infants and Children\***

**Final**

**Report**

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### **Principal Investigator**

Mary Lou Woelfel<sup>a</sup>, M.A., Sociology

### **Authors**

Mary Lou Woelfel, M.A. Sociology

Robert Pruzek<sup>b</sup>, Ph.D. Statistics

Howard Stratton<sup>c</sup>, Ph.D. Mathematics

Donald Hernandez<sup>d</sup>, Ph.D., Sociology

Gene Shackman<sup>a</sup>, Ph.D., Sociology

Rayane AbuSabha<sup>e</sup>, Ph.D., Nutrition, R.D.

### **Statistical Consultants**

Howard Stratton, Ph.D., Mathematics

Robert Pruzek, Ph.D., Statistics

Donald Hernandez, Ph.D., Sociology

Victoria Lazariu-Bauer, Ph.D., Biometry and Statistics

### **Data Analysis**

ShuGuang Chen<sup>c</sup>, M.S. Biostatistics

Lynn Edmunds<sup>a</sup>, R.D., M.S. Statistics

Daniel Kellis<sup>a</sup>, A.S., Mathematics and Science

### **NYS WIC Program Outreach and Retention Committee Action plans for removing barriers to retention**

Sandy DeMeo<sup>f</sup>, Coordinator

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<sup>a</sup> New York State Department of Health, Division of Nutrition, Evaluation and Analysis Unit

<sup>b</sup> State University of New York at Albany Department of Education Psychology

<sup>c</sup> State University of New York at Albany School of Public Health Department of Biometry and Statistics

<sup>d</sup> State University of New York at Albany Department of Sociology and Center for Demographic Studies

<sup>e</sup> U.S. Dept. of Agriculture, Food and Nutrition Services, Office of Analysis, Nutrition and Evaluation

<sup>f</sup> New York State Department of Health, Division of Nutrition, Bureau of Supplemental Foods Program

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# **Barriers to retention among infants and children on WIC**

## **Executive summary**

The Special Supplemental Nutrition Program for Women, Infants and Children (WIC) became an authorized grant program in 1974 by amendment to the 1966 Child Nutrition Act (PL94-105). It is administered by the Food and Nutrition Service (FNS) of the U.S. Department of Agriculture (USDA) through grants to state agencies. WIC state agencies work within FNS regulatory guidelines that allow broad latitude in the delivery of services. State agencies, in turn, operate through a network of local WIC agencies. While working within federal and state rules and regulations, local WIC agencies have substantial discretion in implementing WIC. The barriers to retention experienced by WIC clients may be consequences of federal, state or local provider policies, rules, regulations, or procedures. Other barriers to retention may arise because of the particular circumstances of individual clients, their family or household situation, or the communities within which they reside.

At no cost to participants, WIC provides supplemental nutritious foods, nutrition education and health care referrals to low-income women, infants and children up to the age of five. Participants are given WIC checks that can be redeemed at WIC approved stores for the purchase of specific nutritious foods. To be eligible for WIC benefits and services, an applicant must: (1) be a woman who is pregnant or postpartum, or an infant or a child less than five years old; (2) have an income below 185 percent of federal poverty guidelines (set annually by the Department of Human Services); and (3) be at medical or nutritional risk as verified by a health professional. After they are officially certified as eligible, infants can participate for one year; children (aged 1 through 4) can participate for six months. At the end of each certification period, the participant must be re-certified to continue participating.

### **Purpose of study**

The purpose of this study was to identify barriers to retention of infants and children on WIC; that is, to identify barriers that deter parents/caretakers from continuing to participate in WIC, despite the continued eligibility of their infant or child. The specific objectives included identifying barriers to retention of infants and children in WIC; assessing differences in barriers to retention by race/ethnicity and geographic area; and identifying barriers to check usage.

### **Study methods**

A survey, designed to take approximately 15-20 minutes, was based on a review of the literature, results of five focus groups with WIC participants and suggestions from an expert guidance team. Information was collected on 68 potential barriers to retention, selected demographic and economic variables, participation in public assistance program, perceived

benefits of WIC, social support and attitude information. Outcome information included failure to pick-up or cash WIC checks. The survey was administered to 3,167 parent/caretakers at 51 NYS local WIC agency sites.

## **Respondent characteristics**

The majority of parents/caretakers of infants and children on WIC who participated in the survey had at least a high school education (74 percent). Approximately one in four, however, did not graduate from high school. Most were single (56 percent), a significant percentage were married (35 percent) and 9 percent were divorced or separated. The majority rented their homes (78 percent); about two-thirds lived in households with incomes below 100 percent of the federal poverty guidelines; about one in four lived in households with incomes below 50 percent of poverty. The average household size was 3.7 persons. Many parents/caretakers worked full time (23 percent) or part time (21 percent). Eight percent in upstate and 17 percent in NYC reported Sometimes or Frequently not having enough to eat in the past few months. Most respondents reported participation in one (51 percent) or two (35 percent) food programs.

A higher percentage of Hispanic respondents than Black and White respondents were younger, did not have a high school education, were not employed and reported experiencing food insecurity. White respondents were more likely to be married and own their homes, less likely to live below 50 percent of poverty or to receive Food Stamps, TANF, Medicaid or to participate in more than one food program.

In upstate NY, the majority of respondents were White, whereas in NYC the majority of respondents were Black or Hispanic. Compared to upstate NY, a higher percentage of NYC respondents received benefits from only one food program, rented their homes, were not employed, were single, did not finish high school and lived in households with incomes below 50 percent of poverty. A higher percentage of NYC respondents than upstate NY respondents reported food insecurity and fewer reported receiving Medicaid or Food Stamps.

## **Results**

Results indicated that local WIC agency staff were almost universally perceived by survey respondents as customer friendly, speaking their language, culturally sensitive, attentive to their concerns, giving neither conflicting information or negative treatment. Few respondents reported problems with WIC rules and regulations, the certification process, scheduling an appointment or getting to a WIC site and few respondents reported personal or social factors affecting program retention. Survey respondents identified a comparatively small set of barriers to retention: 11 of 68 potential barriers identified in this study were reported by more than 20 percent of respondents to be a barrier sometimes or frequently. The identified barriers clustered into five organizational areas of WIC services: waiting time, the facility, nutrition education, food procurement and the food package.

Waiting too long in general was the most frequently cited barrier, reported by 48 percent of respondents. Waiting more than an hour to re-certify (27 percent) was also a frequently

reported barrier. Facility barriers included reports of overcrowded, noisy facilities (36 percent) with nothing for children to do (42 percent). Nutrition education was viewed by many as boring (27 percent) and repetitive (33 percent). Many respondents reported difficulty matching the WIC food package size requirement with the food container size in stores (23 percent) and not getting the right cereal box size (41 percent). Many respondents reported that the WIC benefit provided too little formula (38 percent) or too little juice (27 percent). The most frequently cited barriers were the same across race/ethnic groups, for upstate NY and NYC respondents, although the rank order differed. However, there were some statistically significant differences across race/ethnic groups; mostly among barriers cited less frequently. A higher percentage of Black respondents than White and Hispanic respondents had difficulty getting off work when scheduling appointments (19, 12, 14 percent, respectively). A higher percentage of Hispanic respondents than Black or White respondents reported a language barrier (7, 0, 1 percent, respectively), the WIC diet as inconsistent with their cultural diet (9, 3, 6 percent, respectively), neighborhood safety (8, 3, 5 percent respectively) and too little milk (19, 10, 13 percent, respectively). Hispanic and Black respondents, more than White respondents, reported overcrowded sites (41, 40, 32 percent, respectively) and too little dry beans (9, 9, 4 percent, respectively). In NYC, four additional barriers were reported by at least 20 percent of respondents. These included too little cheese (23 percent), too little milk (21 percent) and nutrition education as too long and not very useful (27, 29 percent, respectively).

Forty-six percent of respondents reported failure to pick-up or cash their WIC checks during the prior few months period. Analyses to identify barriers predictive of failure to use all WIC benefits showed that *total number of barriers*, *site of services*, *difficulties associated with bringing the infant/child to re-certify* and *rescheduling appointments* were key variables associated with failure to use WIC checks. Results indicated that with each additional reported barrier, there was a two-percent increase in failure to use WIC checks. In addition, a large percentage of those who failed to use WIC checks (40%) also reported that they had difficulty rescheduling appointments or bringing the infant to re-certify. As noted, waiting too long was associated with an increased number of reported barriers and check usage.

## **Conclusion**

Many barriers to retention may be addressed directly by local WIC agencies; other barriers are under the purview of state and federal policy makers. Strong and concerted efforts have been made to eliminate barriers identified in this study that affect retaining eligible infants and children in the NYS WIC Program. To this end, the NYS WIC Program followed a multi-faceted approach. First, the recently completed automation of the WIC Program should reduce barriers to retention. In particular, one goal of WIC automation was to reduce waiting times, which is an often cited barrier to retention. Second, NYS is working with the National Association of WIC Directors Evaluation Team to identify virtues and limitations of extending the children's certification period from 6 to 12 months; if feasible, this should reduce waiting times, reduce problems associated with bringing the infant/child to re-certify and difficulties rescheduling. Third, a new nutrition education curriculum was designed to revitalize nutrition education by making it more relevant to today's nutrition concerns. The new curriculum includes up-to-date practices, lesson plans and training aides; it aligns nutrition education with Eat Well Play Hard (EWPH), a NYS nutrition and physical activity intervention designed to



prevent childhood overweight and reduce long-term risks for chronic disease. Relatedly, the WIC Program is concerned that the importance of the local WIC nutrition educator to the success of WIC is not always recognized. The NYS WIC Program therefore is attempting to determine the best approach to recognize and elevate the role of WIC nutrition educators in improving the health status of WIC participants. Fourth, an annual NYS WIC participant survey, already in place, will be used to monitor WIC participants' dietary practices, behaviors and physical activity. Fifth, the food card has been reevaluated and recommendations are being proposed to expand the choice of cereals and juice. Sixth, the NYS WIC Program Outreach and Retention Committee, which consists of state and local WIC agency staff, incorporated study findings into their local WIC agency training sessions. Study results were presented at three NYS Regional Summit Meetings on Outreach and Retention. Barriers identified were used as the basis of facilitated group discussion on creative and innovative solutions to reach and retain persons eligible for WIC. Future plans include assisting local WIC agencies to focus specifically on participant flow practices to determine if efficiencies in clinic operations can be improved to minimize waiting times.

It may be useful to conduct research to determine if reported barriers, such as waiting too long for services and overcrowded, noisy sites, are related to the allocation of resources from federal to states or from states to their local WIC agencies. The manner in which resources are allocated may differentially affect the ability of local WIC agency to adequately retain participants. Further, assessing differences between agencies with high rates of check usage to agencies with low rates of check usage and agencies with long waiting times to agencies with shorter waiting times may help identify best practices for smooth, efficient and effective service delivery.

Finally, study results indicated a higher percentage of food insecurity among Hispanic respondents than Black and White respondents and among NYC respondents than upstate NY respondents. While we need to ensure that appropriate referrals to other food programs are made to respondents who indicate food insecurity, it may also be useful to examine the WIC food package for this higher-risk group to ensure they receive appropriate levels of nutrition.

## Statement of problem

“Barriers to Retention among WIC Infants and Children” is a United States Department of Agriculture (USDA) Food and Nutrition Services (FNS) WIC Special Projects grant (No. 59-3198-7-525). This grant was awarded to the New York State (NYS) Department of Health (DOH) Division of Nutrition (DON) Evaluation and Analysis Unit. An overarching goal of the study funded by this grant was to provide information that would be helpful to government and local agencies in their efforts to ensure that WIC services are provided effectively, efficiently and equitably. The study focused on barriers that may deter infants and children from continuing with the program. The eleven WIC agencies surveyed for this study are not a statistically representative sample of NYS or the nation, but these agencies were systematically selected to reflect the socio-demographic and urban-rural diversity of WIC participants and agencies. Thus, the findings of this study are relevant to understanding barriers to retention, that is, obstacles that may lead clients in WIC to stop participating in the program, despite economic circumstances that continue to make them eligible for program services. A sequential model of the WIC client participation process, which was developed and elaborated for this study, serves as a valuable tool for identifying and assessing barriers to WIC retention. This model might be adapted readily by other state agencies or health care delivery systems seeking to identify and assess barriers to retention in their programs.

The USDA FNS administers the Special Supplemental Nutrition Program for Women, Infants and Children (WIC) through grants to state agencies who in turn administer grants through a network of local WIC agencies who directly provide services to eligible participants. FNS rules and regulations provide state agencies with reasonable latitude in administering grants to local WIC agencies and state agency rules and regulations permit local WIC agencies reasonable autonomy in delivery of services. The barriers to retention experienced by WIC clients may be due, therefore, to federal, state and/or local provider policies, rules, regulations, or procedures. Other barriers may arise because of the particular circumstances of individual clients, their family or household situation, or the communities within which they reside.

Both NYS and US WIC program caseloads grew rapidly in the early 1990’s, slowed, then declined slightly. Nationally, WIC participation increased by 21 percent between 1991 and 1993, by 16 percent between 1993 and 1995, and by 7 percent between 1995 and 1997<sup>1</sup>. Similarly, in New York State, total caseload increased by 15 percent between 1991 and 1993, by 10 percent between 1993 and 1995, by 3 percent between 1995 and 1997, and remained at about the same level between 1997 and 1999<sup>2</sup>. The age and race/ethnic distribution of WIC participants has also changed. Nationally, between 1992 and 1998, the percent of participants who were infants decreased from 30 to 25 percent, while the percent who were children increased from 47 to 51 percent<sup>3</sup>. In NYS, between 1991 and 1998, the percent of participants who were infants decreased from 30 percent to 25 percent, but the percent who were children changed very little, from 51 percent to 53 percent; the proportions that were women increased slightly, from 19 to 22 percent<sup>4</sup>. Nationally, between 1992 and 1996, the proportion of WIC children who were Hispanic rose from 19 to 31, while the proportion of WIC children who were White-non-Hispanic decreased from 46 to 39 and the proportion of WIC children who

were Black-non-Hispanic decreased from 29 to 24 percent<sup>5,6</sup>. Changes in the NYS WIC population followed similar patterns, but were smaller in magnitude. Between 1991 and 1998, the proportion of WIC children who were Hispanic rose from 29 to 32 percent while the proportion of WIC children who were non-Hispanic White and Black decreased from 34 and 30 percent, respectively, to 30 and 29 percent<sup>7</sup>.

Meanwhile, the estimated number of persons in New York eligible for WIC declined since 1990. Long-term demographic projections suggest future population declines, while economic trends indicate future possible poverty increases. Since 1990 in NYS, the annual number of total births and births to teenagers has declined<sup>8</sup>, as has the number of women in the prime reproductive ages<sup>9</sup>. Additional decline in the number of women in prime reproductive ages is expected to occur during the next five years<sup>10</sup>. Thus, it is likely that the number of births will decline as well. Between 1990 and 1999, the number of people in poverty in NYS declined<sup>11</sup>, and between 1990 and July 2001, unemployment also declined<sup>12</sup>. Although there are no projections for poverty, there are projections for U.S. unemployment, which is expected to increase in the next year from 4.6 to 5.2 percent<sup>13</sup>. To the extent that unemployment increases, and poverty increases, the number of people eligible for WIC may also be expected to increase.

In NYS, many children eligible for WIC are not enrolled by their parents/caretakers, and many children who are enrolled subsequently discontinue services. In NYS, for example, among children who were enrolled during the first six months of 1993, 27 percent did not return for their second visit. Of those who returned for a second visit, 26 percent did not return for a third visit<sup>14</sup>. It is unclear why apparently eligible participants fail to take full advantage of the WIC program.

**Purpose and objectives.** This study focused on understanding why parents/caretakers discontinue their infants and children on WIC. The purpose of this study was to identify barriers to retention of infants and children on WIC; that is, to identify barriers that may impede continuing participation by program clients, despite continued eligibility in the WIC program. The study had four specific objectives:

- To identify barriers to retention of infants and children in WIC
- To assess differences in barriers to retention by race/ethnicity and geographic area
- To identify barriers to check usage
- To disseminate results to the WIC, public health and academic communities

## **Background**

The WIC program began as a pilot project in 1972 (PL 92-433). It became a fully authorized grant program in 1974 by amendment to the 1966 Child Nutrition Act (PL 94-105). WIC is a federally funded grant program; it is not an entitlement program. Using a funding formula, FNS allocates cash grants for food benefits and nutrition administration services to 88 state-level agencies (50 states, District of Columbia, Puerto Rico, Samoa, Virgin Islands, Guam and 33 Indian Tribal Organizations). Some states provide additional funds.

At no cost to participants, WIC provides supplemental nutritious foods, nutrition education and health care referrals to low-income women, infants and children up to the age of five. Participants are given vouchers that can be redeemed at WIC approved stores for the purchase of specific nutritious foods. To be eligible for WIC benefits and services, an applicant must (1) be a woman who is pregnant or postpartum, or an infant or a child less than five years old, (2) have an income below 185 percent of federal poverty guidelines, set annually by the Department of Human Services, and (3) be at medical or nutritional risk as verified by a health professional. After they are officially certified as eligible, infants can participate for one year; children (aged 1 through 4) can participate for six months. At the end of each certification period, the participant must be re-certified to continue participating.

## Literature Review

Few studies have addressed barriers to retention among infants and children participating in WIC. The literature review includes, therefore, studies of barriers to access among women participating in WIC, and studies that have identified potential barriers to health care and child care access and use. These studies may shed light on barriers to retention among infants and children receiving WIC benefits and services.

**Barriers to retention.** Little research has focused on participant retention in WIC. Two studies that examined barriers to retaining children in WIC drew contradictory conclusions. One study reported that infants were enrolled in WIC by their families in order to obtain formula for the infants, and that these families left the program when the children were no longer qualified to receive formula<sup>15</sup>. The second study<sup>16</sup> found that the desire to obtain infant formula was the primary reason for enrolling for only five percent of WIC recipients. In this latter study, the main reasons identified for leaving WIC were increased family income, moving out of the area, children aging out (reaching the age five), and difficulties with transportation. Because there have been only two studies, it is difficult to interpret the contradictory results. Differences, however, may be due to sampling variation.

A seminal study by Rush et. al.<sup>17</sup> did not specifically examine barriers to retention among WIC children, but the authors noted that children currently enrolled in WIC and children who left the WIC program were similar in their levels of economic need. The authors also reported that the children who left WIC had a significantly higher proportion who were chronically handicapped than were children retained by the WIC program.

**Barriers to access.** Studies of barriers to access generally report that barriers to prenatal WIC services and prenatal health care are similar. These barriers include lack of information or knowledge about the program and/or its requirements<sup>18,19,20</sup>. Looking only at low-income women, use of prenatal health care services was negatively associated with being a teenager, with having negative attitudes toward health care and health care personnel<sup>21,22</sup> and with lack of support from the father of the child<sup>23</sup>. In addition, lower education and income levels are associated with lower levels of using prenatal services<sup>24,25</sup>. Among WIC eligible women, lower-income women are less likely than higher income woman to be WIC prenatal participants<sup>26</sup>. Thus, low-income women with the fewest economic resources were less likely to participate in the WIC prenatal program than were low-income women with somewhat greater resources.

Lower levels of access to and use of health services in general have been found to be associated with lower income levels, lack of health insurance coverage, competing priorities and lower levels of need<sup>27,28,29</sup>. Appointment scheduling, transportation difficulties, long waits in health care facilities, perceptions that caregivers are unresponsive, and being treated disrespectfully by agency staff have been reported as barriers to use of child health services<sup>30</sup>.

Fragmented, uncoordinated care and lack of training or support for staff have been reported as barriers both to WIC enrollment and participation,<sup>31,32</sup> and to obtaining prenatal health care<sup>33</sup>.

Excessive waiting time has been reported as a barrier to prenatal care<sup>34</sup>. Lack of coordination and integration of services, inadequate resource allocation, excessive waiting time, and difficulties with scheduling and transportation were reported as barriers to use of childcare services<sup>35</sup>.

***Theory of health service use.*** Andersen and others<sup>36,37,38,39</sup> have developed a general theory of service use. Social determinants and health policy influence health service use by individuals both directly and indirectly by affecting the health care delivery system. Primary determinants of health service use are norms (e.g., social norms, health regulations, and legislation) and technology (e.g., medical treatments available). Aspects of the health care delivery system that influence service use include various characteristics of personnel (e.g., numbers of, training), the geographic distribution of services, organizational structure and accessibility of services. Individual determinants of health care use can be classified as predisposing, enabling, and need (e.g., a person's predisposition to use services, ability to secure services, and need or illness level).

Predisposing factors include demographic characteristics (e.g., age, sex, marital status), social structural factors (e.g., education, occupational level, working status, race) and beliefs (e.g., values about health, attitudes about health services, knowledge). They also include other socio-demographic variables such as living situation, poverty level and food insecurity. Enabling factors pertain to the means that individuals have available, including family resources (e.g., income and savings, access to regular source of care) and community characteristics (e.g., price of health services, proximity to sources of care, ratio of health personnel and services to population). Participation in other welfare programs may be considered as an enabling factor, because participation can reflect the person's degree of familiarity with public health and welfare services and bureaucracies. Need refers to health status, which might be measured by the presence of illness (e.g., symptoms), the person's response to illness (going to a doctor), or prevention activities. In Andersen's original formulation,<sup>40</sup> illness level was viewed as the most important factor, and beliefs and community resources were seen as least important, while demographic and family characteristics were of medium importance.

## Methodology

**Potential barriers.** The critical first step in this study was to create a list of potential barriers to retention among infants and children participating in the WIC program. Little research has been conducted on this topic so a wide range of sources was drawn upon in creating this list.

First, a review of the literature included (a) barriers to retaining WIC infants and children; (b) barriers experienced by women in accessing prenatal WIC and prenatal health care services; (c) barriers experienced by children in accessing and using health care services; (d) additional factors potentially influencing health care service use that might act as barriers to use.

Second, we conducted five focus groups. Four with parents/caretakers of currently enrolled infants and children and one focus group with parents/caretakers of previously enrolled infants and children. For persons currently enrolled in WIC, we conducted one focus group with White, non-Hispanic participants (n=11); one with Black, non-Hispanic participants (n=11), one with Hispanic participants (n=6), and one with multi-cultural participants (n=11). The fifth group, consisting of previously enrolled parents/caretakers, was also multi-cultural (10). Parents/caretakers of children who were currently enrolled were recruited in the waiting area at WIC sites by hired contractors. Regional WIC staff and local WIC agency staff recruited previously enrolled participants. A minimum of three attempts was made to telephone each parent/caretaker of children no longer enrolled. This recruitment was extremely difficult and time consuming; the many potential focus group participants simply could not be located. We describe results of the five focus group in another report<sup>41</sup>.

Third, we organized several meetings with an expert guidance team to identify potential barriers to retention in WIC and in other public health programs. The guidance team consisted of the Directors from the NYS DOH Office of Minority Affairs, the Division of Family Health Local Health Unit (DFH) and WIC Operations and Public Affairs. It included staff from the WIC Regional office, Directors from two local WIC agencies, the Director of the NYS Association of WIC Directors and the NYS WIC Training Center as well as a minority community representative and the NYS WIC outreach coordinator.

**Survey instrument<sup>9</sup>.** All potential barriers identified by parents/caretakers in focus groups were included in the survey, since the study goal was to identify and assess barriers to retention from the WIC participants' perspective. Barriers identified from the literature and guidance team discussion relevant to the delivery of WIC services were also included. The survey included demographic and economic information, household information, use of public assistance programs, perceived benefits of WIC, food insecurity and fast food consumption. Outcome information included failure to pick up or cash WIC checks and delaying re-certifying their infant/child. The survey took approximately 15 to 20 minutes to administer person-to-person to parent/caretaker of infants and children enrolled in WIC.

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<sup>9</sup> The survey is available upon request to the NYS Department of Health Division of Nutrition Evaluation and Analysis Unit, 150 Broadway, Albany NY 12204

**Study sample.** Eleven NYS local WIC agencies (51 sites) participated in the study by serving as sites for the selection of focus group participants and then as sites for recruitment of survey respondents. Prior to recruiting WIC agencies, we compiled a list of NYS local WIC agencies eligible to participate. Agencies were selected to ensure adequate representation of race/ethnic and age groups, geographical area (western, north, central, downstate NY), site size and rural and urban location.

Three specific criteria were used to identify agencies eligible for selection. First, the agency had to be large enough to ensure recruitment of at least 100 participants over a three-month period. Second, each of the three major race/ethnic groups had to account for at least ten percent of infants and children served by the agency. Third, each single year of three major age groups (one, two, three and four) had to account for at least ten percent of infants and children served by the agency. From among 99 NYS local WIC agencies, 36 met the required criteria. In 1997, infants and children enrolled in these sites accounted for about 30 percent of statewide WIC infant and children. From this group, agencies were selected to ensure urban and rural and upstate NY and NYC representation while taking into consideration a travel distance that would ensure close site review within budget constraints. Twelve agencies were contacted and 11 agreed to participate. (One agency about to begin implementing a large WIC participation automation project declined to participate). Fifty-one WIC permanent sites within the 11 selected agencies participated. Table 1 presents the geographic location, number of sites and sample size for each of the participating agencies.

| <b>TABLE 1. NUMBER OF PARTICIPATING SITES AND SAMPLE SIZE BY AGENCY</b> |              |                    |
|---|--------------|--------------------|
| <b>Region</b>   | <b>Sites</b> | <b>Sample size</b> |
| <b>New York City</b>  |              |                    |
| Agency 1  | 3            | 226                |
| Agency 2  | 3            | 175                |
| <b>Upstate: Western</b>   |              |                    |
| Agency 3  | 6            | 933                |
| Agency 4  | 6            | 150                |
| Agency 5  | 9            | 507                |
| Agency 6  | 7            | 100                |
| <b>Upstate: Capital district</b>  |              |                    |
| Agency 7  | 4            | 270                |
| Agency 8  | 3            | 203                |
| Agency 9  | 5            | 253                |
| Agency 10   | 1            | 237                |
| Agency 11   | 4            | 113                |
| <b>TOTAL</b>  | <b>51</b>    | <b>3,167</b>       |



## Variables measured

***Outcome variables.*** It was not possible systematically to identify and interview parents/caretakers who had left WIC. Instead, we interviewed current participants and asked whether, during the three months preceding the interview they had “ever missed picking up or cashing checks,” and if they had “ever delayed re-certifying.” These variables represent a participant’s strength of attachment to the WIC program and may be predictive of the probability of leaving the program.

***Demographic and economic variables.*** Background variables included age and race/ethnicity of parent/caretaker and infant/child. In measuring race/ethnicity, we employed the major categories used by the U.S. Census Bureau at the time the survey was conducted: White non-Hispanic; Black non-Hispanic, Hispanic; Asian/Pacific Islander; Native American and Other non-Hispanic. We collected data on work status (full time, part time, unemployed, other); marital status (single, married, widowed, divorced/separated); housing tenure situation (rented, owned, other); education (no formal education, less than 8 years, 8 to 11 years, high school graduate, some college, Bachelors degree or more); and federal poverty level (calculated using family income and family size).

***Food insecurity and fast food consumption variables.*** The extent to which participant families experienced food insecurity was measured by asking: “In the past few months, how often would you say that you and your household did not have enough to eat?” A Likert scale was used, with responses: “No/never, Rarely, Sometimes, Frequently.” An indication of exposure to foods associated with increased risk of cardiovascular and other health problems was obtained by asking how often their child ate fast foods.

***Social support/family issues.*** These variables included problems using WIC because of lack of access to child care, embarrassment, husband/partner’s pride or disapproval, lack of family/friend’s support and other priorities.

***Perceived benefits of WIC.*** Interviewers asked parents/caretakers an open-ended question about what they viewed as the most important benefit of WIC for their infant or child. Parents/caretakers were asked a series of closed-ended questions about the importance of various specific aspects of WIC. These included money saved on grocery bills, formula, knowing WIC food is good, breastfeeding and health information, family eating better, talking with other parents, nutrition information, having blood, height and weight checked and help with staying on time for child’s shots.

***Participation in public assistance programs.*** Participants were asked whether or not they currently participated in each of the following public assistance programs: Medicaid, Temporary Assistance to Needy Families (TANF), Food Stamps, Head Start, free/reduced lunch and Social Security Insurance (SSI). We asked how many household members were enrolled in WIC. From this information, three variables were created: the number of food programs in which household members participated, the number of

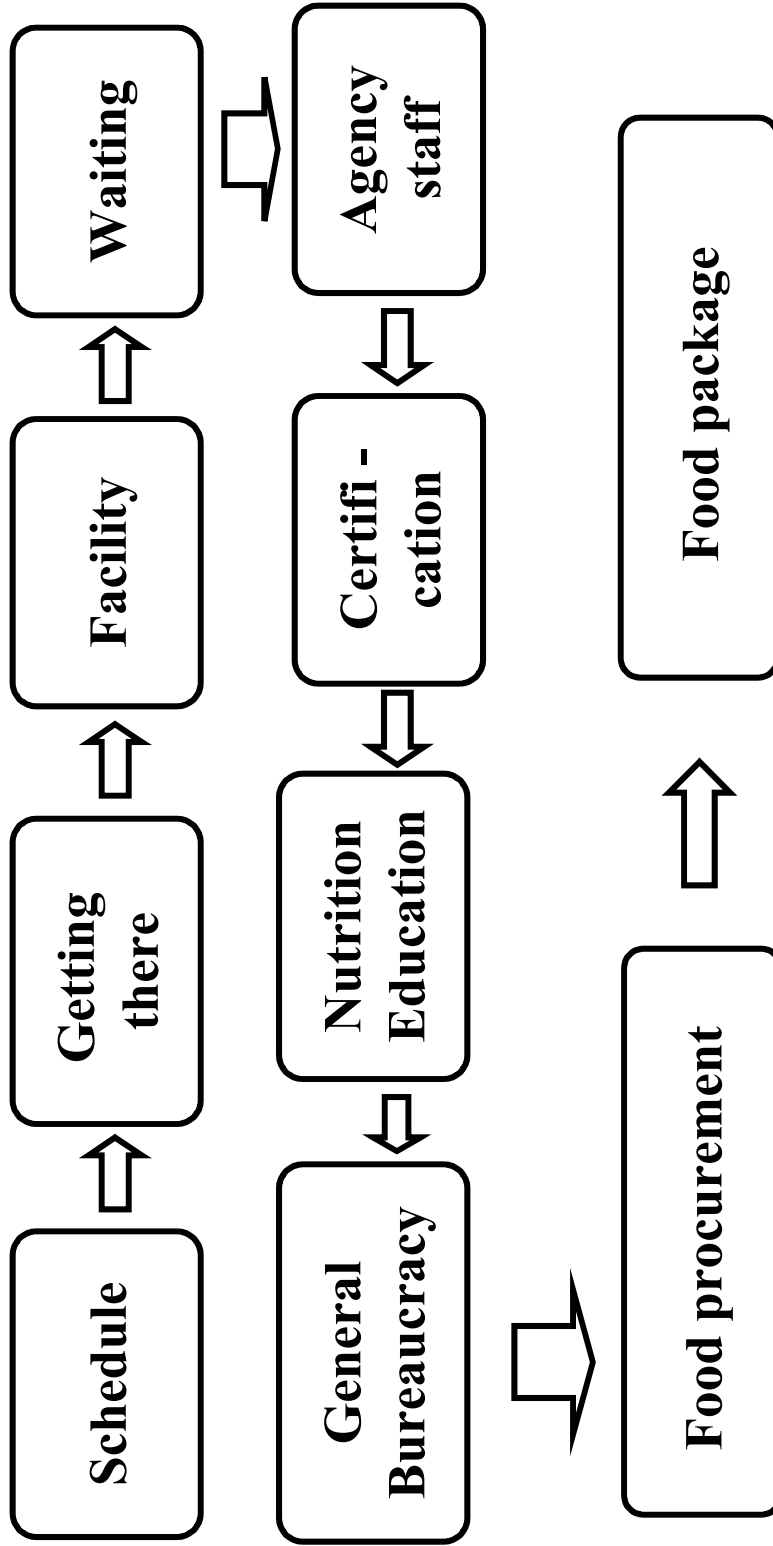
household members enrolled in WIC and the WIC family unit composition (i.e., infants only, child only and child and infant).

***Barriers to retention.*** We collected data on 68 potential barriers (refer Table 6). A subset of these barriers that reflected the temporal flow of events that parents/takers would experience in receiving WIC benefits were organized into categories, beginning with scheduling an appointment and traveling to the WIC office, through exposure to the various bureaucratic processes that occur in the office, to procuring the food at a retail store.

The categories were generated as follows. Each of the 68 potential barriers was written on a slip of paper and given in various random orders to 15 Division of Nutrition, WIC and grant staff. Each was asked to categorize the barriers into 8-12 groups that best described how WIC is organized. The resulting categories were analyzed using target partition analysis<sup>42</sup> to ascertain whether an underlying set of categories could be identified. That is, the goal was to learn if a basic set of categories could be found for which it could be said that different sorters had simply split or combined these ‘latent’ categories in different ways to form their own ‘manifest’ categories. This approach led to the identification of a basic set of ten categories: specifically, it was found that the expert sorters agreed in fundamental ways regarding the placement of potential barrier items within a set of temporal/organizational categories. In the few instances of limited consensus, potential barriers were placed in a category by program and grant project staff. Figure 1 displays results in terms of category names. One category of barriers, ‘social support’ was not included in the figure so this resulted in ten categories.

The individual items pertaining to barriers that parent/caretakers may experience at each stage of the WIC participation process are identified in Table 6 and illustrated in Figure 1.

**Figure 1. Potential barriers in the NYS WIC participation process**



A person was identified as experiencing a barrier if she/he indicated that they encountered the problem sometimes or frequently, or if they were not satisfied with the variety of foods, or if they received too little or too much of a certain food, or waiting more than 1/2 hour to pick up checks or to re-certify. The individual items are defined as follows:

**Scheduling.** Regarding potential barriers in scheduling, participants were asked if they experienced problems because of the days/hours available for appointments, difficulty with getting off work, rescheduling appointments, not being given a specific appointment time, and the requirement that each family member have a separate appointment time.

**Getting there.** Study participants were asked about problems with parking, transportation and WIC site neighborhood safety.

**The facility.** These potential barriers included a crowded or noisy site, unsanitary or unclean site, and lack of activities at the site for children.

**Waiting.** These potential barriers included waiting too long and waiting times for check pick-up and waiting times to re-certify.

**Agency staff.** Potential barriers included staff being customer friendly, negative treatment of clients by agency staff, being given conflicting information, not listening to clients, staff not speaking client's language, race/ethnicity of staff different from client, insensitivity to client culture.

**Re-certification.** Respondents were asked about bringing their infant/child to the WIC site to re-certify, about blood work for their infant/child, paperwork and not allowing the proxy to re-certify the infant or child.

**Nutrition education.** Respondents were asked about nutrition education; whether it was boring, repetitive, useful as well as the length of nutrition education.

**General bureaucracy.** Possible barriers falling in the general bureaucracy category included unclear rules, rigid rules, difficulty getting the food package changed to meet specific dietary needs and difficulty replacing lost/damaged checks.

**Food procurement.** Two types of potential barriers in food procurement were measured on store policy and food availability. Respondents were asked whether stores had policies different from WIC policies, whether they were treated negatively by store staff. They were asked if they had problems with WIC food in stock, finding WIC foods in store, getting all WIC foods, getting the right cereal box size, matching check amount to food container in store and getting the right milk size.

**Food Package.** Two types of barriers pertained to food packages. Respondents were asked about their satisfaction with a variety of foods in their WIC food package, specifically with regard to cereals, juice, cheese, and whether the food was appropriate to their culture. Respondents were asked whether the amount of food they received as a benefit was too little, just enough or too much, specifically with regard to formula, juice, cheese, milk, cereal, eggs, peanut butter and dry beans.

**Constructed variable (total number of barriers).** For each respondent, the *total number of barriers* was constructed by adding the number of times a respondent indicated they encountered the problem Sometimes or Frequently, if they were not satisfied with the variety of foods, or if they received too little of a certain food. Fifty-three barriers were used in calculating the *total number of barriers* experienced (Table 6). Included were barriers that directly related to the WIC participation process either in picking up or in cashing WIC checks. Potential barriers related to receiving too much food were *not* used; other excluded variables pertained to social support (e.g., lack of child care, embarrassment, etc.) that were not used because for this group of barriers 96 percent or more of the survey respondents said they never or rarely had these problems.

**Data collection process.** In order to ensure open, candid, unbiased results, outside contractors were hired to conduct focus groups and to collect survey data. Surveys were administered from March 1999 through December 1999. In compliance with USDA and NYS Institutional Review Board requirements, parents/caretakers were asked to sign an informed consent form prior to participation in the focus groups and prior to the person-to-person interview. Forty-nine parent/caretakers participated in focus groups and 3,300 parent/caretakers began the survey. The survey was completed by 3,167 parent/caretakers.

**Survey response rate and completion rate.** Response rate refers to the proportion of persons invited to participate who agreed to participate. The completion rate refers to the percent of respondents interviewed who completed all survey questions. The overall response rate of 80 percent was lower than it might have been because interviewers were instructed not to interfere with scheduled appointments of WIC participants, and because, during the initial data collection phase, activities were not available for children of respondents. During later interviews, we supplied McDonald toys donated by EAU clerical staff, and crayons and coloring books, a procedure that clearly facilitated parent/caretakers participation in the survey. Once activities were provided to respondents' children, the majority of non-responses were a result of participants being called for their WIC appointment at the time of recruitment. The completion rate was 96 percent; most non-completions occurred when participants were called to receive WIC services during the interview.

**Data cleaning.** For each variable, the distribution of responses was examined for missing, impossible or outlying values and the shape of the distribution. Additional analysis provided the basis for eliminating some variables from consideration (those with no variance), for choosing metrics for particular variables, and for developing variable transformations and scale construction.

To assess the effect of missing values on empirical results, we constructed scales first based on the assumption that missing values meant *there is no* barrier and second based on the assumption that missing values meant *there is* a barrier. A comparison of the two sets of frequency distributions showed minor differences in results across assumptions. Frequencies assuming missing *is* a barrier are, in virtually all cases, within one percentage point of frequencies assuming missing *is not* a barrier. The single exception is barriers in "general bureaucracy," in which the difference was 1.4 percentage points.

**Data analysis.** Tables 2 through 9 present basic descriptive information for each variable measured.

Classification trees were used to identify characteristics or behaviors that work together or interact to predict check usage behavior. Classification trees are flexible, non-parametric tools that often reveal unknown structures in data and that offer model-free results which are straightforward to explain. This is in contrast to many other commonly used statistical methods, such as logistic regression or analysis of variance, which are parametric and entail assumptions about distributions. Trees automatically detect interactions in data. An important feature of classification trees is they are invariant to monotone one-to-one transformations of ordered categorical or continuous independent variables. Thus, ‘outliers’ pose no problems. Trees can handle mixtures of continuous and categorical data. Standard tree software incorporates provisions for handling missing values. Classification trees do not entail construction of equations; they require only a splitting criterion and stopping rule<sup>h</sup>. Finally, classification trees yield graphics that are usually straightforward to interpret and explain.

A classification tree was fitted using binary recursive partitioning whereby data are successively split along coordinate axes of predictor variables so that at any node the split that best predicts the probability of assignment to the target variable (e.g., failure to pick-up or cash WIC checks) is selected. The initial node is called the root. Splitting continues until nodes are relatively pure or data are too sparse. Purity of a node concerns the degree to which observations in that node have homogeneous values for the target variable. The chosen split is one that maximizes “purity” in the daughter nodes. Stopping rules are applied to determine whether each split brings enough improvement for it to be worthy of inclusion in the tree. Trees automatically detect certain interaction effects. An interaction effect is evident if a covariate shows differential predictions of the dependent or response variable only for certain ranges of previously chosen independent variables. Standard regression methodology is rarely able to discern interaction effects that are readily found with trees.

The final tree shows each split and all subsequent splits, until terminal nodes are reached. These terminal nodes, or leaves, constitute the points at which further splits do not improve the model’s overall measure of fit. The tree shows how variables and their values increase or decrease the probability of the outcome as variables are added to the tree. A graphical display is produced that represents the successive partitioning of data to show what variables and values best predict the probability of assignment to categories of the target variable (e.g., failure to pick-up or cash WIC checks). Independent variables remain available even if they have been used earlier in construction of a tree, so it is possible for a single independent variable to reappear at several points in a tree. A tree can be evaluated in part through the use of a *confusion matrix*. Such a matrix provides information about misclassification rates based on estimated probabilities of responses at the terminal nodes of a tree.

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<sup>h</sup> Maximal impurity (Gini index) reduction was used as the splitting rule. The Gini index is one of several measures of impurity of a node. A stopping rule identified that point at which additional variables no longer improved the overall goodness of fit. The stopping rule is used to prevent over fitting of the data (*An Introduction to Recursive Partitioning Using the RPART Routines*. Page 22 by Therneau, T.M. and Atkinson, E.J., Mayo Foundation, Rochester, MN. 1997).

**Limitations of data analysis.** In classification trees, it can happen that a particular split (based on a variable that best discriminates among all units at some stage of building a tree) can mask other important variables. Masking is a potential problem for trees as well as virtually any method of statistical analysis that involves study of interdependent variables, and certain difficulties may arise in interpreting ‘effects’ in the presence of masking. Thus, it may be helpful to consider alternative analyses with certain variables excluded from the data set, or with reclassifications of some independent variables as categorical or ordinal. Not unlike other derived solutions in statistics, interpretation of a tree entails care as well as attention to context and subject matter knowledge.

## Results. Respondent characteristics

As shown in Table 2, 50 percent of respondents were White, non-Hispanic, 30 percent were Black, non-Hispanic, 15 percent were Hispanic and 5 percent were from other race/ethnic non-Hispanic groups. The mean age of respondents was 29 years; ranging in age from 14 to 73 (data not shown). The majority of respondents had at least a high school education (74 percent). Approximately one in four, however, did not graduate from high school. Most were single (56 percent) although a significant percentage were married (35 percent). Forty-four percent reported working full (23 percent) or part time (21 percent), and the majority rented their home (78 percent). Sixty-four percent reported household incomes below 100 percent of poverty. Twenty-eight percent lived in households with incomes below 50 percent of poverty. Ten percent reported that in the past few months, they and other household members sometimes or frequently did not have enough to eat.

The mean household size of survey respondents was 3.7 persons (standard deviation=1.4), with a range of 1 to 14 (data not shown). A majority had one (56 percent) or two persons (33 percent) in their household receiving WIC benefits or services. Twenty-four percent had an infant only on WIC, 16 percent had an infant and at least one child on WIC, and the remaining 60 percent consisted of families with at least one child aged 1 through 4 enrolled in WIC.

Fifty-seven percent of survey respondents were enrolled in Medicaid and 40 percent were enrolled in the Food Stamp Program. Enrollment in other programs varied from 30 percent in TANF to 8 percent in Head Start and 9 percent in SSI. Fifty-one percent participated in one food program; 14 percent participated in three or more food programs.

Slightly more than one in four parents/caretakers (27 percent) reported that their children ate fast foods at least once a week.

**Respondent characteristics by race/ethnicity.** Table 3 indicates that Hispanics were more likely than Black or White respondents to be less than 30 years old (71, 58, 63 percent, respectively) and to have not completed high school (39, 22, 21 percent, respectively). Hispanics were more likely than Black or White respondents to be not employed (47, 32, 33 percent, respectively), rent their homes (91, 85, 70 percent, respectively) and report food insecurity (17, 8, 8 percent, respectively).

Table 3 also shows that more White respondents than Blacks or Hispanics respondents were married (44, 20, 29 percent, respectively) and more White respondents owned their home (22, 10, 5 percent, respectively). Compared to Black and Hispanic respondents, Whites were slightly more likely to have more than one family member on WIC (39, 41, 47 percent, respectively). Compared to Black and Hispanic respondents, White respondents were less likely to live in households with incomes below 50 percent of the poverty threshold (33, 36,



22 percent)<sup>1</sup>. However, Black respondents were more likely to be employed full-time than were White or Hispanic respondents (28, 22, 19 percent, respectively).

Black and Hispanic respondents were more likely than White respondents to receive Food Stamps (48, 52, 33 percent, respectively) and TANF (39, 46, 21 percent, respectively) and receive food from more than one food program (57, 57, 43 percent, respectively).

Hispanic, White and Black respondents did not differ in reporting how often their children eat fast foods (28, 28, 27 percent, respectively).

**Respondent characteristics by geographical area (NYC vs. upstate, NY).** In NYC, most survey respondents were Black (44 percent) or Hispanic (41 percent), whereas in upstate NY the majority of respondents were White (5 percent) (Table 4). NYC respondents were more likely than upstate respondents to have less than a high school degree (32 vs. 23 percent), to be single (63 vs. 54 percent), not employed (54 vs. 33 percent) and rent their home (89 vs. 77 percent). NYC respondents were more likely than upstate respondents to live in households with incomes below 50 percent of the poverty threshold (35 vs. 27 percent) and to report food insecurity (17 vs. 8 percent). NYC respondents compared to upstate NY respondents were more likely to have one person on WIC (66 vs. 55 percent) and receive benefits from one food program (63 vs. 49 percent). NYC respondents were less likely than upstate respondents to receive Medicaid (48 vs. 58 percent), Food Stamps (33 vs. 41 percent), Free/Reduced lunch (10 vs. 19 percent) or Head Start (3 vs. 9 percent).

**Respondent characteristics by WIC family composition.** There were minor differences in respondent characteristics by age of the target child (the oldest child in the family on WIC) There were also minor differences in respondent characteristics for those with one child enrolled in WIC vs. those with more than one enrolled child. Thus, these two groups were combined to create a three-category WIC family composition measure: infant only, one child or children only, and infant and child(ren).

Comparing respondents with an infant only on WIC to other family groups, those with an infant only were younger, more likely to be single, and to receive benefits from one food program. They were less likely to receive benefits from TANF, Food Stamps, Head Start, and Free and Reduced Lunch (Table 5).

**Respondent characteristics by food insecurity.** Ten percent of respondents indicated that in the past few months they Sometimes or Frequently did not have enough to eat. Hispanic respondents were more likely to report food insecurity (17 percent) than White or Black respondents (8 percent each). Compared to upstate NY, a higher percentage of NYC respondents reported food insecurity (8 vs. 17 percent). Further analyses revealed that poverty was associated with food insecurity. Fifteen percent of respondents with incomes below 50 percent poverty level reported food insecurity as compared to 10 percent of respondents with incomes 50 to 100 percent of poverty, and compared to 7 percent with incomes above 100

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<sup>1</sup> Four percent reported living in households with incomes above 185 percent of poverty. This, however, is not inconsistent with eligibility requirements. Survey data were collected on an annual poverty basis. WIC eligibility is based on a participants income at the time of certification. For example, if a person became unemployed, they may be eligible for WIC at that time.

percent of poverty. Respondents who did not graduate from high school were more often food insecure than were high school graduates (13 vs. 8 percent). Food insecurity was reported by 11 percent of renters vs. 5 percent of homeowners and 3 percent of those living with the extended family. Unmarried respondents reported more food insecurity than did married respondents (10 vs. 8 percent). Age of parent/caretaker, age of child, family composition and household size showed no difference.

**Summary of respondent characteristics.** Most parents/caretakers of infants or children on WIC had at least a high school education (74 percent); half were single and about a third were married. Most rented their homes (78 percent) and about two-thirds lived in households with incomes below 100 percent of the federal poverty guidelines. The average household size was 3.7 persons. Many parents/caretakers work full time (23 percent) or part time (21 percent). Eight percent in Upstate and 17 percent in NYC reported that in the past few months they sometimes or frequently did not have enough to eat. The majority (86 percent) of respondents reported participation in one or two food programs.

Hispanic respondents were more likely to be younger, not have a high school education, not be employed and report experiencing food insecurity. White respondents were more likely to be married and own their homes, less likely to live below 50 percent of poverty, receive Food Stamps, TANF, Medicaid or participate in more than one food program.

In Upstate NY, the majority of respondents were White, whereas in NYC the majority of respondents were Black or Hispanic. Compared to upstate NY respondents, NYC respondents were more likely to be receiving benefits from one food program, and more likely to rent, to not be employed, be single and to have not finished high school. NYC respondents were more likely to be in households with incomes below 50 percent of poverty, and more likely to have reported food insecurity; they were also less likely to be receiving Medicaid or Food Stamps than upstate respondents.

**TABLE 2. RESPONDENT CHARACTERISTICS (N=3167)**

| <b>Socio-demographics</b>          |      |       | <b>Household characteristics</b>     |      |       |
|------------------------------------|------|-------|--------------------------------------|------|-------|
| <b>Race/ethnicity of caretaker</b> | n=   | 3,146 | <b>Persons in household</b>          | n=   | 3,167 |
| White non-Hispanic                 | (%)* | 50    | One or two                           | (%)* | 22    |
| Black non-Hispanic                 |      | 30    | Three                                |      | 29    |
| Hispanic                           |      | 15    | Four                                 |      | 24    |
| Other                              |      | 5     | Five or more                         |      | 25    |
| <b>Age of parent/caretaker</b>     | n=   | 3,089 | <b>Persons in household on WIC</b>   | n=   | 3,150 |
| 14 – 19                            | (%)  | 7     | One                                  | (%)  | 56    |
| 20 – 29                            |      | 55    | Two                                  |      | 33    |
| 30 – 39                            |      | 30    | Three or more                        |      | 11    |
| 40 and over                        |      | 8     |                                      |      |       |
| <b>Education</b>                   | n=   | 3,137 | <b>Persons in household under 18</b> | n=   | 3,167 |
| Less than high school graduate     | (%)  | 24    | One                                  | (%)  | 34    |
| High School graduate               |      | 40    | Two                                  |      | 33    |
| Some college                       |      | 30    | Three                                |      | 19    |
| Bachelor or more                   |      | 6     | Four or more                         |      | 13    |
| <b>Marital status</b>              | n=   | 3,142 | <b>WIC family composition</b>        | n=   | 3,165 |
| Single                             | (%)  | 56    | Infant only                          | (%)  | 24    |
| Married                            |      | 35    | Child(ren) only                      |      | 60    |
| Divorced/Separated                 |      | 9     | Both infant and child(ren)           |      | 16    |
| <b>Working status</b>              | n=   | 3,118 | <b>Public assistance programs</b>    | n=   | 3,167 |
| Unemployed                         | (%)  | 35    | Medicaid                             | (%)  | 57    |
| Full-time employee                 |      | 23    | Food Stamps                          |      | 40    |
| Part-time employee                 |      | 21    | TANF                                 |      | 30    |
| Homemaker                          |      | 12    | Free/Reduced Lunch                   |      | 18    |
| Other                              |      | 9     | Child Support Enforcement            |      | 12    |
| <b>Living situation</b>            | n=   | 3,114 | Social Security Insurance            |      | 9     |
| Rent                               | (%)  | 78    | Head Start                           |      | 8     |
| Own                                |      | 15    |                                      |      |       |
| Other                              |      | 6     |                                      |      |       |
| <b>Poverty level</b>               | n=   | 2,868 | <b>Food program participation</b>    | n=   | 3,167 |
| Less than 50%                      | (%)  | 28    | One food program                     | (%)  | 51    |
| 50 to 100%                         |      | 36    | Two food programs                    |      | 35    |
| 101 to 150%                        |      | 25    | Three food programs                  |      | 11    |
| 151 to 185%                        |      | 7     | Four food programs                   |      | 3     |
| Over 185%                          |      | 4     |                                      |      |       |
| <b>Food insecurity</b>             | n=   | 3,120 | <b>Fast food consumption</b>         | n=   | 2,737 |
| Not enough to past few months      | (%)  | 10    | Eat fast foods at least once week    | (%)  | 27    |

\*Please note that due to rounding, percentages may not total 100.

**TABLE 3. RESPONDENT CHARACTERISTICS BY RACE/ETHNICITY**

| <b>Race/ethnicity of parent/caretaker</b> |      | <b>White</b> | <b>Black</b> | <b>Hispanic</b> | <b>Other</b> |
|---|------|--------------|--------------|-----------------|--------------|
| <b>Age of parent/caretaker</b>            | n=   | 1565         | 913          | 442             | 152          |
| 14 – 19                                   | (%)* | 6            | 8            | 10              | 8            |
| 20 – 29                                   |      | 57           | 50           | 61              | 45           |
| 30 and over                               |      | 36           | 42           | 30              | 48           |
| <b>Education</b>                          | n=   | 1574         | 936          | 454             | 157          |
| Less than high school graduate            | (%)  | 21           | 22           | 39              | 22           |
| High School graduate                      |      | 42           | 39           | 34              | 43           |
| Some college                              |      | 30           | 34           | 25              | 25           |
| Bachelor or more                          |      | 7            | 6            | 3               | 10           |
| <b>Marital status</b>                     | n=   | 1579         | 935          | 455             | 156          |
| Single                                    | (%)  | 45           | 73           | 62              | 40           |
| Married                                   |      | 44           | 20           | 29              | 54           |
| Divorced/Separated                        |      | 10           | 6            | 9               | 6            |
| <b>Working status</b>                     | n=   | 1569         | 931          | 445             | 156          |
| Unemployed                                | (%)  | 33           | 32           | 47              | 41           |
| Full-time employee                        |      | 22           | 28           | 19              | 20           |
| Part-time employee                        |      | 22           | 22           | 15              | 17           |
| Homemaker                                 |      | 15           | 8            | 12              | 10           |
| <b>Living situation</b>                   | n=   | 1558         | 926          | 454             | 158          |
| Rent                                      | (%)  | 70           | 85           | 91              | 81           |
| Own                                       |      | 22           | 10           | 5               | 15           |
| <b>Poverty level</b>                      | n=   | 1334         | 91           | 458             | 156          |
| 50% or below                              | (%)  | 22           | 33           | 36              | 29           |
| 51 to 100%                                |      | 37           | 35           | 34              | 40           |
| 101 to 150%                               |      | 28           | 22           | 22              | 23           |
| 151 to 185%                               |      | 8            | 7            | 6               | 6            |
| Over 185%                                 |      | 5            | 4            | 2               | 1            |
| <b>Food insecurity</b>                    | n=   | 1567         | 933          | 449             | 155          |
| Not enough to eat in past 2 months        | (%)  | 8            | 8            | 17              | 8            |
| <b>Persons in household on WIC</b>        | n=   | 1581         | 942          | 451             | 157          |
| One                                       | (%)  | 53           | 61           | 59              | 54           |
| Two                                       |      | 36           | 30           | 32              | 37           |
| Three or more                             |      | 11           | 9            | 9               | 9            |
| <b>WIC family composition</b>             | n=   | 1585         | 944          | 457             | 158          |
| Infant only                               | (%)  | 23           | 25           | 24              | 23           |
| Child(ren) only                           |      | 59           | 62           | 61              | 62           |
| Infant and child(ren)                     |      | 18           | 14           | 15              | 16           |
| <b>Food program participation</b>         | n=   | 1586         | 945          | 457             | 158          |
| One food program                          | (%)  | 57           | 44           | 44              | 56           |
| Two food programs                         |      | 32           | 38           | 42              | 30           |
| Three or more food programs               |      | 11           | 19           | 15              | 14           |
| <b>Public assistance programs</b>         | n=   | 1586         | 945          | 457             | 158          |
| Medicaid                                  | (%)  | 53           | 60           | 64              | 63           |
| TANF                                      |      | 21           | 39           | 46              | 31           |
| Food Stamps                               |      | 33           | 48           | 52              | 41           |
| Head Start                                |      | 8            | 9            | 8               | 5            |
| Free/Reduced Lunch                        |      | 17           | 22           | 15              | 13           |

\*Please note that due to rounding, percentages may not total 100

**TABLE 4. RESPONDENT CHARACTERISTICS BY GEOGRAPHICAL AREA**

|                                    |      | NYC | Upstate |
|------------------------------------|------|-----|---------|
| <b>Race of parent/caretaker*</b>   | n=   | 398 | 2760    |
| White, non-Hispanic                | (%)* | 7   | 57      |
| Black, non-Hispanic                |      | 44  | 28      |
| Hispanic                           |      | 41  | 11      |
| <b>Age of caretaker</b>            | n=   | 368 | 2721    |
| 14 – 19                            | (%)  | 9   | 7       |
| 20 – 29                            |      | 54  | 55      |
| 30 and over                        |      | 38  | 38      |
| <b>Education</b>                   | n=   | 391 | 2746    |
| Less than high school graduate     | (%)  | 32  | 23      |
| High School graduate               |      | 30  | 41      |
| Some college                       |      | 31  | 30      |
| Bachelor or more                   |      | 6   | 6       |
| <b>Marital status</b>              | n=   | 394 | 2748    |
| Single                             | (%)  | 63  | 54      |
| Married                            |      | 28  | 36      |
| Divorced/Separated                 |      | 8   | 9       |
| <b>Working status*</b>             | n=   | 377 | 2741    |
| Unemployed                         | (%)  | 54  | 33      |
| Employed (Full or part time)       |      | 34  | 46      |
| Homemaker                          |      | 6   | 13      |
| <b>Living Situation*</b>           | n=   | 386 | 2728    |
| Rent                               | (%)  | 89  | 77      |
| Own                                |      | 3   | 17      |
| <b>Poverty level</b>               | n=   | 311 | 2557    |
| 50% or below                       | (%)  | 35  | 27      |
| 51 to 100%                         |      | 29  | 37      |
| 101 to 150%                        |      | 29  | 24      |
| 151 to 185%                        |      | 5   | 8       |
| Over 185%                          |      | 3   | 4       |
| <b>Food insecurity</b>             | n=   | 389 | 2731    |
| Not enough to eat in past 2 months | (%)  | 17  | 8       |
| <b>Persons in household on WIC</b> | n=   | 395 | 2755    |
| One                                | (%)  | 66  | 55      |
| Two                                |      | 30  | 34      |
| Three or more                      |      | 5   | 11      |
| <b>WIC family composition</b>      | n=   | 401 | 2764    |
| Infant only                        | (%)  | 30  | 23      |
| Child only                         |      | 58  | 60      |
| Infant and child                   |      | 12  | 17      |
| <b>Food program participation</b>  | n=   | 401 | 2766    |
| One food program                   | (%)  | 63  | 49      |
| Two food programs                  |      | 29  | 36      |
| Three or more food programs        |      | 8   | 15      |
| <b>Public assistance programs</b>  | n=   | 401 | 2766    |
| Medicaid                           | (%)  | 48  | 58      |
| TANF                               |      | 35  | 30      |
| Food Stamps                        |      | 33  | 41      |
| Head Start                         |      | 3   | 9       |
| Free/Reduced Lunch                 |      | 10  | 19      |

\*"Other" category not reported. Some percentages may not add to 100 due to rounding.

**TABLE 5. RESPONDENT CHARACTERISTICS BY WIC FAMILY COMPOSITION**

| WIC participant's family composition |      | Infant only | Child(ren) only | Inf&Child |
|--------------------------------------|------|-------------|-----------------|-----------|
| <b>Race of parent/caretaker*</b>     | n=   | 749         | 1890            | 05        |
| White non-Hispanic                   | (%)* | 49          | 49              | 56        |
| Black non-Hispanic                   |      | 31          | 31              | 26        |
| Hispanic                             |      | 15          | 15              | 13        |
| <b>Age of parent/caretaker</b>       | n=   | 741         | 1846            | 500       |
| 14 – 19                              | (%)  | 16          | 5               | 4         |
| 20 – 29                              |      | 59          | 50              | 67        |
| 30 – 39                              |      | 22          | 34              | 24        |
| 40 and over                          |      | 4           | 11              | 4         |
| <b>Education</b>                     | n=   | 747         | 1883            | 505       |
| Less than high school graduate       | (%)  | 26          | 22              | 26        |
| High School graduate                 |      | 39          | 41              | 37        |
| Some college                         |      | 30          | 30              | 31        |
| Bachelor or more                     |      | 5           | 6               | 5         |
| <b>Marital status</b>                | n=   | 746         | 1889            | 505       |
| Single                               | (%)  | 66          | 54              | 47        |
| Married                              |      | 29          | 35              | 44        |
| Divorced/Separated                   |      | 5           | 10              | 8         |
| <b>Working status*</b>               | n=   | 744         | 1873            | 500       |
| Unemployed                           | (%)  | 40          | 32              | 38        |
| Full-time employee                   |      | 21          | 26              | 18        |
| Part-time employee                   |      | 19          | 23              | 17        |
| Homemaker                            |      | 11          | 11              | 19        |
| <b>Living situation*</b>             | n=   | 735         | 1875            | 502       |
| Rent                                 | (%)  | 79          | 78              | 80        |
| Own                                  |      | 9           | 17              | 16        |
| <b>Poverty level</b>                 | n=   | 652         | 1743            | 471       |
| 50% or below                         | (%)  | 29          | 26              | 31        |
| 51 to 100%                           |      | 32          | 36              | 39        |
| 101 to 150%                          |      | 26          | 26              | 20        |
| 151 to 185%                          |      | 7           | 7               | 7         |
| Over 185%                            |      | 6           | 4               | 3         |
| <b>Food insecurity</b>               | n=   | 742         | 1875            | 501       |
| Not enough to eat in past 2 months   | (%)  | 9           | 10              | 9         |
| <b>Persons in household on WIC</b>   | n=   | 751         | 1890            | 507       |
| One                                  | (%)  | 58          | 70              | 4         |
| Two                                  |      | 41          | 26              | 50        |
| Three or more                        |      | 1           | 4               | 46        |
| <b>Food Program Participation</b>    | n=   | 755         | 1903            | 507       |
| One food program                     | (%)  | 62          | 48              | 43        |
| Two food programs                    |      | 31          | 35              | 40        |
| Three or more food programs          |      | 7           | 17              | 17        |
| <b>Public Assistance Programs</b>    | (%)  | 755         | 1903            | 507       |
| Medicaid                             |      | 56          | 56              | 62        |
| TANF                                 |      | 26          | 31              | 35        |
| Food Stamps                          |      | 33          | 41              | 49        |
| Head Start                           |      | 2           | 10              | 10        |
| Free/Reduced Lunch                   |      | 10          | 21              | 19        |

\*"Other" category not reported. Some percentages may not add to 100 due to rounding.

## Results. Barriers to retention

**Benefits of WIC.** When asked an open-ended question about which WIC benefit they viewed as most important for their infant or child, the most frequent responses were good nutrition (26 percent) and formula (25 percent). Other benefits respondents mentioned were other WIC foods (13 percent) milk (11 percent) and saving money (9 percent). When asked about the importance of specific WIC benefits and services, 83 percent of respondents reported formula as very important and 78 percent reported saving money as very important. Ninety-nine percent of participants reported that they would refer a friend or family member to WIC.

**Outcome variables.** Forty-six percent reported that they sometimes did not cash or pick up all their WIC checks, and 13 percent reported that they had delayed re-certifying their infant or child for a few months.

**Barriers to retention.** As noted above, individual barriers were categorized by consensus among NYS Division of Nutrition nutritionists and operations staff regarding how the WIC participation process is organized. As shown in Figure 2, the essential components of the WIC benefits process as experienced by WIC participants included scheduling appointments, traveling to the site, and signing-in for services. If a review of their application showed they were eligible for WIC, participants were certified, received program information, nutrition education, counseling, and referrals. Then following a dietary and health assessment, a food package is prescribed and food vouchers issued. Participants shop in WIC vendor approved stores for prescribed foods.

A relatively small set of barriers was identified by parents/caretakers of infants/children on WIC: 11 barriers were reported to be Sometimes or Frequently a barrier by more than 20 percent of respondents. These 11 barriers clustered into five categories of the WIC organization process: Waiting, the facility, nutrition education, food procurement and the food package (Figure 2).

The most frequently cited barriers (Table 6) were waiting too long (48 percent), waiting more than one hour to re-certify (27 percent), overcrowded, noisy facilities (36 percent), nothing for children to do in the waiting room (42 percent), boring nutrition education (27 percent), repetitive nutrition education (33 percent). Many respondents reported difficulty matching food container sizes in stores to the designated size on the WIC check (23 percent), not getting the right cereal box size (41 percent), and stores having policies different from WIC (29 percent). Many respondents reported that the WIC benefit provides too little formula (38 percent) or too little juice (27 percent).

**Barriers to retention by race/ethnicity (Table 7).** White, Black, Hispanic and other race/ethnic respondents cited the same 11 barriers as most problematic. The rank order differed, however, across groups. For all race/ethnic groups, the most frequently mentioned barrier was waiting too long. For Blacks and Whites, the next two most frequently mentioned

barriers were not finding the right cereal box size in stores, and the lack of activities for children while waiting in the WIC site. For Hispanics, waiting too long was followed by too little formula and by crowded, noisy waiting rooms.

Among barriers cited less often, there were few statistically significant differences across race/ethnic groups. Black respondents reported difficulty getting off work (19 percent) more often than White (12 percent) or Hispanic (15 percent) respondents. Hispanic respondents more often reported that WIC benefits provided too little milk (19 percent) than White (13 percent) and Black (10 percent) respondents. White respondents reported more often experiencing negative treatment at stores (18 percent) than Black (13 percent) or Hispanic (11 percent) respondents. Problems with safety (6 percent), language (2 percent), and WIC foods inconsistent with culture (6 percent) were reported very infrequently. However, these problems were reported more often by Hispanic respondents than by White or by Black respondents. Among Hispanic respondents, eight percent reported problems with neighborhood safety, seven percent with language difficulties and nine percent with their cultural diet.

**Barriers to retention by geographic area (Table 8).** The 11 most often cited barriers to retention were the same for upstate NY and NYC respondents; however, the rank order differed. A higher percentage of NYC respondents than upstate respondents reported overcrowded, noisy facilities, nothing for kids to do and boring, repetitive nutrition education. Four additional barriers were reported as problematic by more than 20 percent of NYC respondents: nutrition education was too long, not very useful, too little food and lack of cereal variety.

**Barriers to retention by WIC family unit composition (Table 9).** The primary difference in reported barriers by family composition was between parents/caretakers with an infant only in WIC and parents/caretakers with an infant and at least one more child in the household in WIC. Respondents with an infant only in WIC were less likely than respondents with an infant and child(ren) enrolled in WIC to report as problematic a lack of activities for children, waiting too long, waiting more than an hour to re-certify, nutrition education being repetitive, not finding the right cereal box size available in the store, and matching check amounts to food container size. Respondents with an infant only were somewhat more likely than those without an infant to report as problematic receiving too little formula or too much milk, and they were somewhat less likely to report too little cheese as problematic.

**Total number of barriers.** Approximately 3 percent of respondents reported experiencing no barriers, 11 percent reported experiencing one or two barriers and 33 percent reported experiencing three to six barriers. Slightly over half (53%) of respondents experienced seven or more barriers (Figure 3).

**Social support/family issues.** Social support or family issues were rarely reported as barriers to retention (Table 6). Lack of childcare was reported by four percent, embarrassment by three percent, husband/partner's pride or disapproval by two percent, lack of family/friend's support by one percent and other priorities by two percent of respondents. Thus, these barriers were not included in further analysis.



**Figure 2. Barriers to retention identified in the NYS WIC participation process**

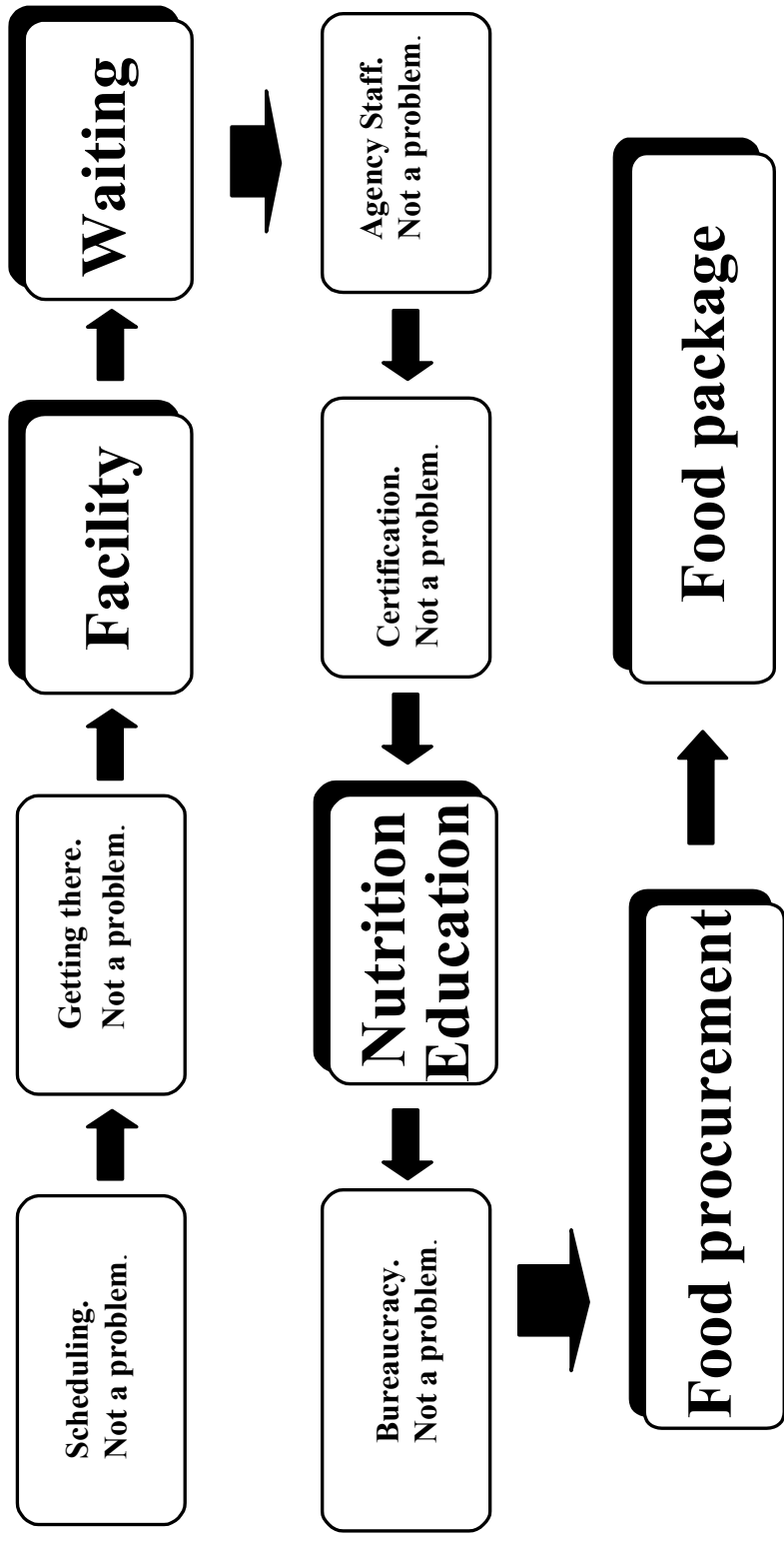
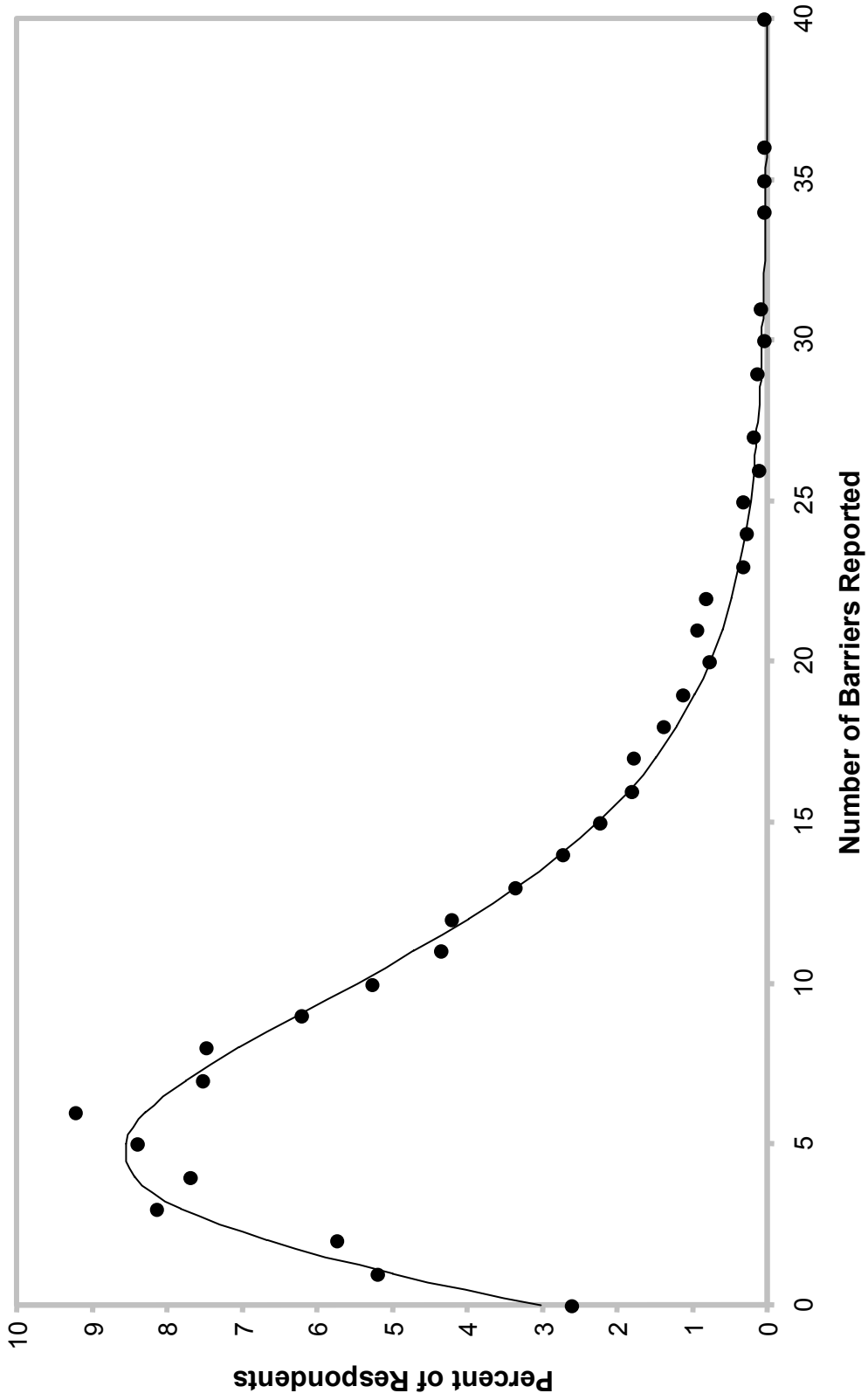


Figure 3. Distribution of number of barriers



**TABLE 6. BARRIERS TO RETENTION AMONG WIC INFANTS AND CHILDREN**

| <b>Access</b>                              |   | <b>Percent of Total Col.</b> | <b>Total (n)</b> |
|--|---|------------------------------|------------------|
| Parking                                    | * | 19                           | 2760             |
| Transportation                             | * | 10                           | 3137             |
| Safety in the neighborhood of the WIC site | * | 5                            | 3117             |
| <b>Local agency facility</b>               |   |                              |                  |
| Lacking activities for the children        | * | 42                           | 3115             |
| Waiting room overcrowded and noisy         | * | 36                           | 3160             |
| Waiting room unsanitary or not clean       | * | 11                           | 3156             |
| <b>Local agency staff</b>                  |   |                              |                  |
| Not being customer friendly                | * | 6                            | 3162             |
| Treating you negatively                    | * | 5                            | 3164             |
| Giving conflicting information             | * | 4                            | 3153             |
| Not listening to you                       | * | 3                            | 3158             |
| Not speaking your language                 | * | 2                            | 3150             |
| Race/ethnicity different than yours        | * | 1                            | 3158             |
| Insensitive to your culture                | * | 1                            | 3151             |
| <b>Scheduling/time issues</b>              |   |                              |                  |
| Wait too long                              | * | 48                           | 3156             |
| Wait more than one hour to recertify       | * | 27                           | 2888             |
| Inconvenient days/hours                    | * | 15                           | 3146             |
| Difficulties getting off work              | * | 15                           | 2726             |
| Rescheduling appointment                   | * | 10                           | 3122             |
| Wait more than one hour to pick up checks  | * | 9                            | 3151             |
| Not given specific appointment time        | * | 4                            | 3123             |
| Family need separate appointments          | * | 4                            | 2711             |
| <b>Operations, rules, regulations</b>      |   |                              |                  |
| Rules too rigid                            | * | 6                            | 3150             |
| Rules unclear                              | * | 5                            | 3157             |
| Getting food package changed               | * | 5                            | 2946             |
| Replacing lost/damaged checks              | * | 5                            | 2853             |
| <b>Recertification</b>                     |   |                              |                  |
| Must bring infant/child                    | * | 17                           | 2846             |
| Too much paperwork                         | * | 14                           | 2875             |
| Infant/child need blood work               | * | 11                           | 2848             |
| Proxy not allowed to recertify             | * | 6                            | 2643             |
| <b>Nutrition education</b>                 |   |                              |                  |
| Repetitive                                 | * | 33                           | 3042             |
| Boring                                     | * | 27                           | 3045             |
| Too long                                   | * | 14                           | 3044             |
| Not very Useful                            | * | 15                           | 3053             |

Continued on next page

**TABLE 6. BARRIERS TO RETENTION AMONG WIC INFANTS AND CHILDREN**

| <b>Procurement (vendor issues)</b>   |   | <b>Percent of Total Col.</b> | <b>Total (n)</b> |
|--|---|------------------------------|------------------|
| Stores have different policies about WIC   | * | 29                           | 3144             |
| Store staff treating you negatively  | * | 16                           | 3145             |
| WIC food not in stock (availability)   | * | 16                           | 3144             |
| Finding WIC foods in the store (availability)  | * | 15                           | 3146             |
| Not getting all WIC foods (availability)   | * | 9                            | 3141             |
| <b>Procurement (package size availability)</b>   |   |                              |                  |
| Not getting right cereal box size  | * | 41                           | 3139             |
| Matching check amount to food container in store   | * | 23                           | 3139             |
| Not getting right milk size  | * | 10                           | 3134             |
| <b>Food variety</b>  |   |                              |                  |
| Variety of cereals   | * | 18                           | 3111             |
| Not culturally appropriate (Hispanic only)   | * | 10                           | 427              |
| Variety of juice   | * | 8                            | 3121             |
| Not culturally appropriate (Non-whites only)   |   | 7                            | 2618             |
| Variety of cheese  | * | 5                            | 3033             |
| <b>Food quantity (too little)</b>  |   |                              |                  |
| Too little formula   | * | 38                           | 2941             |
| Too little juice   | * | 27                           | 3083             |
| Too little cheese  | * | 18                           | 2892             |
| Too little milk  | * | 13                           | 2941             |
| Too little cereal  | * | 12                           | 3057             |
| Too little eggs  | * | 10                           | 2937             |
| Too little peanut butter   | * | 9                            | 2750             |
| Too little dry beans   | * | 7                            | 2030             |
| <b>Food quantity (too much)</b>  |   |                              |                  |
| Too much peanut butter   |   | 16                           | 2750             |
| Too much eggs  |   | 14                           | 2937             |
| Too much milk  |   | 13                           | 2941             |
| Too much dry beans   |   | 13                           | 2030             |
| Too much cereal  |   | 13                           | 3057             |
| Too much cheese  |   | 5                            | 2892             |
| Too much juice   |   | 4                            | 3083             |
| Too much baby formula  |   | 4                            | 2941             |
| <b>Family issues</b>   |   |                              |                  |
| Being employed makes it difficult to use WIC   |   | 13                           | 2289             |
| Lack of child care   |   | 4                            | 3135             |
| Embarrassed using WIC  |   | 3                            | 3152             |
| Husband/partner pride/disapproval  |   | 2                            | 3086             |
| Other priorities   |   | 2                            | 3133             |
| Lack of family/friends support   |   | 1                            | 3139             |
| * Barriers marked with asterisk included in variable <i>Total number of barriers</i> (n=53). |   |                              |                  |

**TABLE 7. BARRIERS TO RETENTION BY RACE/ETHNICITY**

| Race of caretaker                          | Percent of total column |       |          |       | Total number of respondents |       |          |       |
|--|-------------------------|-------|----------|-------|-----------------------------|-------|----------|-------|
|  | White                   | Black | Hispanic | Other | White                       | Black | Hispanic | Other |
| <b>Access</b>                              |                         |       |          |       |                             |       |          |       |
| Parking                                    | 20                      | 18    | 19       | 24    | 1513                        | 767   | 332      | 129   |
| Transportation                             | 8                       | 11    | 14       | 12    | 1581                        | 933   | 446      | 157   |
| Safety in the neighborhood of the WIC site | 5                       | 3     | 8        | 6     | 1575                        | 926   | 439      | 157   |
| <b>Local agency facility</b>               |                         |       |          |       |                             |       |          |       |
| Lacking activities for the children        | 40                      | 50    | 39       | 40    | 1567                        | 928   | 446      | 154   |
| Waiting room overcrowded and noisy         | 32                      | 40    | 41       | 32    | 1586                        | 943   | 452      | 158   |
| Waiting room unsanitary or not clean       | 10                      | 11    | 14       | 16    | 1586                        | 942   | 449      | 158   |
| <b>Local agency staff</b>                  |                         |       |          |       |                             |       |          |       |
| Not being customer friendly                | 7                       | 7     | 6        | 1     | 1586                        | 945   | 453      | 157   |
| Treating you negatively                    | 5                       | 5     | 5        | 2     | 1585                        | 945   | 455      | 158   |
| Giving conflicting information             | 4                       | 5     | 3        | 4     | 1583                        | 942   | 453      | 154   |
| Not listening to you                       | 3                       | 4     | 4        | 1     | 1583                        | 942   | 455      | 157   |
| Not speaking your language                 | 1                       | 0     | 7        | 6     | 1582                        | 939   | 451      | 157   |
| Race/ethnicity different than yours        | 0                       | 1     | 1        | 1     | 1585                        | 941   | 454      | 157   |
| Insensitive to your culture                | 1                       | 1     | 1        | 1     | 1583                        | 939   | 451      | 157   |
| <b>Scheduling/time issues</b>              |                         |       |          |       |                             |       |          |       |
| Wait too long                              | 47                      | 49    | 47       | 53    | 1583                        | 940   | 454      | 158   |
| Wait more than one hour to recertify       | 25                      | 27    | 36       | 29    | 1422                        | 876   | 429      | 143   |
| Inconvenient days/hours                    | 14                      | 17    | 15       | 19    | 1576                        | 938   | 453      | 158   |
| Difficulties getting off work              | 12                      | 19    | 14       | 18    | 1432                        | 791   | 356      | 127   |
| Rescheduling appointment                   | 9                       | 12    | 11       | 13    | 1564                        | 933   | 450      | 154   |
| Wait more than one hour to pick up checks  | 6                       | 10    | 14       | 13    | 1575                        | 942   | 456      | 158   |
| Not given specific appointment time        | 3                       | 4     | 5        | 6     | 1577                        | 927   | 443      | 155   |
| Family need separate appointments          | 5                       | 2     | 4        | 8     | 1440                        | 757   | 373      | 120   |
| <b>Operations, rules, regulations</b>      |                         |       |          |       |                             |       |          |       |
| Rules too rigid                            | 6                       | 6     | 6        | 5     | 1583                        | 940   | 450      | 157   |
| Rules unclear                              | 5                       | 4     | 4        | 3     | 1584                        | 943   | 452      | 157   |
| Getting food package changed               | 5                       | 5     | 5        | 3     | 1481                        | 883   | 417      | 146   |
| Replacing lost/damaged checks              | 3                       | 6     | 5        | 9     | 1428                        | 860   | 402      | 144   |
| <b>Recertification</b>                     |                         |       |          |       |                             |       |          |       |
| Must bring infant/child                    | 15                      | 18    | 21       | 19    | 1162                        | 691   | 336      | 118   |
| Too much paperwork                         | 12                      | 17    | 17       | 17    | 1170                        | 693   | 338      | 119   |
| Infant/child need blood work               | 11                      | 12    | 10       | 14    | 1168                        | 693   | 334      | 118   |
| Proxy not allowed to recertify             | 6                       | 8     | 6        | 4     | 1108                        | 637   | 292      | 97    |
| <b>Nutrition education</b>                 |                         |       |          |       |                             |       |          |       |
| Repetitive                                 | 34                      | 33    | 30       | 28    | 1549                        | 918   | 417      | 139   |
| Boring                                     | 27                      | 27    | 25       | 24    | 1549                        | 917   | 421      | 139   |
| Too long                                   | 13                      | 15    | 16       | 10    | 1551                        | 917   | 418      | 139   |
| Not very Useful                            | 14                      | 15    | 16       | 14    | 1550                        | 922   | 422      | 140   |

Continued on next page

**TABLE 7. BARRIERS TO RETENTION BY RACE/ETHNICITY**

| Race of caretaker                                | Percent of total column |       |          |       | Total number of respondents |       |          |       |
|--|-------------------------|-------|----------|-------|-----------------------------|-------|----------|-------|
|  | White                   | Black | Hispanic | Other | White                       | Black | Hispanic | Other |
| <b>Food procurement</b>                          |                         |       |          |       |                             |       |          |       |
| Stores having different WIC policies             | 28                      | 35    | 25       | 28    | 1582                        | 935   | 450      | 156   |
| Negative treatment by store staff                | 18                      | 13    | 11       | 15    | 1577                        | 939   | 451      | 157   |
| WIC food not in stock (availability)             | 17                      | 15    | 15       | 16    | 1581                        | 938   | 447      | 158   |
| Difficulty finding WIC foods (availability)      | 15                      | 15    | 14       | 18    | 1580                        | 938   | 449      | 158   |
| Not getting all WIC foods (availability)         | 8                       | 10    | 8        | 8     | 1582                        | 937   | 445      | 157   |
| <b>Package size availability</b>                 |                         |       |          |       |                             |       |          |       |
| Not getting right cereal box size                | 43                      | 39    | 36       | 45    | 1580                        | 936   | 445      | 157   |
| Matching check amount to food container in store | 24                      | 22    | 17       | 26    | 1577                        | 939   | 447      | 156   |
| Not getting right milk size                      | 10                      | 10    | 11       | 13    | 1574                        | 936   | 446      | 157   |
| <b>Food variety</b>                              |                         |       |          |       |                             |       |          |       |
| Variety of breakfast cereals                     | 17                      | 21    | 16       | 21    | 1567                        | 923   | 446      | 156   |
| Not consistent with traditional diet             | 3                       | 6     | 9        | 12    | 1555                        | 893   | 427      | 150   |
| Variety of juice                                 | 7                       | 10    | 7        | 8     | 1572                        | 924   | 448      | 157   |
| Variety of cheese                                | 4                       | 7     | 6        | 5     | 1534                        | 891   | 435      | 154   |
| <b>Food quantity (too little)</b>                |                         |       |          |       |                             |       |          |       |
| Too little infant formula                        | 38                      | 37    | 44       | 35    | 868                         | 471   | 230      | 71    |
| Too little juice                                 | 25                      | 29    | 26       | 27    | 1553                        | 913   | 442      | 154   |
| Too little cheese                                | 18                      | 21    | 14       | 19    | 1474                        | 835   | 422      | 142   |
| Too little milk                                  | 13                      | 10    | 19       | 20    | 1481                        | 861   | 430      | 149   |
| Too little breakfast cereal                      | 12                      | 13    | 12       | 11    | 1543                        | 905   | 440      | 150   |
| Too little eggs                                  | 8                       | 12    | 12       | 18    | 1491                        | 854   | 425      | 147   |
| Too little peanut butter                         | 10                      | 9     | 7        | 8     | 1407                        | 814   | 380      | 133   |
| Too little dried beans                           | 4                       | 9     | 9        | 15    | 813                         | 738   | 360      | 108   |
| <b>Food quantity (too much)</b>                  |                         |       |          |       |                             |       |          |       |
| Too much peanut butter                           | 18                      | 12    | 17       | 14    | 1407                        | 814   | 380      | 133   |
| Too much eggs                                    | 20                      | 8     | 6        | 8     | 1491                        | 854   | 425      | 147   |
| Too much milk                                    | 12                      | 16    | 8        | 11    | 1481                        | 861   | 430      | 149   |
| Too much dried beans                             | 18                      | 10    | 9        | 12    | 813                         | 738   | 360      | 108   |
| Too much breakfast cereal                        | 16                      | 8     | 9        | 11    | 1543                        | 905   | 440      | 150   |
| Too much cheese                                  | 5                       | 4     | 5        | 6     | 1474                        | 835   | 422      | 142   |
| Too much juice                                   | 5                       | 2     | 2        | 3     | 1553                        | 913   | 442      | 154   |
| Too much infant formula                          | 5                       | 2     | 2        | 1     | 868                         | 471   | 230      | 71    |
| <b>Family issues</b>                             |                         |       |          |       |                             |       |          |       |
| Being employed makes it difficult                | 12                      | 13    | 14       | 16    | 1206                        | 702   | 266      | 101   |
| Lack of child care                               | 3                       | 3     | 5        | 6     | 1581                        | 933   | 444      | 156   |
| Embarrassed using WIC                            | 4                       | 1     | 3        | 3     | 1584                        | 936   | 454      | 157   |
| Husband/partner pride/disapproval                | 3                       | 1     | 1        | 0     | 1552                        | 919   | 442      | 152   |
| Other priorities                                 | 3                       | 3     | 1        | 3     | 1580                        | 930   | 454      | 148   |
| Lack of family/friends support                   | 1                       | 1     | 2        | 1     | 1580                        | 933   | 450      | 155   |

**TABLE 8. BARRIERS TO RETENTION BY GEOGRAPHICAL AREA (NYC/UPSTATE)**

|  | Percent of total respondents |         | Total respondents |         |
|--|------------------------------|---------|-------------------|---------|
|  | NYC                          | Upstate | NYC               | Upstate |
| <b>Access</b>                              |                              |         |                   |         |
| Parking                                    | 20                           | 19      | 210               | 2550    |
| Transportation                             | 15                           | 9       | 390               | 2747    |
| Safety in the neighborhood of the WIC site | 5                            | 5       | 375               | 2742    |
| <b>Local agency facility</b>               |                              |         |                   |         |
| Lacking activities for the children        | 62                           | 40      | 374               | 2741    |
| Waiting room overcrowded and noisy         | 44                           | 34      | 394               | 2766    |
| Waiting room unsanitary or not clean       | 5                            | 12      | 391               | 2765    |
| <b>Local agency staff</b>                  |                              |         |                   |         |
| Not being customer friendly                | 8                            | 6       | 396               | 2766    |
| Treating you negatively                    | 6                            | 5       | 399               | 2765    |
| Giving conflicting information             | 5                            | 4       | 392               | 2761    |
| Not listening to you                       | 5                            | 3       | 397               | 2761    |
| Not speaking your language                 | 6                            | 1       | 390               | 2760    |
| Race/ethnicity different than yours        | 3                            | 0       | 395               | 2763    |
| Insensitive to your culture                | 1                            | 1       | 390               | 2761    |
| <b>Scheduling/time issues</b>              |                              |         |                   |         |
| Wait too long                              | 41                           | 49      | 393               | 2763    |
| Wait more than one hour to re-certify      | 39                           | 26      | 379               | 2509    |
| Inconvenient days/hours                    | 18                           | 15      | 396               | 2750    |
| Difficulties getting off work              | 16                           | 14      | 316               | 2410    |
| Rescheduling appointment                   | 11                           | 10      | 390               | 2732    |
| Wait more than one hour to pick up checks  | 11                           | 8       | 397               | 2754    |
| Not given specific appointment time        | 6                            | 4       | 378               | 2745    |
| Family need separate appointments          | 6                            | 4       | 305               | 2406    |
| <b>Operations, rules, regulations</b>      |                              |         |                   |         |
| Rules too rigid                            | 8                            | 6       | 391               | 2759    |
| Rules unclear                              | 4                            | 5       | 394               | 2763    |
| Getting food package changed               | 8                            | 4       | 333               | 2613    |
| Replacing lost/damaged checks              | 8                            | 4       | 314               | 2539    |
| <b>Recertification</b>                     |                              |         |                   |         |
| Must bring infant/child                    | 22                           | 15      | 364               | 2482    |
| Too much paperwork                         | 21                           | 13      | 369               | 2506    |
| Infant/child need blood work               | 16                           | 9       | 362               | 2486    |
| Proxy not allowed to re-certify            | 13                           | 5       | 288               | 2355    |
| <b>Nutrition education</b>                 |                              |         |                   |         |
| Repetitive                                 | 44                           | 32      | 322               | 2720    |
| Boring                                     | 40                           | 25      | 321               | 2724    |
| Too long                                   | 27                           | 12      | 319               | 2725    |
| Not Very Useful                            | 29                           | 13      | 331               | 2722    |

Continued on next page

**TABLE 8. BARRIERS TO RETENTION BY GEOGRAPHICAL AREA (NYC/UPSTATE)**

|   | Percent of total respondents |         | Total respondents |         |
|---|------------------------------|---------|-------------------|---------|
|   | NYC                          | Upstate | NYC               | Upstate |
| <b>Food procurement-vendor issues</b>               |                              |         |                   |         |
| Stores having different WIC policies                | 25                           | 30      | 384               | 2760    |
| Negative treatment by store staff                   | 11                           | 16      | 388               | 2757    |
| WIC food not in stock (availability)                | 13                           | 17      | 386               | 2758    |
| Difficulty finding WIC foods (availability)         | 11                           | 16      | 387               | 2759    |
| Not getting all WIC foods (availability)            | 10                           | 8       | 382               | 2759    |
| <b>Food procurement-package size (availability)</b> |                              |         |                   |         |
| Not getting right cereal box size                   | 36                           | 41      | 383               | 2756    |
| Matching check amount to food container             | 23                           | 23      | 390               | 2749    |
| Not getting right milk size                         | 9                            | 11      | 383               | 2751    |
| <b>Food variety</b>                                 |                              |         |                   |         |
| Variety of cereals                                  | 28                           | 17      | 381               | 2730    |
| Not consistent with traditional diet                | 17                           | 4       | 334               | 2711    |
| Variety of juice                                    | 19                           | 6       | 385               | 2736    |
| Variety of cheese                                   | 11                           | 4       | 365               | 2668    |
| <b>Food quantity (too little)</b>                   |                              |         |                   |         |
| Too little formula                                  | 42                           | 38      | 360               | 2581    |
| Too little juice                                    | 35                           | 25      | 374               | 2709    |
| Too little cheese                                   | 23                           | 18      | 346               | 2546    |
| Too little milk                                     | 20                           | 12      | 360               | 2581    |
| Too little cereal                                   | 18                           | 12      | 367               | 2690    |
| Too little eggs                                     | 16                           | 9       | 352               | 2585    |
| Too little peanut butter                            | 11                           | 9       | 301               | 2449    |
| Too little dry beans                                | 16                           | 6       | 309               | 1721    |
| <b>Food quantity (too much)</b>                     |                              |         |                   |         |
| Too much peanut butter                              | 10                           | 17      | 301               | 2449    |
| Too much eggs                                       | 7                            | 15      | 352               | 2585    |
| Too much milk                                       | 13                           | 13      | 360               | 2581    |
| Too much dry beans                                  | 5                            | 14      | 309               | 1721    |
| Too much cereal                                     | 5                            | 13      | 367               | 2690    |
| Too much cheese                                     | 3                            | 5       | 346               | 2546    |
| Too much juice                                      | 2                            | 4       | 374               | 2709    |
| Too much formula                                    | 2                            | 4       | 360               | 2581    |
| <b>Family issues</b>                                |                              |         |                   |         |
| Employment makes it difficult to use WIC            | 17                           | 12      | 190               | 2099    |
| Lack of child care                                  | 9                            | 3       | 375               | 2760    |
| Embarrassed using WIC                               | 3                            | 3       | 388               | 2764    |
| Husband/partner pride/disapproval                   | 3                            | 2       | 367               | 2719    |
| Other priorities                                    | 1                            | 3       | 377               | 2756    |
| Lack of family/friends support                      | 1                            | 1       | 383               | 2756    |



| <b>TABLE 9 BARRIERS TO RETENTION BY WIC PARTICIPANT'S FAMILY COMPOSITION</b> |                                     |              |                   |                          |              |                   |
|--|-------------------------------------|--------------|-------------------|--------------------------|--------------|-------------------|
| <b>WIC participant's family composition</b>                                  | <b>Percent of total respondents</b> |              |                   | <b>Total respondents</b> |              |                   |
| <b>Access</b>  | <b>Infant</b>                       | <b>Child</b> | <b>Inf&amp;Ch</b> | <b>Infant</b>            | <b>Child</b> | <b>Inf&amp;Ch</b> |
| Parking  | 18                                  | 20           | 20                | 658                      | 1657         | 443               |
| Transportation   | 11                                  | 9            | 10                | 749                      | 1885         | 501               |
| Safety in neighborhood of the WIC site                                       | 4                                   | 5            | 5                 | 743                      | 1874         | 498               |
| <b>Local agency facility</b>   |                                     |              |                   |                          |              |                   |
| Lacking activities for the children  | 36                                  | 44           | 45                | 731                      | 1885         | 497               |
| Waiting room overcrowded and noisy   | 35                                  | 36           | 35                | 754                      | 1897         | 507               |
| Waiting room unsanitary or not clean   | 12                                  | 11           | 11                | 752                      | 1896         | 506               |
| <b>Local agency staff</b>  |                                     |              |                   |                          |              |                   |
| Not being customer friendly  | 7                                   | 6            | 7                 | 752                      | 1901         | 507               |
| Treating you negatively  | 5                                   | 5            | 5                 | 753                      | 1902         | 507               |
| Giving conflicting information   | 5                                   | 4            | 6                 | 751                      | 1894         | 506               |
| Not listening to you   | 4                                   | 3            | 4                 | 753                      | 1897         | 506               |
| Not speaking your language   | 2                                   | 2            | 1                 | 752                      | 1891         | 505               |
| Race/ethnicity different than yours  | 1                                   | 1            | 0                 | 753                      | 1897         | 506               |
| Insensitive to your culture  | 1                                   | 1            | 1                 | 752                      | 1893         | 504               |
| <b>Scheduling/time issues</b>  |                                     |              |                   |                          |              |                   |
| Wait too long  | 42                                  | 49           | 52                | 752                      | 1895         | 507               |
| Wait more than one hour to recertify   | 23                                  | 28           | 29                | 552                      | 1854         | 481               |
| Inconvenient days/hours  | 15                                  | 15           | 17                | 747                      | 1891         | 506               |
| Difficulties getting off work  | 12                                  | 15           | 16                | 646                      | 1664         | 414               |
| Rescheduling appointment   | 11                                  | 10           | 10                | 737                      | 1878         | 505               |
| Waiting more than 1 hour for checks  | 9                                   | 9            | 9                 | 747                      | 1897         | 505               |
| Not given specific appointment time  | 5                                   | 4            | 3                 | 740                      | 1881         | 500               |
| Family need separate appointments  | 2                                   | 4            | 7                 | 612                      | 1606         | 491               |
| <b>Operations, rules, regulations</b>  |                                     |              |                   |                          |              |                   |
| Rules too rigid  | 6                                   | 7            | 6                 | 750                      | 1892         | 506               |
| Rules unclear  | 5                                   | 4            | 5                 | 753                      | 1896         | 506               |
| Getting food package changed   | 4                                   | 5            | 4                 | 684                      | 1776         | 485               |
| Replacing lost/damaged checks  | 4                                   | 5            | 4                 | 667                      | 1721         | 463               |
| <b>Recertification</b>   |                                     |              |                   |                          |              |                   |
| Must bring infant/child  | N/A                                 | 17           | 17                | 0                        | 1837         | 485               |
| Too much paperwork   | N/A                                 | 15           | 14                | 0                        | 1848         | 487               |
| Infant/child need blood work   | N/A                                 | 12           | 9                 | 0                        | 1844         | 484               |
| Proxy not allowed to recertify   | N/A                                 | 7            | 5                 | 0                        | 1687         | 461               |
| <b>Nutrition education</b>   |                                     |              |                   |                          |              |                   |
| Repetitive   | 28                                  | 35           | 34                | 695                      | 1848         | 497               |
| Boring   | 25                                  | 27           | 26                | 697                      | 1851         | 495               |
| Too long   | 11                                  | 15           | 13                | 695                      | 1850         | 497               |
| Not very useful  | 13                                  | 15           | 15                | 701                      | 1852         | 498               |

Continued on next page

**TABLE 9. BARRIERS TO RETENTION BY WIC PARTICIPANT'S FAMILY COMPOSITION**

| WIC participant's family composition | Percent of total respondents |       |        | Total respondents |       |        |
|--------------------------------------|------------------------------|-------|--------|-------------------|-------|--------|
|                                      | Infant                       | Child | Inf&Ch | Infant            | Child | Inf&Ch |
| <b>Food procurement</b>              |                              |       |        |                   |       |        |
| Stores having different WIC policies | 26                           | 30    | 31     | 748               | 1889  | 505    |
| Negative treatment by store staff    | 15                           | 16    | 14     | 749               | 1889  | 505    |
| WIC food not in stock                | 18                           | 15    | 19     | 748               | 1891  | 503    |
| Difficulty finding WIC foods         | 15                           | 15    | 16     | 749               | 1890  | 505    |
| Not getting all WIC foods            | 9                            | 9     | 7      | 746               | 1889  | 504    |
| <b>Package size availability</b>     |                              |       |        |                   |       |        |
| Not getting right cereal box size    | 32                           | 44    | 43     | 736               | 1896  | 505    |
| Matching check to food container     | 18                           | 25    | 23     | 746               | 1887  | 504    |
| Not getting right milk size          | 12                           | 10    | 10     | 736               | 1891  | 505    |
| <b>Food variety</b>                  |                              |       |        |                   |       |        |
| Variety of breakfast cereals         | 17                           | 19    | 18     | 717               | 1888  | 504    |
| Not consistent with traditional diet | 7                            | 5     | 6      | 715               | 1834  | 494    |
| Variety of juice                     | 8                            | 8     | 8      | 724               | 1889  | 506    |
| Variety of cheese                    | 5                            | 5     | 4      | 681               | 1851  | 500    |
| <b>Food quantity (too little)</b>    |                              |       |        |                   |       |        |
| Too little infant formula            | 40                           | 35    | 40     | 640               | 581   | 428    |
| Too little juice                     | 24                           | 29    | 22     | 697               | 1883  | 501    |
| Too little cheese                    | 12                           | 21    | 15     | 598               | 1800  | 493    |
| Too little milk                      | 6                            | 16    | 9      | 604               | 1840  | 496    |
| Too little breakfast cereal          | 12                           | 13    | 11     | 679               | 1875  | 501    |
| Too little eggs                      | 6                            | 12    | 8      | 601               | 1842  | 493    |
| Too little peanut butter             | 8                            | 10    | 9      | 527               | 1749  | 474    |
| Too little dried beans               | 6                            | 8     | 7      | 382               | 1305  | 343    |
| <b>Food quantity (too much)</b>      |                              |       |        |                   |       |        |
| Too much peanut butter               | 15                           | 16    | 19     | 527               | 1749  | 474    |
| Too much eggs                        | 14                           | 12    | 21     | 601               | 1842  | 493    |
| Too much milk                        | 20                           | 9     | 16     | 604               | 1840  | 496    |
| Too much dried beans                 | 13                           | 12    | 16     | 382               | 1305  | 343    |
| Too much breakfast cereal            | 12                           | 12    | 15     | 679               | 1875  | 501    |
| Too much cheese                      | 7                            | 4     | 5      | 598               | 1800  | 493    |
| Too much juice                       | 5                            | 3     | 5      | 697               | 1883  | 501    |
| Too much infant formula              | 3                            | 5     | 3      | 640               | 581   | 428    |
| <b>Family issues</b>                 |                              |       |        |                   |       |        |
| Employed makes WIC difficult to use  | 13                           | 13    | 12     | 506               | 1432  | 350    |
| Lack of child care                   | 3                            | 4     | 6      | 742               | 1888  | 503    |
| Embarrassed using WIC                | 3                            | 4     | 2      | 750               | 1894  | 506    |
| Husband/partner pride/disapproval    | 1                            | 2     | 2      | 733               | 1852  | 499    |
| Other priorities                     | 1                            | 3     | 3      | 744               | 1883  | 504    |
| Lack of family/friends support       | 0                            | 1     | 1      | 747               | 1885  | 505    |

## Results. Barriers to check usage

Using classification tree analysis, this section attempts to identify variables predictive of failure to use WIC checks. Participants who failed to use all their WIC checks, through failure to pick-up or cash checks, did not fully participate in the WIC Program. As previously noted, 46 percent of survey respondents reported that they had failed to pick-up or cash WIC checks. Seventy-one variables were included in the classification tree as potential predictors. These variables included socio-demographic and economic information, number and composition of family on WIC, agency/site of services, temporary vs. permanent site, size of site, before vs. after WIC automation and 57 barriers to retention, which included the constructed variables, *total number of barriers* and *total number of categories of barriers*. Barriers that were reported by few respondents were excluded from the analysis. Table 10 contains a complete list of all independent variables included in the classification tree.

As shown in Figure 4, results indicated that the constructed variable, *total number of barriers* was most predictive of failure to use WIC checks. Of 1,717 respondents who reported seven or fewer barriers, 37 percent said they sometimes or frequently failed to pick-up or cash WIC checks, compared to 57 percent of 1,444 respondents who reported experiencing eight or more barriers.

Among respondents experiencing seven or fewer barriers, no other variable led to a notable improvement in predicting failure to use WIC checks. By contrast, for respondents with eight or more barriers, the categorical variable *site of service* was the next best predictor of check usage. Among 572 respondents with eight or more barriers *and* who received services at one of 23 sites (Group A), 44 percent failed to pick-up or cash WIC checks. By contrast, among the 872 respondents who experienced eight or more barriers *and* who received services at one of 26 sites (Group B), 65 percent failed to use their WIC checks. No other variable notably improved the prediction of failure to pick-up or cash WIC checks for Group B sites.

For respondents from Group A sites, the variable *difficulty replacing lost or damaged checks* improved prediction of failure to use WIC checks. There were very few participants who had difficulty replacing lost/damaged checks to affect the overall rate of failure to use WIC checks.

As reported, Figure 4 identified *total number of barriers* and *site of service* as variables that best predicted check usage. The variable *total number of barriers* aggregates the individual barriers into a single variable, while *site of service* aggregates respondents according to the site at which they were interviewed. Therefore, a second classification tree analysis was conducted where the latter variables were excluded in order to directly identify participant-perceived barriers that best predicted check usage.

Figure 5 presents the second tree analysis and shows that approximately 40 percent of all reported failures to use WIC checks were a consequence of *difficulty re-scheduling* and *difficulty re-certifying because of having to bring their infant/child* (a requirement of WIC). To be specific, among those who never had *difficulties re-scheduling*, 42 percent reported failure to use WIC checks in contrast to 65 percent (309) who reported Rarely, Sometimes or Frequently having *difficulties rescheduling an appointment*. Among those who never had *difficulties re-scheduling appointments* but who Rarely, Sometimes or Frequently had *difficulties bringing their infant/child to re-certify*, 58 percent (267) reported not picking up or cashing WIC checks.

**Additional analysis.** To gain a better understanding of the role of the *total number of barriers* as the overall best predictor of check usage, several analyses were conducted. First, using logistic regression, we examined the association between the continuous variable *total number of barriers* and check usage (Figure 6). Results showed an almost linear relationship between *total number of barriers* experienced and check usage behavior. Within the range of 1 to 20 barriers, each additional reported barrier corresponded to an estimated increase of approximately two-percentage points in the proportion of respondents who reported failure to pick-up or cash WIC checks. (Too few respondents reported more than 20 barriers to establish a reliable relationship beyond this point.)

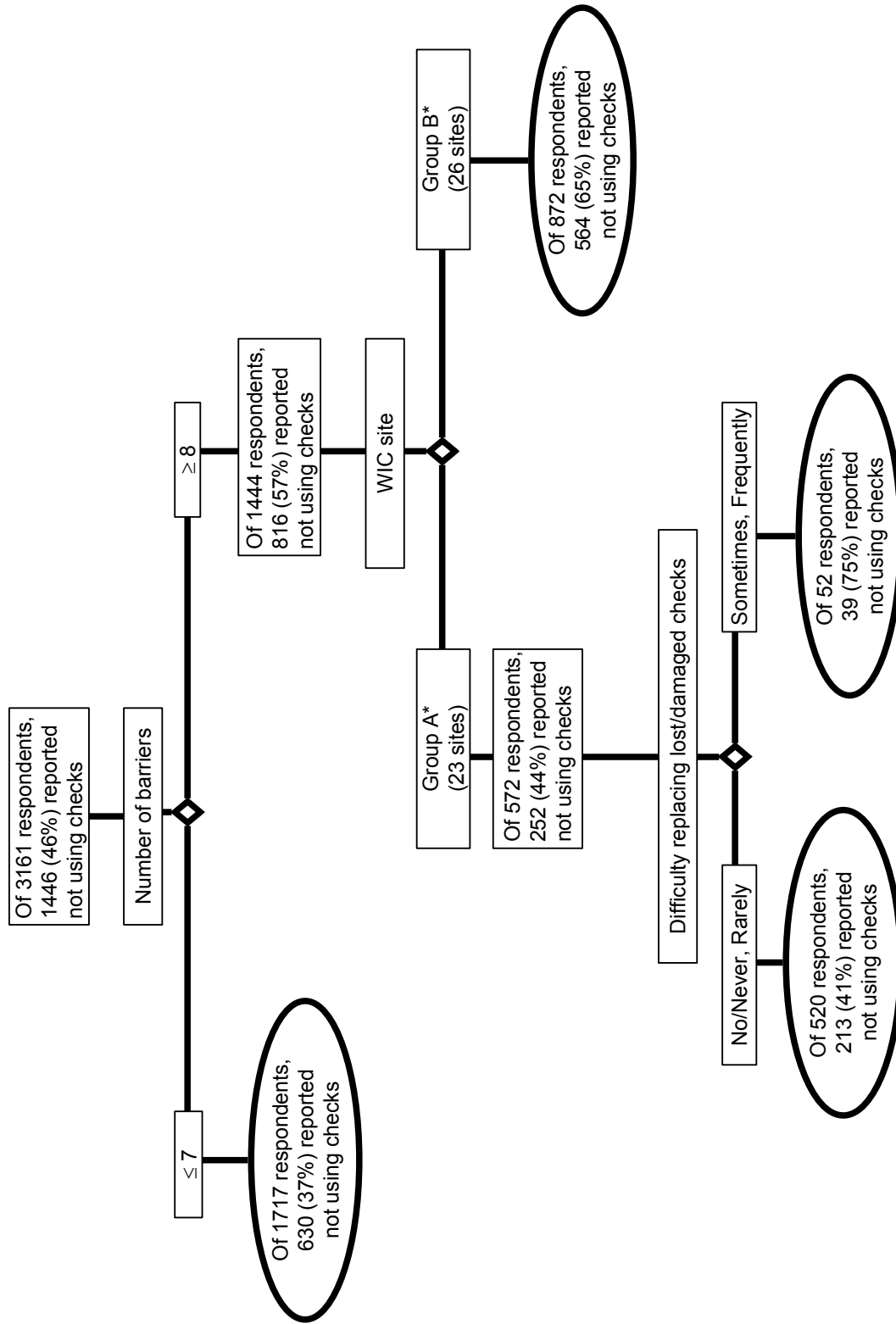
Check usage patterns were next analyzed one barrier at a time. Figure 7 identifies barriers with the greatest *number* of respondents who failed to use WIC checks. The three barriers associated with the greatest *number* of respondents who failed to use WIC checks all involved waiting time. Among 2,165 respondents who reported *waiting more than ½ hour to re-certify*, 1,035 (50 percent) failed to cash all their WIC checks. Among 1,625 respondents who reported *waiting more than ½ hour to pick up checks*, 803 (49 percent) failed to use all their WIC checks. Among 1,515 respondents who reported *waiting too long*, 764 (50 percent) failed to cash all their checks. Waiting was cited as a barrier more frequently than all other reported barriers and waiting was associated with the greatest *number* of respondents who failed to use WIC checks.

Figure 8 illustrates the average number of barriers by waiting time by check usage patterns. Regardless of whether or not respondents reported picking-up or cashing checks, *waiting more than half an hour to pick up checks* was associated with an increased number of reported barriers, an increase of about three barriers. There was a general tendency for respondents who failed to use WIC checks to report more barriers than those who did use all their WIC checks.

**TABLE 10. VARIABLES INCLUDED IN THE CLASSIFICATION TREE ANALYSIS (n=71)**

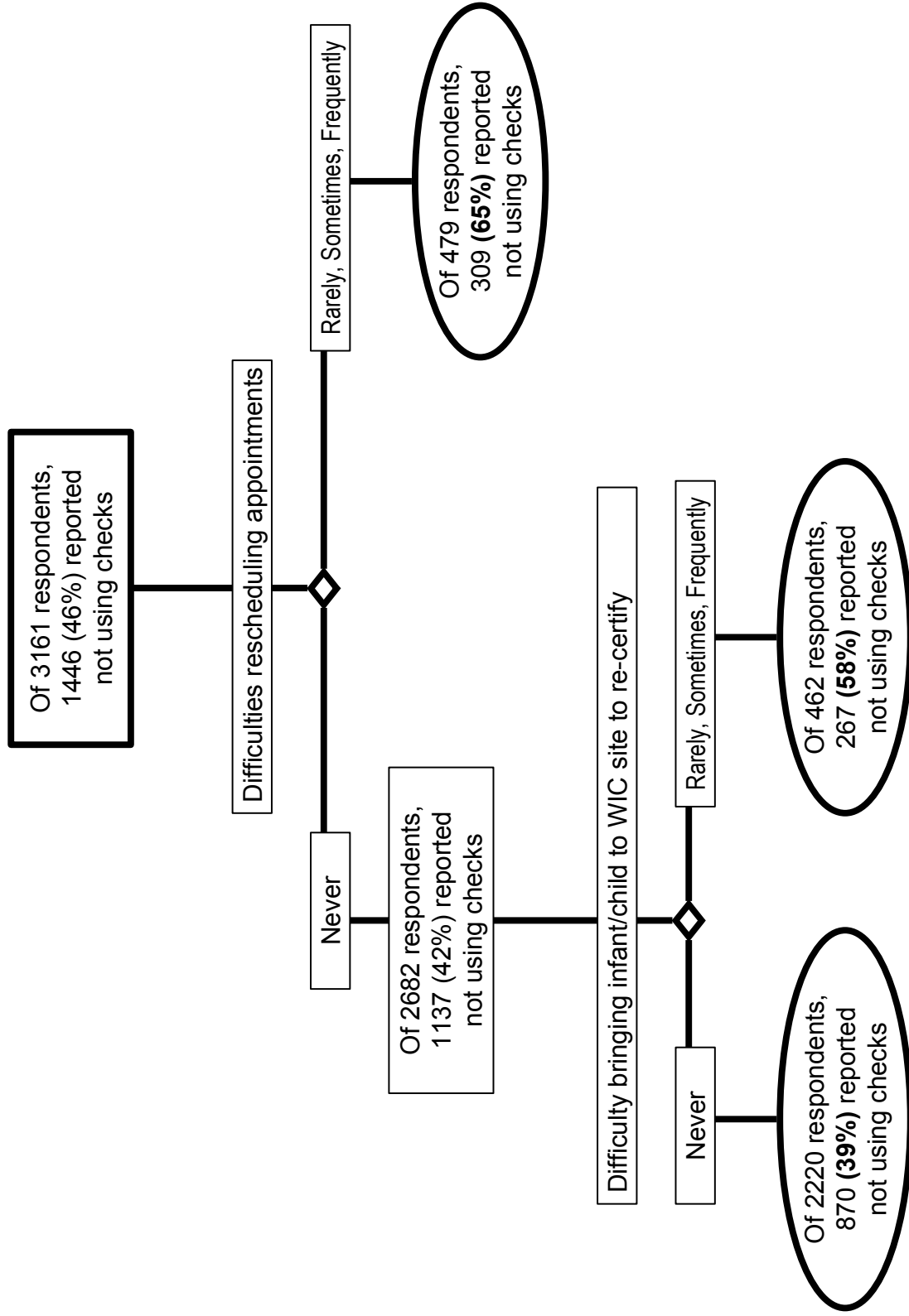
|  |   |
|--|---|
| <b>Access</b>                              | <b>Food procurement-vendor issues</b>       |
| Parking                                    | Stores having different WIC policies        |
| Transportation                             | Negative treatment by store staff           |
| Safety in the neighborhood of the WIC site | WIC food not in stock (availability)        |
| <b>Local agency facility</b>               | Difficulty finding WIC foods (availability) |
| Lacking activities for the children        | Not getting all WIC foods (availability)    |
| Waiting room overcrowded and noisy         | <b>Food variety</b>                         |
| Waiting room unsanitary or not clean       | Variety of cereals                          |
| <b>Local agency staff</b>                  | Variety of juice                            |
| Not being customer friendly                | Variety of cheese                           |
| Treating you negatively                    | Foods inconsistent with cultural diet       |
| Giving conflicting information             | <b>Food quantity</b>                        |
| Not listening to you                       | Too little formula                          |
| Not speaking your language                 | Too little juice                            |
| Insensitive to your culture                | Too little cheese                           |
| <b>Scheduling/time issues</b>              | Too little milk                             |
| Waiting too long                           | Too little cereal                           |
| Wait more than 1 hour to re-certify        | Too little eggs                             |
| Wait more than 1 hour to pick-up checks    | Too little peanut butter                    |
| Wait more than ½ hr to pick-up / recertify | Too little dry beans                        |
| Inconvenient days/hours                    | <b>Socio-demographic, economic, other</b>   |
| Difficulties getting off work              | Marital status                              |
| Rescheduling appointment                   | Education                                   |
| Not given specific appointment time        | Employment status                           |
| Family need separate appointments          | Race/ethnicity of parent/caretaker          |
|  | Age of parent/caretaker                     |
| <b>Operations, rules, regulations</b>      | Level of poverty                            |
| Rules too rigid                            | Food insecurity                             |
| Rules unclear                              | Age of child                                |
| Getting food package changed               | Number of food programs                     |
| Replacing lost/damaged checks              | WIC family composition                      |
| <b>Recertification</b>                     | Fast food consumption                       |
| Must bring infant/child                    | <b>Organization variables</b>               |
| Too much paperwork                         | Agency                                      |
| Infant/child need blood work               | Site of WIC services                        |
| Proxy not allowed to re-certify            | Size of site                                |
| <b>Nutrition education</b>                 | Site automated                              |
| Repetitive                                 | Type of site (permanent/temporary)          |
| Boring                                     | <b>Total</b>                                |
| Too long                                   | Total number of barriers                    |
| Not very useful                            | Total number of categories of barriers      |
| <b>Food procurement-package size</b>       | <b>Outcome variable</b>                     |
| Not getting right cereal box size          | Failure to pick-up or cash WIC checks       |
| Matching check amount to food container    |   |
| Not getting right milk size                |   |

Figure 4. Classification tree for predicting reported failure to use checks

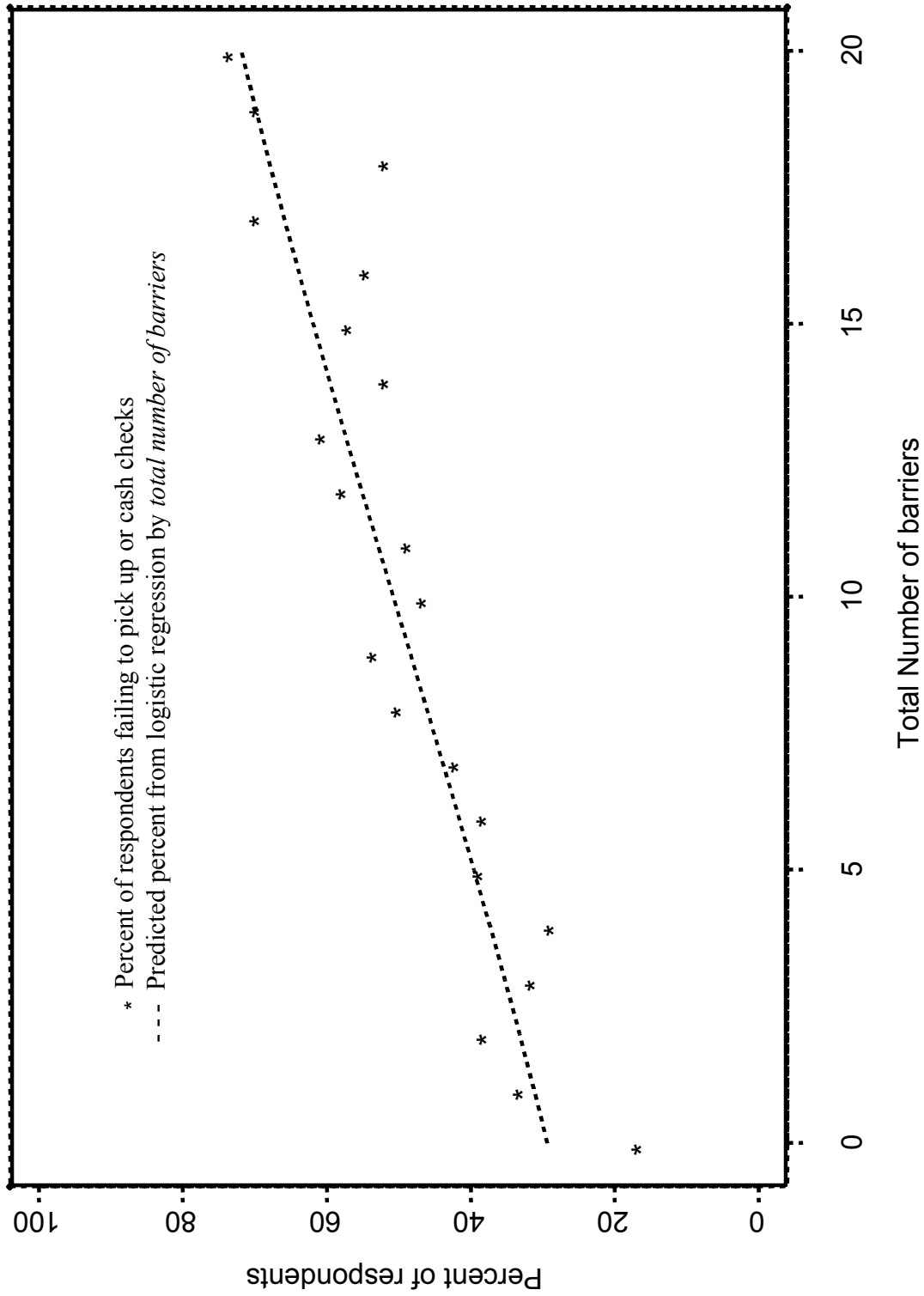


\* 2 WIC sites had no respondents with more than 7 barriers.

**Figure 5. Classification tree for predicting reported failure to use checks (excludes total number of barriers, agency, and site)**

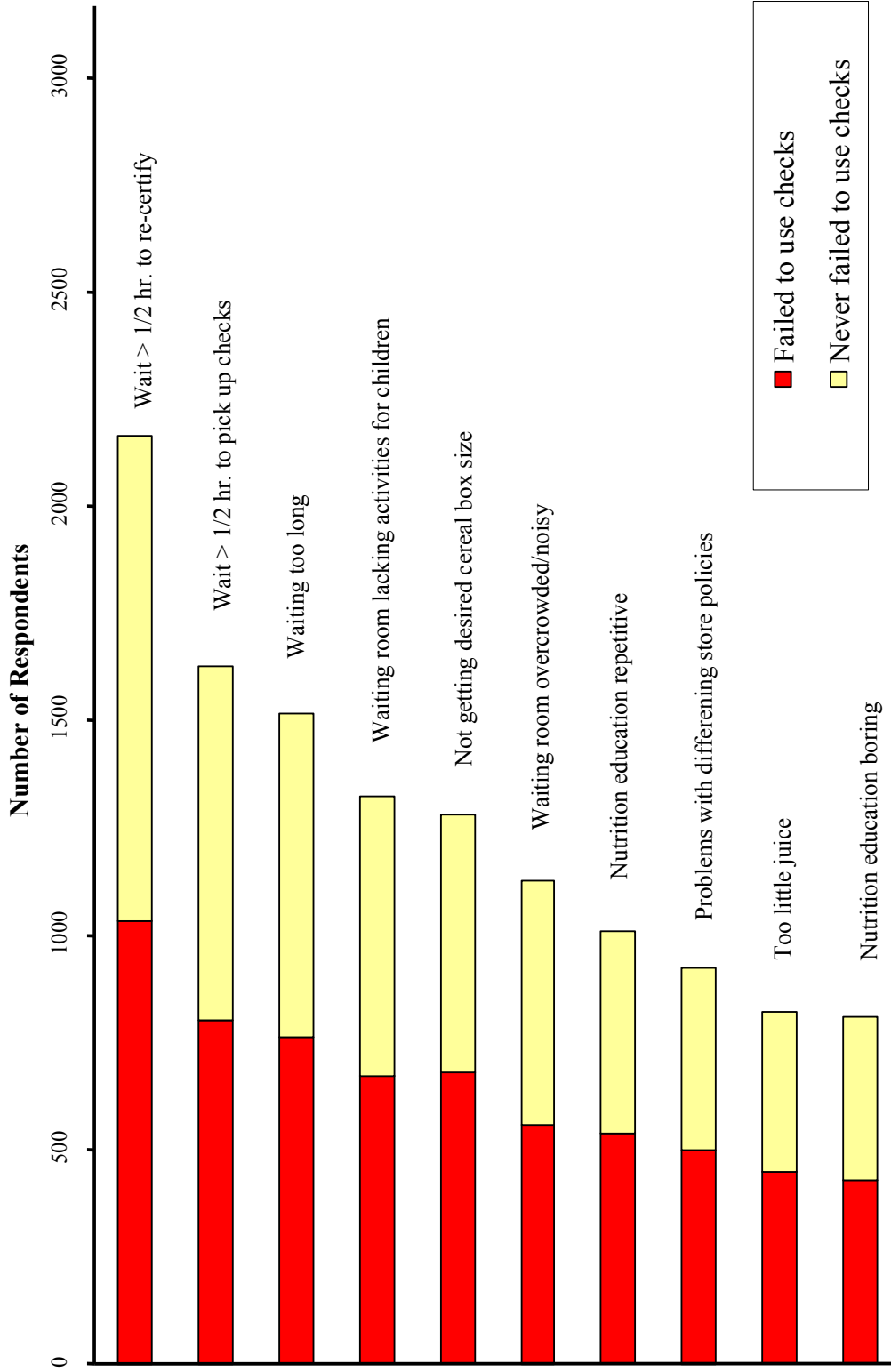


**Figure 6. Percent of respondents reporting failure to use checks  
by total number of barriers (N=3066)**

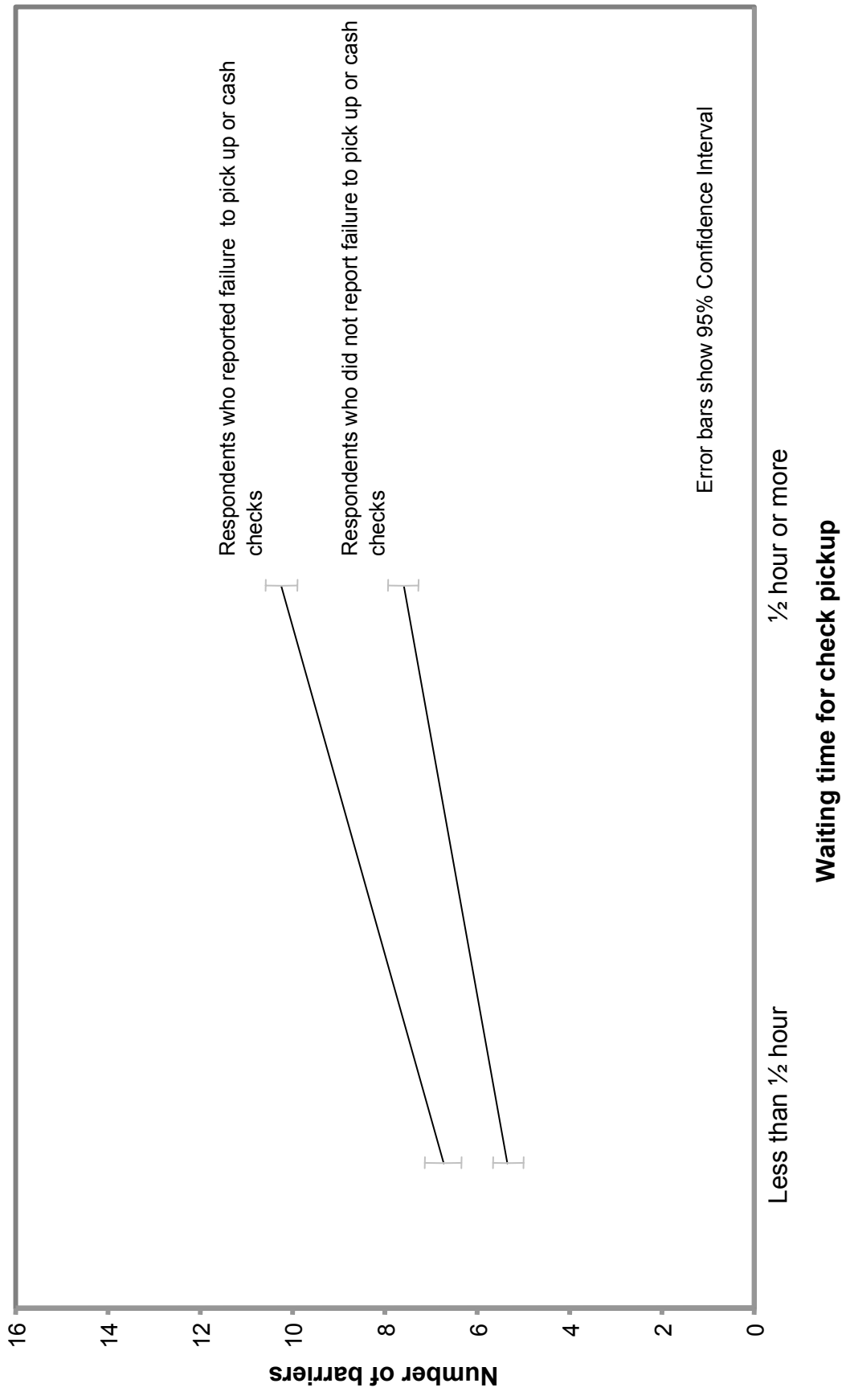




**Figure 7. Ten most frequently cited barriers, showing number of respondents by check usage**



**Figure 8. Average number of barriers by waiting time**



## Summary of results

Results indicated that local WIC agency staff were almost universally perceived by survey respondents as customer friendly, speaking their language, culturally sensitive, attentive to their concerns, giving neither conflicting information or negative treatment. It appears that local WIC agency staff interface especially well with WIC participants. Prior to this study, the NYS WIC Program staff provided formal training at the WIC Training Center to local WIC agency staff on customer service. General WIC operations were rarely identified as barriers. Few respondents reported problems with WIC rules and regulations, the certification process, scheduling an appointment or getting to a WIC site. Few respondents reported personal or social factors affecting program retention.

A comparatively small set of barriers to retention was most common. Of 68 potential WIC process barriers, only 11 were reported to be as Sometimes or Frequently a barrier by more than 20 percent of respondents. These barriers clustered in five client process categories: waiting time, facility, nutrition education, food procurement and food package.

Waiting too long, the most frequently cited barrier, was reported by 48 percent of respondents. Twenty-seven percent said they waited more than an hour to re-certify. Other frequently cited barriers included overcrowded, noisy sites (36 percent), nothing for children to do while waiting (42 percent), boring nutrition education (27 percent) and repetitive nutrition education (33 percent). Many respondents reported difficulty matching food container sizes in stores to the designated size on the WIC food voucher (23 percent) and not getting the right cereal box size (41 percent). Many respondents reported that the WIC benefit provides too little formula (38 percent) or too little juice (27 percent). The most frequently cited barriers were the same for all race/ethnic groups and for upstate NY and NYC respondents, although the rank order differed. However, there were some statistically significant differences across race/ethnic groups; mostly among barriers cited less frequently. A higher percentage of Black respondents than White and Hispanic respondents had difficulty getting off work when scheduling appointments (19, 12, 14 percent, respectively). A higher percentage of Hispanic respondents than Black or White respondents reported a language barrier (7, 0, 1 percent, respectively), the WIC diet as inconsistent with their cultural diet (9, 3, 6 percent, respectively), problems with neighborhood safety (8, 3, 5 percent respectively) and too little milk (19, 10, 13 percent, respectively). Hispanic and Black respondents, more than White respondents reported overcrowded sites (41, 40, 32 percent, respectively) and too little dry beans (9, 9, 4 percent, respectively). For NYC respondents, four additional barriers were reported as problematic by more than 20 percent of respondents: nutrition education was too long, not very useful, too little food and lack of cereal variety.

Variables predictive of failure to use WIC checks included *total number of barriers*, *site of WIC services*, *difficulty re-scheduling appointments* and *difficulty re-certifying because they had to bring their infant/child to the WIC site*. The latter two barriers were cited by 40 percent of respondents who reported failure to use WIC checks. Further analyses indicated that (1) for each additional reported barrier, there was a two-percentage increase in failure to cash checks; (2) waiting for services was related to an increase in the number of people who failed to use checks; and (3) the longer the reported wait, the greater the number of reported barriers.

## Conclusion

While some of these barriers to retention may be addressed directly by local WIC agencies, other barriers are under the purview of state and federal policy makers. In the NYS WIC Program, strong and concerted efforts are underway to address barriers to retention identified by the research. These efforts as well as future action and research needs are discussed within the context of the most frequently cited barriers and barriers predictive of WIC check usage.

### Action steps, future action or research needs

#### Waiting barriers and facility barriers:

##### Waiting too long, overcrowded, noisy sites, nothing for kids to do

Long waiting times, the most frequently cited barrier, may contribute to creating facility environments that are crowded and noisy and lead to complaints that there is nothing for children to do. A decrease in waiting times should generally reduce exposure to noisy, crowded facilities and lead to fewer reports of nothing for kids to do.

**WIC Automation.** Improvements to program operations began with the recently completed automation of the WIC Program. One goal of WIC automation was to reduce overall waiting times. In local WIC agencies that are automated, participants do not have to return to pick up checks because they receive checks at the time of their certification. Plans are also underway to link directly to the NYS Medicaid database, which should further reduce waiting times.

**12-month enrollment period.** The NYS Division of Nutrition is working with the National Association of WIC Directors Evaluation Team to examine virtues and limitations of extending the certification period for children on WIC from six to 12 months. This change would reduce waiting times.

**Improved clinic operations.** The WIC Outreach and Retention Committee training plans will include working with local WIC agencies to focus specifically on participant flow practices to determine if waiting times can be reduced through efficiencies in clinic operations.

**Future action or research needs.** It may be useful to conduct research to determine if reported barriers, such as waiting too long for services and overcrowded, noisy sites, are related to the allocation of resources from federal to states or from states to their local WIC agencies. The manner in which resources are allocated may differentially affect the ability of local WIC agency to adequately retain participants. It may be useful to assess differences among agencies with high rates of check usage to those with low rates of check usage and those agencies with long waiting times vs. shorter waiting times to identify best practices for efficient and effective delivery of services.

## **Nutrition education barriers: Boring and repetitive**

Nutrition education, one of the most important components of the WIC Program, is viewed by many respondents as boring and repetitive. The WIC Program is required to offer at least two nutrition education sessions to a participant per certification period or quarterly when the certification period is one year. The same nutrition education messages may be provided multiple times to the same person. A prenatal WIC participant may be provided nutrition education during pregnancy and again when certifying her infant. If the infant is enrolled as a child, the same nutrition messages are again offered. While repetition aids learning, at some point messages may become boring and no longer conducive to learning. Interestingly, an overwhelming number (86%) reported nutrition education very useful.

**Eat Well Plan Hard Nutrition Intervention.** Consistent with results of this study, the WIC Nutrition Services Unit redesigned their nutrition education curriculum in order to revitalize nutrition education by making it more relevant to today's nutrition concerns. The new curriculum includes up-to-date practices, lesson plans and training aides; it aligns nutrition education with Eat Well Play Hard (EWPH), a NYS nutrition and physical activity intervention designed to prevent childhood overweight and reduce long-term risks for chronic disease. Its promise lies in the design of consistent age-specific and age-appropriate physical activity message strategies aimed at reducing childhood overweight, directed at specific audiences and delivered through multiple channels. The EWPH intervention will be interwoven with WIC's current nutrition education. Age-specific messages and guidelines are combined to promote physical activity, low-fat dairy products, fruit and vegetable consumption with an intended outcome of normal weight. In addition, an annual NYS WIC participant survey was already in place, which will be used to monitor WIC participants' feedback on nutrition education.

**Future action or research needs.** Revitalization of nutrition education is one of the NYS WIC Program's primary goals. Nutrition education has traditionally depended on written education and information material. Even if this material is written appropriately for the lower literacy portion of the WIC population, it may not be the most effective way to engage WIC participants and bring about the desired nutrition behavior. Social modeling via video tape or peer group and/or hands on instruction for recommended nutrition behaviors may increase a WIC participant's confidence in their ability to perform the behavior.<sup>43</sup> Desired behavior change would include, for example, increased fruit and vegetable and low fat dairy consumption as advocated by the EWPH nutrition intervention. It is considered imperative that alternative teaching methods be culturally appropriate.

The importance of the local WIC nutrition educator to the success of WIC is not always recognized. The NYS WIC Program therefore is attempting to determine the best approach to elevate and recognize the important role of WIC nutrition educators in improving the health status of WIC participants. This will involve identifying successful theories and nutrition education practices related to healthy outcomes or healthy behaviors. Facilitated group discussions have been shown effective in engaging WIC staff and WIC participants in

stimulating conversation about nutrition. This may be another option to revitalize nutrition education.

**Food procurement and food package barriers:  
Difficulty matching WIC vouchers to store food package; lack of cereal variety, cereal box size, too little formula, and too little juice.**

Many WIC respondents reported having difficulty matching vouchers to the corresponding size of the food package. Focus group participants reported that they were not receiving all foods to which the program said they were entitled. For example, food vouchers permit the purchase of up to 36 ounces of cereal but participants are not permitted to purchase packages below 13 ounces. Cereal manufacturers package some cereals in 13-ounce sizes. Participants who choose those cereals receive 26 ounces not 36 ounces. The limit on box size was a cost containment effort instituted by NYS to lower the state's average food package cost so that a maximum number of WIC eligible participants could be served. Reports of too little formula and too little juice have implications for policy and education.

**The WIC Food Card 2001 Work Group** was created to review cereal and juices. Efforts were aimed at making the food package more attractive and culturally relevant to participants, keeping within nutritional standards and cost. The Food Card Work Group is part of the WIC Program Vendor Unit and includes representatives from WIC Nutrition Services, WIC Resource Allocation, Division policy and barriers grant staff. The current WIC Acceptable Foods Card was issued in 1997. In January 2001, a Request for Information was distributed to about 90 food companies and vendors requesting applications for cereals and juices for consideration in the NYS WIC Program. There were several goals for the revised food card, that address barriers to program retention. Plans are to include a greater variety of cereals and juices (national and store brands) on the new food card. Increasing the variety of cereals will result in an increased variety of cereal package sizes. Whenever possible, additional cereal and juice selections will be based on participant preferences identified through local agency survey data and other consumer research information. The food card will be redesigned to make it easier to read and use. It is scheduled for release to vendors and local agencies in the fall of 2001. Thus, the new food card should address several reported barriers – cereal variety, cereal box size and matching of vouchers to cereal box size.

**Future action or research needs.** With respect to reports of too little formula and too little juice, some participants may be unaware that WIC is a supplemental foods program. NYS WIC policy makers are concerned also that WIC children are consuming too much juice at the expense of milk, adversely affecting intake of calcium and vitamin D. These concerns may be addressed during nutrition education process. Also helpful may be research that assesses the relationship between the food package, food insecurity and poverty level. It may be that WIC benefits are sufficient for the majority of WIC participants but for a smaller proportion of those who are food insecure, WIC as a supplemental foods program may not be sufficient to ensure appropriate nutrition during periods of critical growth. It may be too that the referral network for those reporting food insecurity needs to be improved.

## **Barriers to check usage:**

### **Total number of barriers, site of service, rescheduling appointments and bringing the infant/child to re-certify.**

Forty-six percent of respondents reported failure to pick-up or cash their WIC checks during the prior few months period. A large percentage of those who failed to use WIC checks (40%) reported that they had difficulty rescheduling appointments or bringing the infant to re-certify. As noted, waiting too long was associated with an increased number of reported barriers and check usage.

A reduction in waiting times should generally reduce overall reported problems and may enable more efficient rescheduling of appointments. As noted above, the WIC Program is working with the National Organization of WIC Directors Evaluation Team to look at the virtues and limitations of extending children's certification period from six to 12 months. This change should help alleviate difficulties associated with having to bring the infant/child to re-certify and contribute to improvements in rescheduling of appointments. The requirement to bring the child to re-certify appears to inhibit the ability of participants to take full advantage of the WIC Program.



## Dissemination of results

Dissemination of study results supports a shared understanding of barriers to retention and affords opportunities to improve access and retention of WIC infants and children. Results from the study on barriers to retention among WIC infants and children are being widely disseminated throughout the local WIC community, the public health and social science academic community and to decision-makers in local, state and federal government. One major venue for dissemination of results to the NYS local WIC community has been through the WIC Program Outreach and Retention Committee.

A description of how study results have been disseminated follows.

**WIC Outreach and Retention Committee.** Local agency WIC staff has always been aware of the need for community outreach to identify and enroll eligible WIC participants. Local WIC agencies do an outstanding job building community networks and identifying resources to reach persons eligible for WIC. Each year local WIC managers develop and implement an outreach plan with special emphasis on outreach to high-risk populations. Because of these outstanding efforts, we estimate that a high percentage of eligible women and infants are enrolled in the program. However, it is recognized that there are many eligible children not enrolled in WIC. In addition, the emphasis at the local agency level had been on outreach with little attention to retention.

It is now understood that the number of participants enrolled at any given time is a function of new enrollments and retention of enrolled eligible participants. In 1999, NYS began focusing on retention rates at the local agencies. However, without reliable data it was difficult to identify specific barriers or underlying reasons from which to develop effective solutions.

**Retention Summit Meetings.** Once data from the barriers to retention study were available, a series of regional retention meetings occurred to disseminate results and focus local agencies' attention on retaining current participants. While some barriers such as increasing cereal variety cannot be addressed at the local level, other barriers, such as waiting time, noisy waiting rooms, boring and repetitive nutrition education, can be addressed by actions at the local agency level.

Bringing staff together in the context of specific findings on barriers to retention permitted local WIC agency staff to generate creative and innovative solutions for improvements at the local WIC agency. The first regional retention summit meeting was held March 30, 1999 in Syracuse, NY. The action plans developed at this meeting focused on improving customer service and included developing a new participant orientation packet and making the waiting room child friendly. One agency developed an incentive program with a "prize" for women who came in for their appointment that month. This would reduce the need for rescheduling. Another local WIC agency arranged through its volunteer network to paint the participant waiting room with designs appealing to young children.

The second retention summit meeting was held June 26, 2000 for WIC local agencies in the Capital District with a similar format as the Syracuse meeting. Over 60 local agency staff attended. Many action plans concentrated on customer service issues; some plans were similar to those developed at the Syracuse meeting. Several agencies developed plans to recognize participants who returned for their appointments. Staff from another local agency decided to put together a poster session for their waiting room that reminds the participants of the value of their food package. A similar poster is being developed for statewide distribution.

The latest retention meeting was held March 30, 2001 for western region staff. Unfortunately, there was a snowstorm that greatly interfered with the day's work and attendance. More than 80 staff were expected and approximately 60 registered. Due to the snowstorm, many participants had to leave after the data presentation. For those staff who remained there was a lengthy discussion about updating the orientation video as a regional project with contributions from the staff of various local agencies. Plans are underway to re-schedule the session. A series of meetings for the 60 local agencies in the metropolitan region is planned for 2002.

**Other dissemination efforts.** In addition to retention summit meetings, a preliminary report "Barriers to Retention Among Infants and Children in the NYS WIC Program" was distributed to all local agencies in July 2000. Color county maps were made available which illustrated, by zip code, the areas of participation, areas of WIC eligibility and areas of unmet need. Agencies use the maps to consider site location and outreach and retention action plans.

A manuscript will be prepared for publication in a peer reviewed public health, nutrition or social science journal such as the American Journal of Public Health or the Journal of the American Dietetic Association. This should make our results available throughout the public health, academic and WIC communities.

A list of presentations made to disseminate results of the barriers to retention study is contained in Appendix 1. Preliminary findings of the barriers study have also been posted on the USDA FNS "WIC Works" web site.

This report will be made available to other states upon request<sup>j</sup>.

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<sup>j</sup> Reports will be made available upon request to NYS Department of Health Division of Nutrition, Evaluation and Analysis Unit, 150 Broadway, FL6 West, Albany NY 12204 or by e-mail at mlw04@health.state.ny.us

# APPENDIX 1

## **Presentations**

“Focus Group Report on Barriers to Retention among Infants and Children on WIC. Preliminary Analysis”. Presented at the NYS WIC Program Retention Summit in Syracuse, NY. March, 1999. Presenter: Ann Marie Popp

“Barriers to Retention Among Infants and Children in the NYS WIC Program: A Preliminary Report from Focus Groups,” NYS Sociological Association Conference. Rochester, NY. 1999. Presenter: Gene Shackman

“Check Usage Patterns in NY WIC,” School of Public Health. Special Applications in Statistics and Biometry.” June, 1999. Presenter: Eileen Fitzpatrick

“Barriers to Retention among Infants and Children on WIC. Preliminary analysis of survey results.” Presented at the NYS WIC Program Capital District Retention Summit in Albany, NY. June 26, 2000. Presenter: Ann Marie Popp

“Barriers to retention among infants and children on WIC in NYS: Preliminary findings.” 2000 NAWD Conference. WIC Rings in the Millennium, Concurrent session on WIC Special Project Grants, a USDA sponsored session. Philadelphia, Pennsylvania. April 18, 2000. Presenters: Ann Marie Popp and Mary Lou Woelfel

“Barriers to Retention among Infants and Children on WIC.” NYS WIC Association Director’s meeting. Albany, NY. October 24, 2000. Presenter: Mary Lou Woelfel and Mary Cowans

“Barriers to Retention among NYC WIC Infants and Children,” NYS WIC Program Committee on Outreach to Immigrant Communities, NYC. November 8, 2000.

“Barriers to retention in a large nutrition and food assistance program: A NYS WIC Program process evaluation.” Presented at the American Public Health Association Annual meeting, Boston, MA. November, 2000. Presenter: Mary Lou Woelfel

“Barriers Affecting Check Usage in the NYS WIC Program.” Presented at the American Public Health Association Annual meeting. Boston, MA. November, 2000. Presenter: Eileen Fitzpatrick

“Focus on Barriers,” in Outlook 2001: The Changing Face of WIC, A Need for Change, Future Directions. WIC Education Day for WIC providers. Legislative Office Building, Albany, NY. January 29, 2001. Presenter: Mary Lou Woelfel and Mary Cowans

“Barriers Study: Nutrition Education,” Improving Nutrition Services in the New Millenium: What We Say and What We Do. WIC Education Day. Best Western, Albany, NY, January 30, 2001. Presenter: Eileen Fitzpatrick

“Barriers to Retention among infants and children in NYS WIC Program,” a poster presentation at the New York State Public Health Association Annual Meetings, Albany, NY. March 12, 2001. Presenter: Gene Shackman

“WIC Retention Study Results,” NYS Department of Health Family Health Team Meeting, Troy, NY. May 7, 2001. Presenter: Mary Lou Woelfel

“Upstate NY and NYC comparisons in Retention patterns among infants and children on WIC.” WIC Rochester Retention Summit. Rochester/Henrietta Town Hall. March 30, 2001. Presenter: Mary Lou Woelfel

“Barriers to Retention among NYS WIC Infants and Children.” Region II Maternal and Child Health Coordination Meetings, Requested by USDA Regional Office. New York City, May 15, 2001. Presenters: Mary Lou Woelfel and Barbara Krueger

“Barriers to Retention among NYS WIC Infants and Children.” Speed Rounds. NYS Department of Health. September, 2001. Presenter: Mary Lou Woelfel

“Comparison of focus group and survey results: NYS WIC Retention Study.” Presented at the Society of Applied Sociology Meetings, Kansas City, NY. October 2001. Presenter: Gene Shackman

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<sup>2</sup> NYS DOH Division of Nutrition Evaluation and Analysis Unit.

<sup>3</sup> U.S. Department of Agriculture, Food and Nutrition Service, Office of Analysis, Nutrition and Evaluation, *WIC Participant and Program Characteristics, 1998*, WIC-00-PC, by Susan Bartlett, Melanie Brown-Lyons, Douglas Moore, and Angela Estacion. Project Officer, Julie Kresgie. Alexandria, VA:2000. Exhibit 2.1, Distribution of WIC Participants by Participant Category, 1992, 1994, 1996, 1998.

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<sup>7</sup> NYS DOH Division of Nutrition Evaluation and Analysis data.

<sup>8</sup> NYS Department of Health; “Table 5: Live Birth Summary Information by Mother’s Age: New York State 1997”; Accessed 4 December, 2000; <<http://www.health.state.ny.us/nysdoh/vs97/tab05.htm>>. “Table 5: Live Birth Summary Information by Mothers Age: York State 1996”; Accessed 4 December, 2000; <<http://www.health.state.ny.us/nysdoh/vs96/table5.htm>>. “Table 5: Live Birth Summary Information by Mother’s Age: New York State 1998”; Accessed 10 September, 2001; <<http://www.health.state.ny.us/nysdoh/vs98/table05.htm>>. Vital Statistics of New York State, various years.

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