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Organizer: Kathleen S. Short, U.S. Census Bureau
Chair: Christopher Wimer, Stanford University
Discussants: Christopher Wimer, Stanford University
David S. Johnson, U.S. Census Bureau

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Supplemental Poverty Measure Thresholds: Imputing Noncash Benefits to the Consumer Expenditure Survey Using Current Population Survey-Part I

Thesia I. Garner
Bureau of Labor Statistics
Division of Price and Index Number Research
U.S. Department of Labor
2 Mass. Ave., NE, Suite 3105
Washington, DC 20212
U.S.A.
Email: garner.thesia@bls.gov

Charles Hokayem
U.S. Census Bureau
Housing and Household Economic Statistics Division,
HQ-7H176
4600 Silver Hill Road
Washington, DC 20233-8500
U.S.A.
Email: charles.hokayem@census.gov

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Abstract

In March 2010 an Interagency Technical Working Group (ITWG) released guidelines on thresholds and resources for a Supplemental Poverty Measure (SPM). The ITWG recommended that thresholds include in-kind benefits that are accounted for in calculating resources; however, the Consumer Expenditure Survey (CE), upon which the thresholds are based, contains limited information on in-kind benefits. In earlier work, Garner (2010) imputed participation rates and benefits for the National School Lunch Program (NSLP) and the Women, Infants, and Children Program (WIC) by applying program eligibility guidelines to the CE sample (CE Eligibility Method). However, program eligibility rates do not equal participation rates since not all eligible households/individuals take up these programs. This paper presents an alternative method to imputing benefits, the CPS Participation Method. This method begins with a model of NSLP and WIC participation based on program participation rates reported in the Current Population Survey Annual Social and Economic Supplement (CPS ASEC) for 2006-2010. In the future, the estimates from the model will be used to impute program participation and assign in-kind benefits to the CE.

I. Introduction

In March 2010 an Interagency Technical Working Group (ITWG) published guidelines for the development and production of thresholds and resources for a Supplemental Poverty Measure (SPM). Consistent with the findings of the National Academy of Sciences (NAS) panel (Citro and Michael 1995), these guidelines recommended that thresholds be based on U.S. Consumer Expenditure Survey (CE) data and resource calculations be based on data from the Current Population Survey Annual Social and Economic Supplement (CPS ASEC). Although the thresholds are based on a set of commodities that families are assumed to purchase: food, clothing, shelter, and utilities (FCSU), the ITWG further recommended that efforts should be made to also include the value of in-kind benefits in the thresholds in order to ensure the consistency of the threshold and resource definitions. Specifically, the ITWG stated "so far as possible with available data, the calculation of FCSU should include any in-kind benefits that are counted on the resource side for food, shelter, clothing and utilities. This is necessary for consistency of the threshold and resource definitions." However, another reason to include the value of these benefits is that resulting thresholds will be more reflective of consumption needs as opposed to only spending needs.[1]

Several recent studies add the value of in-kind benefits from federal government programs. In the past, benefits from the Supplemental Nutrition and Assistance Program (SNAP), National School Lunch Program (NSLP), Women, Infants, and Children (WIC), rent subsidies, and energy assistance have been added to the calculation of resources for the Supplemental Poverty Measure (SPM) (see Short 2011, Short and Renwick2010). Garner (2010a, b, c) imputed in-kind benefits for rent subsidies using data from the CE and from the U.S. Department of Housing and Urban Development. In addition, she imputed benefits for NSLP and WIC to the CE using program eligibility guidelines published by the U. S. Department of Agriculture (USDA) and consumer unit characteristics. For these last two imputations, she assumed that all CE consumer units eligible for NSLP and WIC participated in these programs (CE Eligibility Method). However, eligibility rates do not equal participation rates, since not all eligible individuals or households take up these programs. For example, Jacknowitz and Tiehen (2010) report 79.1 percent of eligible households participated in WIC during the postnatal period.

[1] For the thresholds to be more fully representative of consumption needs, the value of the flow of services from shelter would replace what is spent on shelter. For a discussion of this, see Garner (2005)

This paper is the beginning of a different method for imputing the value of NSLP and WIC program benefits (CPS Participation Method). Data from the CPS ASEC for 2006-2010 are used to estimate probit regression models predicting program participation. This paper focuses on the development of the model. In the future, the model coefficients will be applied to a similar CE sample to impute participation rates and to assign in-kind benefits. Participation rates and in-kind benefit levels will be imputed for each year of data that underlie the SPM thresholds. Predicted participation rates and benefits from the CPS Participation Method will be compared to Garner (2010)'s CE Eligibility Method along with the effects of these methods in the SPM thresholds.[2]

Section II reviews the literature on NSLP and WIC participation to identify factors associated with program participation and help in identifying explanatory variables that are used in the imputation models. Section III describes two methods used to estimate the value of in-kind benefits based on (1) program eligibility using CE data; and (2) program participation rates imputed from the CPS. Section IV presents the CPS ASEC estimation sample and model estimation results. Section V describes how the model will be applied to the CE sample to impute program participation and assign program benefits.

II. Literature Review

a. Factors Associated with National Lunch Program (NSLP) Participation

Prior research identifies several factors associated with participation in the NSLP, including socioeconomic characteristics, participation in other food assistance programs, program features, alternative food choices, region and degree of urbanization. Most studies rely on either student or parent reports of participation or on administrative data. The definition of participation also varies. Some studies define participation by eating a lunch at school while other studies define participation by whether a child qualifies for a free or reduced price. Dunifon and Kowaleski-Jones (2003) define participation by whether a child receives a free or reduced price meal. Using data from the 1997 Panel Study of Income Dynamics, Dunifon and Kowaleski-Jones (2003) find that black children or those having more siblings in the household were more likely to participate in the NSLP than white children or those with fewer siblings, respectively. In contrast, family income and paternal education were negatively associated with participation. Dunifon and Kowaleski-Jones also found a positive association between the percentage of time the child received food stamps and NSLP participation. Using data from the 2010 Survey of income and Program Participation (SIPP) and the 1999-2002 National Health and Nutrition Examination Survey (NHANES), Newman and Ralston (2006) report NSLP participation is highest for children ages 8 to 13 for free, reduced price, and paid meals. Nearly two-thirds of participants for free meals come live in female-headed households. Similarly, Gordon et al (2007), who examine eating lunch at school as well as receiving a free or

[2] This part of the study was presented at the Joint Statistical Meetings in Miami, Florida, August 2, 2011. See Garner and Hokayem 2011b

reduced price, also find differential effects by race, income, and the age composition of the children in the family, as well as by gender. Specifically, Hispanic and black children participate in the NSLP at higher rates than non-Hispanic white children and children of other races. As expected, based on program guidelines, low income children are more likely to participate in the program than their more affluent counterparts. NSLP participation is also higher among boys than girls.

A few studies address the effects of maternal labor supply on NSLP participation, defined as eating a school lunch, with mixed results. Akin et al (1983) find mother's work hours increase NSLP participation, but only for older children ages 12-18. Although Gleason (1995) suggested that children of mothers who work are less likely to participate in the NSLP, this effect is not statistically significant. Using data from the Early Childhood Longitudinal Study – Kindergarten Class (ECLS-K) and employing an instrumental variable approach to address the endogeneity of the maternal labor supply decision, Datar and Nicosia (2009) conclude that maternal employment significantly increased participation with larger effects for mothers working full-time than for those working part-time.

Program features also influence program participation, although the results of these studies are mixed. For example, Akin et al (1983), Maurer (1984), and Gleason (1995) find negative price effects on participation rates while Barnes' (1988) analysis of all meal price types finds students are fairly nonresponsive to the price of meals.

In their analysis of data from the NSLP Access, Participation, Eligibility and Certification Study, Moore et al (2009) report that school type is the factor most strongly associated with participation among students certified for free and reduced price meals. Moore et al (2009) analyze participation by number of school lunches served and by free or reduced price category.

b. Factors Associated with Women, Infants, and Children (WIC) Participation

Prior research reveals that factors influencing participation in the USDA's Special Supplemental Nutritional Program for Women, Infants and Children (WIC) are similar to those associated with NSLP participation. For example, socioeconomic characteristics, participation in other public assistance programs, and program features are also associated with WIC participation.

Using data from the 1996 SIPP panel and the 1998-2001 Current Population Survey March Supplement (CPS), Bitler, Currie and Scholz (2003) examine the determinants of postnatal WIC participation. Overall, their findings suggest that individual characteristics play a larger role in participation than state-level factors. For example, black and Hispanic mothers are more likely to participate than their non-Hispanic white counterparts; however, Asian

mothers are less likely to participate. Having low-income and being married are positively associated with postnatal WIC participation, whereas having attended college and suburban residence are negatively associated with postnatal WIC participation. Other studies find similar factors are associated with prenatal WIC participation (Tiehen and Jacknowitz 2008; Swann 2007). Again, non-Hispanic black and Hispanic mothers are more likely to access WIC prenatally than their non-Hispanic white counterparts (Swann 2007). Prenatal WIC participation is negatively associated with education attainment and age (Tiehen and Jacknowitz 2008; Swann 2007). Swann (2007) also finds that not having health insurance and being a single mother increases the likelihood of prenatal WIC participation. In addition, state policies also affect prenatal WIC participation. Studies including WIC program characteristics find prenatal participation is lower in states requiring income documentation to establish eligibility and is higher in states that allow TANF receipt or Medicaid eligibility to confer automatic WIC eligibility (Oliveira and Frazao 2009; Swann 2010).

A few studies examine the timing and dynamics of WIC participation. For example, Swann (2007) uses the 1988 National Maternal and Infant Health Survey (NMHS) and finds a strong association between previous WIC participation and prenatal WIC participation. Using data from the Early Childhood Longotudinal Study, Birth Cohort (ECLS-B), Jacknowitz and Tiehen (2009) examine transitions into and out of the WIC program from pregnancy until the child is age 1. They conclude that prenatal WIC coverage is strongly correlated with postnatal receipt of WIC and that economic advantage plays an important role in determining exit from WIC. In a similar study, Jacknowitz and Tiehen (2010) find that mothers with a college degree and employed mothers tend to delay WIC participation. Using data from the 2001 SIPP panel, Castner et al (2009) find that mothers in households participating in other public assistance programs in combination with declining earnings have an increased likelihood of entering WIC. Bitler and Currie (2004) also use SIPP data to demonstrate that state Medicaid policies that influence infant take-up rates had long-term effects on WIC participation.

III. Methods to Impute In-Kind Benefits to CE Data

This section describes the CE Eligibility method, the first method developed to impute the value of NSLP and WIC in-kind benefits in the SPM threshold. It also presents the new method, the CPS Participation Method. The key difference in these methods rests on the assumption of participation rates among eligible households. The first method assumes full take-up of program benefits by all eligible consumer units (CE Eligibility method); in contrast, the second method estimates the probability of program take-up and assigns benefits based on this probability (CPS Participation Method).

The CE Eligibility Method assigns program participation to all eligible consumer units based on program eligibility guidelines and consumer unit characteristics from the Consumer

Expenditure Survey (CE). Further, this method assigns the full value of the program benefit to eligible consumer units. See Garner (2010c) for a description of the CE eligibility method, i.e. how the program eligibility guidelines are applied, how the program benefits are calculated, and how the value of program benefits are included in the threshold.

The CPS Participation Method estimates a model predicting program participation using data from the Current Population Survey Annual Social and Economic Supplement. Results from this model will be used to impute participation rates for consumer units in the CE before assigning program benefits (These results are presented in a later study. See Garner and Hokayem 2011b). The model specifications draw on the findings from the previous literature on NSLP and WIC participation, mainly that program participation is a function of demographic characteristics, socioeconomic characteristics, and participation in other public assistance programs. A multinomial probit model is used to estimate NSLP participation, and a binomial probit model is used to predict WIC participation.

The motivation for a multinomial probit model for the NSLP comes from the method of adding this benefit to the measure of resources. All children who eat a lunch at school participate in the NSLP, and all lunches in the NSLP are subsidized. Children qualifying for a free or reduced price school lunch receive a larger subsidy. An estimated cash value is added to resources for children reported receiving a free or reduced price meal and for children reported receiving a subsidized meal. In the CPS, the reference person identifies the number of children who "usually" ate a hot lunch.[3] In a separate question, the reference person identifies the number of children who received a free or reduced price lunch.[4] The CPS instrument does not distinguish between children receiving a free lunch and children receiving a reduced price lunch. The answers to these questions are used to identify the three mutually exclusive alternatives for the multinomial probit model:

(1) At least one child in the household eats a subsidized school lunch **and** qualifies for a free or reduced price (referred to "Subsidized Lunch With A Free or Reduced Price")

(2) At least one child in the household eats a subsidized school lunch but no children in the household qualify for a free or reduced price (referred to "Subsidized Lunch")

(3) No child in the household eats a subsidized school lunch or qualifies for a free or reduced price (referred to "No Subsidized Lunch")

[3] The CPS question asks "During 20.. how many of the children in this household usually ate a complete hot lunch offered at school?"

[4] The CPS question asks "During 20.. how many of the children in this household received free or reduced price lunches because they qualified for the federal school lunch program?"

The multinomial probit model is specified in the following way:

$$y_{ij} = \boldsymbol{x_i'}\beta + \tau + \alpha_s + \varepsilon_{ij}$$

where y_{ij} represents household *i*'s choice of alternative *j* from the set of three alternatives outlined above. The three random error terms are independently and identically distributed with a joint normal distribution. The model produces coefficient estimates for each alternative and does not depend on the independence of irrelevant alternatives (IIA) assumption (Cameron and Trivedi 2005).

The motivation for a probit model for WIC participation also comes from the method of adding this benefit to the measure of resources. This method simply adds the value of WIC benefits based on program information from the Department of Agriculture. It relies on a CPS question asking about anyone in the household who was on WIC.[5] This question is used to determine the outcome of the probit model.

The probit model is specified in the following way:

$$y_i = \boldsymbol{x_i'}\beta + \tau + \alpha_s + \varepsilon_i$$

where y_i is a dichotomous variable equal to 1 for WIC program participation, zero otherwise. The random error term follows a normal distribution.

In both model specifications $\boldsymbol{x_i'}$ is a vector of demographic characteristics for the head of household, characteristics of the household, public assistance variables, and residence type. τ is a vector of annual dummy variables for 2005-2009,the reference years for the ASEC data, omitting the year 2005. α_s is a vector of state fixed effects, omitting the state of Oklahoma. Both model specifications are estimated via maximum likelihood.

$\boldsymbol{x_i'}$ differs for NSLP and WIC specifications only in the age composition of children variables. Since the WIC program is targeted to infants and young children below the age of 5, the WIC specification only includes a count of the number of children in the household between ages 0 and 5. Similarly, since the NSLP program is targeted to school-age children, the NSLP specification only includes a count of the number of children in the household for the age groups corresponding to elementary school (ages 5-10), middle school (ages 11-13), and high school (ages 14-18). Table 1 describes the remaining explanatory variables used in both specifications.

IV. CPS Estimation Sample and Estimation Results

[5] The CPS question asks "At any time last year, (were you/was anyone in this household) on WIC, the Women, Infants, and Children Nutrition Program?"

The data for the multinomial and binomial probit models come from the Current Population Survey Annual Social and Economic Supplement (CPS ASEC) 2006-2010. The analysis sample draws on a pooled sample of households with annual reference periods for calendar years 2005-2009. By pooling the data for all the years, we are able to estimate the state fixed effects using a larger sample size. To create a consistent sample between the CPS ASEC and the Consumer Expenditure Survey, the sample covers all states excluding Iowa, New Mexico, North Dakota, Vermont, and Wyoming.[6] To be in the CPS NSLP universe a household must have a child between the ages of 5 and 18, inclusive. To be in the CPS WIC universe a household must meet one of two conditions: (1) have at least one female member age 15 or above and a child less than age 6; or (2) have at least one female member between the ages of 15 and 45.[7] Both samples omit any household reporting negative income or income greater than $200,000.[8] Both samples also omit households headed by an individual whose work status is the armed forces.

Tables 2 and 3 present sample summary statistics for the NSLP and WIC estimation samples, respectively. Each table shows weighted summary statistics by year and for pooled years. The change in WIC sample sizes from 2007 to 2008 is due to a change in the way the CPS reports the WIC universe. Beginning with 2008, the CPS ASEC started reporting households not in the WIC universe. Prior to 2008, the CPS ASEC grouped households not in the WIC universe together with households reporting "No." Since the unit of observation differs, the household participation rates in Table 2 and Table 3 are not comparable to individual participation rates published by the USDA.

Tables 4 and 5 present the results of the multinomial and binomial probit estimations, respectively. Column 1 in Table 4 contains estimates for the choice "Subsidized Lunch With A Free or Reduced Price," and column 2 in Table 4 contains the estimates for the "Subsidized Lunch" choice. The choice "No Subsidized Lunch" is the reference outcome. The estimated coefficients do not represent marginal effects. The reference state for both tables is Oklahoma. The reference year in both tables is 2005.

Table 6 gives the average predicted probabilities of school lunch and WIC program participation generated by the models. Specifically, the estimated model coefficients are applied to household characteristics in the CPS ASAEC samples to predict the probabilities. Table 6 reports the average of the predicted probabilities in the sample. Table 7 provides the probability of school lunch and WIC participation based on reported participation in the CPS. Table 7 simply repeats this information from Table 2 and Table 3 for ease of comparison.

[6] The Consumer Expenditure Survey does not sample consumer units in these states, as it is based on population by region, not states.

[7] Defining the universe in this way also includes a pregnant woman eligible for WIC.

[8] Any household reporting zero income is changed to $1 to facilitate taking the natural log for model estimation.

V. Next Steps

This paper develops a model for predicting NSLP and WIC participation using data from the Current Population Survey Annual Social and Economic Supplement (CPS ASEC). This section describes the next steps necessary to apply the model to the Consumer Expenditure Survey (CE) and assign NSLP and WIC benefits. To apply the model a CE sample is drawn to be consistent with the CE NSLP and WIC universes described in the previous section, with a reference period that is approximately the same as that of the CPS sample: 2005-2009. The CE data are collected quarterly, so the CE sample will be pooled, assuming data from each quarter are independent of data from other quarters. The coefficients will be applied to each consumer unit, within the NSLP and WIC identified samples, in each quarter of the data over the data collection time period 2005 quarter 2 through 2010 quarter one. The estimated coefficients from the multinomial and binomial probit models will be applied to the same characteristics in the CE sample to estimate a probability for each outcome: (1) "Subsidized Lunch With A Free or Reduced Price" (2) "Subsidized Lunch" (3) "No Subsidized Lunch" and (4) "WIC." Benefits will be assigned using the CE predicted probabilities. Thresholds will be created described in Garner (2010c) for comparison to thresholds generated by the CE Eligibility Method. In addition, the distribution of program benefits in the CPS and CE should be compared to gauge the quality of this method.

While the CPS Participation Method offers one way to impute in-kind benefits in the CE, additional methods should be explored. An alternative method would employ a statistical matching model. The model developed in this paper can be used as a basis for a predictive mean matching model where CE consumer units are matched to CPS households based on the predicted probability. The matched CPS household would serve as the 'donor' observation for the NSLP or WIC benefit of the CE consumer unit. This method offers the advantage of not designating a probability cutoff for program participation.

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Table 1: Explanatory Variables in Mulitnomial Probit and Probit Models

Variable Name	Description
Head of Household Variables	
Age	Age in years
Race	
White, non-Hispanic	Dummy variable for white, non-Hispanic
Black, non-Hispanic	Dummy variable for black, non-Hispanic
Hispanic	Dummy variable for Hispanic
Other race (excl. category)	Dummy variable for other race
Gender	
Male (excl. category)	Dummy variable for male
Female	Dummy variable for female
Education	
Low education (excl. category)	Dummy variable for low education (less than 12 years)
Medium education	Dummy variable for medium education (between 12 and 14 years, inclusive)
High education	Dummy variable for high education (greater than or equal to 15 years)
Marital Status	
Married (excl. category)	Dummy variable for married
Widowed	Dummy variable for widowed
Past marriage	Dummy variable for past marriage
Never married	Dummy variable for never married
Employment	
Not in labor force (excl. category)	Dummy variable for not in the labor force
Unemployed	Dummy variable for 0 hours worked
Part-time	Dummy variable for hours worked between 0 and 35
Full-time	Dummy variable for greater than or equal to 35 hours worked
Household Variables	
Household income	Household income
Household size	Household size
Age composition of children	
Number of children 0-5	Number of children between ages 0 and 5, inclusive
Number of children 5-10	Number of children between ages 5 and 10, inclusive
Number of children 11-13	Number of children between ages 11 and 13, inclusive
Number of children 14-18	Number of children between ages 14 and 18, inclusive
Public Assistance	
Foodstamp	Dummy variable for anyone in household receiving food stamps
Welfare	Dummy variable for anyone in household receiving welfare
Medicaid	Dummy variable for anyone in household covered by Medicaid
Residence	
Urban	Dummy variable for residing in a metropolitan area
Rural (excl. category)	Dummy variable for residing in a nonmetropolitan area

Table 2: Weighted Sample Summary Statistics for NSLP Model, CPS ASEC 2006-2010

Variable Name	2006 ASEC Mean	2006 ASEC SE	2007 ASEC Mean	2007 ASEC SE	2008 ASEC Mean	2008 ASEC SE	2009 ASEC Mean	2009 ASEC SE	2010 ASEC Mean	2010 ASEC SE	2006-2010 ASEC Mean	2006-2010 ASEC SE
Head of Household Variables												
Age	41.32	0.068	41.57	0.071	41.70	0.077	41.66	0.079	41.85	0.078	41.62	0.038
Race												
White, non-Hispanic	0.61	0.003	0.61	0.003	0.59	0.003	0.59	0.003	0.59	0.003	0.60	0.002
Black, non-Hispanic	0.15	0.002	0.15	0.002	0.15	0.002	0.16	0.002	0.15	0.002	0.15	0.001
Hispanic	0.18	0.002	0.18	0.002	0.19	0.002	0.19	0.002	0.19	0.002	0.19	0.001
Other race (excl. category)	0.06	0.002	0.06	0.001	0.06	0.001	0.06	0.002	0.07	0.002	0.06	0.001
Gender												
Male (excl. category)	0.47	0.004	0.47	0.004	0.46	0.003	0.46	0.004	0.46	0.004	0.46	0.002
Female	0.53	0.004	0.53	0.004	0.54	0.003	0.54	0.004	0.54	0.004	0.54	0.002
Education												
Low education (excl. category)	0.15	0.002	0.15	0.003	0.15	0.003	0.15	0.003	0.15	0.003	0.15	0.002
Medium education	0.77	0.003	0.77	0.003	0.77	0.003	0.77	0.003	0.77	0.003	0.77	0.002
High education	0.08	0.002	0.08	0.002	0.08	0.002	0.08	0.002	0.08	0.002	0.08	0.001
Marital Status												
Married (excl. category)	0.68	0.004	0.67	0.004	0.66	0.003	0.66	0.003	0.65	0.003	0.66	0.002
Widowed	0.03	0.001	0.03	0.001	0.03	0.001	0.03	0.001	0.03	0.001	0.03	0.001
Past married	0.18	0.003	0.18	0.003	0.18	0.002	0.18	0.003	0.18	0.003	0.18	0.001
Never married	0.12	0.003	0.12	0.002	0.13	0.003	0.14	0.003	0.14	0.002	0.13	0.001
Employment												
Not in labor force (excl. category)	0.19	0.003	0.19	0.003	0.19	0.003	0.20	0.003	0.20	0.003	0.19	0.002
Unemployed	0.04	0.001	0.03	0.001	0.04	0.002	0.07	0.002	0.08	0.002	0.05	0.001
Part-time	0.10	0.002	0.11	0.002	0.11	0.002	0.13	0.002	0.13	0.002	0.12	0.001
Full-time	0.67	0.003	0.67	0.004	0.65	0.004	0.61	0.004	0.59	0.004	0.64	0.002
Household Variables												
Household income	63,300	325	65,636	352	66,361	346	66,478	341	65,719	366	65,501	215
Household size	4.04	0.010	4.05	0.009	4.05	0.010	4.06	0.010	4.09	0.012	4.06	0.006
Age composition of children												
Number of children 5-10	0.74	0.005	0.74	0.005	0.73	0.006	0.74	0.006	0.74	0.005	0.74	0.003
Number of children 11-13	0.38	0.004	0.38	0.004	0.37	0.005	0.36	0.004	0.37	0.004	0.37	0.002
Number of children 14-18	0.51	0.005	0.50	0.005	0.50	0.005	0.50	0.005	0.49	0.004	0.50	0.002
Public Assistance												
Foodstamp	0.12	0.003	0.11	0.003	0.11	0.003	0.14	0.003	0.16	0.003	0.13	0.002
Welfare	0.04	0.001	0.03	0.001	0.03	0.001	0.03	0.001	0.04	0.001	0.03	0.001
Medicaid	0.27	0.003	0.28	0.004	0.29	0.004	0.31	0.003	0.34	0.004	0.30	0.002
Residence												
Urban	0.84	0.006	0.84	0.005	0.84	0.006	0.84	0.006	0.84	0.006	0.84	0.005
Rural (excl. category)	0.16	0.006	0.16	0.005	0.16	0.006	0.16	0.006	0.16	0.006	0.16	0.005
School Lunch Participation												
Subsidized Lunch, FR	0.25	0.003	0.25	0.003	0.24	0.004	0.26	0.003	0.28	0.003	0.26	0.002
Subsidized Lunch	0.44	0.004	0.43	0.004	0.43	0.004	0.42	0.004	0.41	0.004	0.43	0.002
No Subsidized Lunch	0.31	0.004	0.32	0.004	0.33	0.004	0.32	0.004	0.31	0.004	0.32	0.002
Number of households in estimation sample	25,000		24,546		24,721		24,533		24,441		123,241	

Source: U.S. Census Bureau, Current Population Survey, 2006-2010 Annual Social and Economic Supplement. For outcomes, "Subsidized, FR" refers to receiving a subsidized lunch with a free or reduced Price, "Subsidized Lunch" refers to receiving a subsidized lunch, and "No Subsidized Lunch" refers to not receiving a subsidized lunch. Standard errors are estimated using replicate weights (Fay's method). For information on sampling and nonsampling error, see <www.census.gov/apsd/techdoc/cps/cpsmar10.pdf>.

Table 3: Weighted Sample Summary Statistics for WIC Model, CPS ASEC 2006-2010

Variable Name	2006 ASEC Mean	2006 ASEC SE	2007 ASEC Mean	2007 ASEC SE	2008 ASEC Mean	2008 ASEC SE	2009 ASEC Mean	2009 ASEC SE	2010 ASEC Mean	2010 ASEC SE	2006-2010 ASEC Mean	2006-2010 ASEC SE
Head of Household Variables												
Age	49.26	0.057	49.38	0.056	37.50	0.104	37.79	0.103	37.87	0.096	46.22	0.042
Race												
White, non-Hispanic	0.71	0.001	0.71	0.001	0.52	0.003	0.52	0.003	0.52	0.003	0.14	0.001
Black, non-Hispanic	0.12	0.001	0.13	0.001	0.19	0.002	0.18	0.003	0.19	0.003	0.14	0.001
Hispanic	0.11	0.001	0.11	0.001	0.22	0.003	0.23	0.002	0.22	0.002	0.06	0.001
Other race (excl. category)	0.05	0.001	0.05	0.001	0.06	0.002	0.07	0.002	0.07	0.002	0.66	0.001
Gender												
Male (excl. category)	0.51	0.003	0.50	0.002	0.38	0.004	0.38	0.004	0.39	0.004	0.47	0.002
Female	0.49	0.003	0.50	0.002	0.62	0.004	0.62	0.004	0.61	0.004	0.53	0.002
Education												
Low education (excl. category)	0.15	0.002	0.14	0.002	0.20	0.003	0.20	0.004	0.19	0.003	0.16	0.001
Med education	0.76	0.002	0.77	0.002	0.76	0.004	0.76	0.004	0.77	0.003	0.76	0.002
High education	0.09	0.001	0.09	0.001	0.04	0.002	0.04	0.002	0.04	0.002	0.08	0.001
Marital Status												
Married (excl. category)	0.52	0.002	0.51	0.002	0.51	0.004	0.52	0.004	0.51	0.004	0.51	0.002
Widowed	0.10	0.001	0.10	0.001	0.03	0.002	0.03	0.001	0.03	0.002	0.09	0.001
Past married	0.18	0.002	0.18	0.002	0.18	0.003	0.17	0.003	0.17	0.003	0.18	0.001
Never married	0.20	0.002	0.20	0.002	0.28	0.004	0.28	0.004	0.28	0.004	0.22	0.002
Employment												
Not in labor force (excl. category)	0.34	0.002	0.33	0.002	0.25	0.004	0.26	0.004	0.26	0.004	0.32	0.001
Unemployed	0.03	0.001	0.03	0.001	0.06	0.002	0.09	0.002	0.11	0.003	0.04	0.001
Part-time	0.09	0.001	0.09	0.001	0.13	0.003	0.15	0.003	0.16	0.003	0.11	0.001
Full-time	0.54	0.002	0.54	0.002	0.57	0.004	0.50	0.004	0.48	0.004	0.53	0.002
Household Variables												
Household income	54,528	201	56,614	213	45,069	294	45,343	325	44,433	325	52,730	165
Household size	2.51	0.006	2.50	0.006	3.54	0.016	3.57	0.014	3.60	0.017	2.79	0.006
Age composition of children												
Number of children 0-5	0.21	0.002	0.21	0.002	0.52	0.007	0.52	0.007	0.52	0.006	0.29	0.002
Public Assistance												
Foodstamp	0.07	0.001	0.06	0.001	0.18	0.004	0.21	0.004	0.25	0.004	0.11	0.001
Welfare	0.02	0.001	0.01	0.001	0.05	0.002	0.05	0.002	0.05	0.002	0.02	0.001
Medicaid	0.16	0.002	0.16	0.002	0.38	0.005	0.40	0.004	0.43	0.005	0.23	0.002
Residence												
Urban	0.83	0.005	0.84	0.005	0.83	0.007	0.83	0.006	0.83	0.007	0.83	0.006
Rural (excl. category)	0.17	0.005	0.16	0.005	0.17	0.007	0.17	0.006	0.17	0.007	0.17	0.006
WIC Participation (%)	0.030	0.001	0.030	0.001	0.119	0.003	0.127	0.003	0.132	0.003	0.056	0.001
Number of households in estimation sample	68,121		67,443		18,045		18,198		18,826		190,633	

Source: U.S. Census Bureau, Current Population Survey, 2006-2010 Annual Social and Economic Supplement. Standard errors are estimated using replicate weights (Fay's method). For information on sampling and nonsampling error, see <www.census.gov/apsd/techdoc/cps/cpsmar10.pdf>.

Table 4: Multinomial Probit Model for NSLP, CPS ASEC 2006-2010

VARIABLES	(1) Subsidized Lunch With A Free or Reduced Price	(2) Subsidized Lunch
Age	-0.00458***	-0.000815
	(0.000944)	(0.000793)
White, non-Hispanic	-0.362***	0.0112
	(0.0383)	(0.0311)
Black, non-Hispanic	0.346***	0.147***
	(0.0465)	(0.0392)
Hispanic	0.608***	0.155***
	(0.0405)	(0.0372)
Female	0.143***	0.000249
	(0.0186)	(0.0165)
Medium education	-0.414***	0.0718***
	(0.0267)	(0.0256)
High education	-1.357***	-0.180***
	(0.0541)	(0.0340)
Widowed	0.479***	0.178***
	(0.0541)	(0.0431)
Past married	0.464***	0.115***
	(0.0254)	(0.0207)
Never married	0.315***	-0.0107
	(0.0298)	(0.0263)
ln(household income)	-0.133***	0.182***
	(0.00914)	(0.0142)
Household size	-0.0905***	-0.0157**
	(0.00978)	(0.00773)
Number of children 5-10	0.467***	0.240***
	(0.0158)	(0.0135)
Number of children 11-13	0.541***	0.336***
	(0.0172)	(0.0146)
Number of children 14-18	0.335***	0.212***
	(0.0158)	(0.0122)
Foodstamp	0.908***	-0.706***
	(0.0332)	(0.0422)
Welfare	0.000737	-0.0565
	(0.0531)	(0.0632)
Medicaid	1.030***	0.0922***
	(0.0198)	(0.0193)
Unemployed	0.269***	0.159***
	(0.0468)	(0.0371)
Part-time	0.0671**	0.0756***
	(0.0296)	(0.0255)
Full-time	-0.0458*	0.220***
	(0.0248)	(0.0208)
Urban	-0.441***	-0.252***
	(0.0405)	(0.0333)
Constant	1.622***	-1.803***
	(0.127)	(0.166)
Pseudo log-likelihood	-129,489.37	
Pseudo R^2	Not available	
Observations	123,241	

Table reports multinomial probit model estimates with "No Subsidized Lunch" as the reference outcome. State and year fixed effects are included. Standard errors are estimated using replicate weights (Fay's method). *** p<0.01, ** p<0.05, * p<0.1

Source: U.S. Census Bureau, Current Population Survey, 2006-2010 Annual Social and Economic Supplement. For information on sampling and nonsampling error, see <www.census.gov/apsd/techdoc/cps/cpsmar10.pdf>.

Table 5: Probit Model for WIC, CPS ASEC 2006-2010

VARIABLES	WIC
Age	-0.0177***
	(0.000795)
White, non-Hispanic	-0.0629*
	(0.0342)
Black, non-Hispanic	0.0418
	(0.0392)
Hispanic	0.294***
	(0.0363)
Female	0.0455***
	(0.0159)
Medium education	-0.0840***
	(0.0185)
High education	-0.566***
	(0.0723)
Widowed	0.112***
	(0.0390)
Past married	-0.0275
	(0.0232)
Never married	-0.000703
	(0.0207)
ln(household income)	-0.0273***
	(0.00441)
Household size	0.00659
	(0.00578)
Number of children 5-10	0.715***
	(0.00961)
Foodstamp	0.446***
	(0.0210)
Welfare	0.153***
	(0.0273)
Medicaid	0.820***
	(0.0179)
Unemployed	0.0754**
	(0.0299)
Part-time	0.0468*
	(0.0250)
Full-time	-0.0211
	(0.0197)
Urban	-0.149***
	(0.0227)
Constant	-1.452***
	(0.0972)
Pseudo log-likelihood	-34982.49
Pseudo R^2	0.45
Observations	190,633

Table reports probit model estimates. State and year fixed effects are included. Standard errors are estimated using replicate weights (Fay's method). *** p<0.01, ** p<0.05, * p<0.1

Source: U.S. Census Bureau, Current Population Survey, 2006-2010 Annual Social and Economic Supplement. For information on sampling and nonsampling error, see <www.census.gov/apsd/techdoc/cps/cpsmar10.pdf>.

Table 6: Probability of School Lunch and WIC Program Participation Using Model Estimation

Program	2006 ASEC	2007 ASEC	2008 ASEC	2009 ASEC	2010 ASEC	2006-2010 ASEC
School Lunch Model						
Subsidized Lunch, FR	23.7%	23.5%	22.8%	24.0%	26.4%	24.1%
Subsidized Lunch	45.3%	44.7%	44.2%	43.7%	42.6%	44.1%
No Subsidized Lunch	30.9%	31.8%	33.0%	32.3%	31.0%	31.8%
WIC Model	3.4%	3.3%	12.5%	13.0%	13.6%	

Source: U.S. Census Bureau, Current Population Survey, 2006-2010 Annual Social and Economic Supplement. For outcomes, "Subsidized, FR" refers to receiving a subsidized lunch with a free or reduced Price, "Subsidized Lunch" refers to receiving a subsidized lunch, and "No Subsidized Lunch" refers to not receiving a subsidized lunch. For information on sampling and nonsampling error, see <www.census.gov/apsd/techdoc/cps/cpsmar10.pdf>.

Table 7: Probability of School Lunch and WIC Program Participation Using Reported Participation

Program	2006 ASEC	2007 ASEC	2008 ASEC	2009 ASEC	2010 ASEC	2006-2010 ASEC
School Lunch						
Subsidized Lunch, FR	25.3%	25.1%	24.5%	26.0%	27.9%	25.7%
Subsidized Lunch	44.0%	43.3%	42.7%	42.1%	41.3%	42.7%
No Subsidized Lunch	30.8%	31.6%	32.8%	31.9%	30.8%	31.6%
WIC	3.0%	3.0%	11.9%	12.7%	13.2%	

Source: U.S. Census Bureau, Current Population Survey, 2006-2010 Annual Social and Economic Supplement. For outcomes, "Subsidized, FR" refers to receiving a subsidized lunch with a free or reduced Price, "Subsidized Lunch" refers to receiving a subsidized lunch, and "No Subsidized Lunch" refers to not receiving a subsidized lunch. For information on sampling and nonsampling error, see <www.census.gov/apsd/techdoc/cps/cpsmar10.pdf>.