III. METHODOLOGY

This chapter describes our methodology for conducting the empirical analysis presented in Chapters IV-VI, including the conceptual approach, the data source, the method for approximating eligibility in the FSP, and the samples examined.

A. Conceptual Approach

Our conceptual approach to the empirical analysis conducted in this report is in the spirit of Friedman's well-known "permanent income hypothesis" (Friedman 1957). Friedman hypothesized that "permanent income" (i.e., expected long-term income) is a stronger predictor of consumption than current income. He argued that transitory shocks to income (i.e., deviations of current income from expected long-term income), whether positive or negative, only affect consumption to the extent that they affect the consumer's expectations about permanent income. Consumers are hypothesized to smooth out the effects of transitory good or bad fortune on consumption over a long period.

One important aspect of the permanent income hypothesis has substantial empirical support in the consumption literature. The hypothesis predicts that, after controlling for current income, current consumption will depend positively on past and future income, as well, and many studies have found such relationships. However, some studies also find evidence that "finance constraints" limit consumer ability to make consumption decisions based solely on permanent income; i.e., many have limited ability to borrow against higher future income, and some cannot accumulate sufficient savings during relatively high-income periods to maintain their consumption in low-income periods. This might be why, for instance, some empirical studies have found positive relationships between predictable changes in income and consumption, contrary to what the permanent income hypothesis would predict.[10] We would expect finance constraints to be particularly important for households with relatively low permanent incomes. Even so, however, as long as some households with temporarily low income are able to consume more than their current income would suggest because of higher long-term income, we would expect to find a positive relationship between current consumption and past and future income, holding current income constant.

Although long-term income expectations of households are not observed, the relationship between consumption and long-term expected income can be estimated in various ways. One classical approach to estimation is to use past and future income as instrumental variables for current income in a regression of current consumption on current income.[11]

In the context of participation in FSP, there are many reasons to think that current participation among those identified as eligible in the SIPP is related to expected long-term household income, rather than current income only. While current household income is low enough to meet the income test, this might be a very transitory phenomenon. If we compare two

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[10] Parker (1999) reviews recent literature. See Deaton (1992) for a comprehensive presentation of the consumption literature.
[11] See, for instance, Deaton (1992).

households with identical current incomes, but different expected long-term incomes, the household with higher expected long-term income is less likely to participate in FSP, for three reasons:

- The household is likely to have more access to other resources, not measured in SIPP, that can be used to purchase food. If SIPP captured those resources accurately, the household might not pass the asset test. Even if the household did pass the asset test, the asset test itself might not fully capture the available resources;

- The cost of applying for and using food stamps, and the stigma associated with using them, is more likely to be a deterrent to participation for the household with higher expected long-term income;[12] and

- The household with higher expected long-term income is less likely to be aware of the availability of food stamps, perhaps because of less familiarity or contact with programs that serve low-income populations.

There is one other potentially important reason why current household income, as reported in the survey, might be substantially lower for apparently eligible households than expected long-term income: measurement error. Such errors could be random (simple response or recording errors on specific questions) or systematic (deliberate under reporting of income from certain sources). In the absence of such errors, the household might not meet the FSP income test.

Much of the analysis focuses on the cross-section relationship between the FSP participation rate and various measures of income, with income expressed as a percentage of the FPL. If measured income accurately reflected expected long-term income, we would expect to find a negative relationship, with relatively high participation rates for households with the lowest incomes, and much lower rates for households with incomes near the income ceiling (*Exhibit III.1*). The program's success in reaching the households with the lowest expected long-term incomes could be assessed by the size of the gap between 100 percent participation and actual participation for those households. If, unlike for the hypothetical case drawn, we found a large gap for the households with the lowest expected long-term incomes, policymakers would want to know more about why such households were not participating, and whether changes in the program to close the gap were warranted.

Unfortunately, we do not observe expected long-term income, and the cross-section relationship between the participation rate and the most readily observed measure of income – current reported income – might look quite different from the relationship between the participation rate and expected long-term income for the reasons listed above. When we are able to measure income in multiple periods, as in the SIPP, we can consider various ways of assessing the extent to which longer-term observed income affects the cross-section relationship between participation and current measured income. In fact, even though we can never observe expected

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[12] Any change of more than $25 in monthly gross income had to be reported to the FSP during the period of analysis examined for this report. More recently, states have been offered reporting options to lessen the burden on states and participating households.

long-term income, we can use indirect methods to assess the relationship between participation and expected long-term income.

Exhibit III.1: Hypothetical Relationship between FSP Participation and Expected Long-term Income
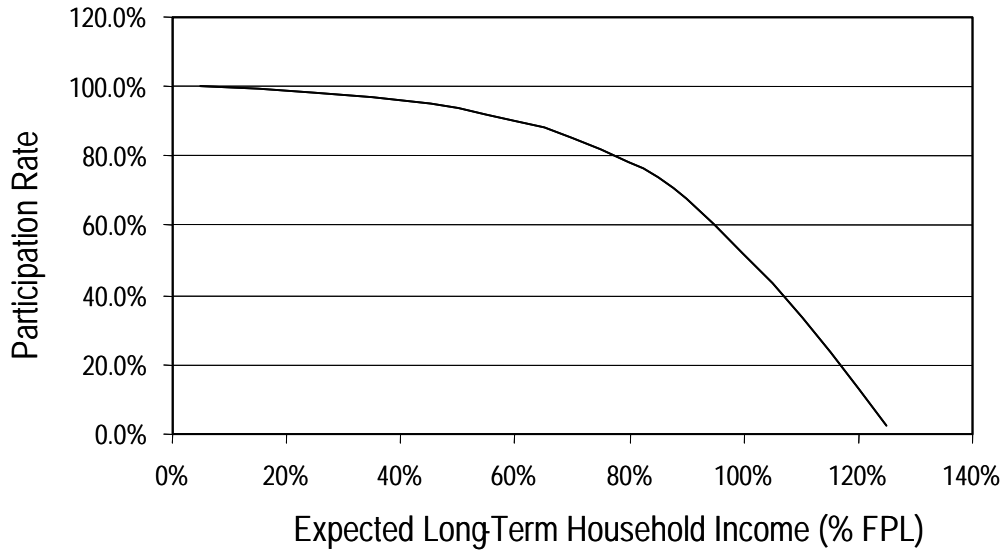
Thus, in Chapter V we will:

- Consider the cross-section relationship between participation and income measured over a 12-month period ("annual" income), rather than just the current month;

- Consider how past and future month income shifts the cross-section relationship between participation and current month income; and

- Present estimates of the relationship between the participation rate and expected long-term income, employing an instrumental variables method that has become a classic method in the consumption function literature.

In micro-data analysis of the relationship between consumption and income, the usual assumption is that the determination of income is exogenous to the determination of consumption. For the analysis of FSP participation, the corresponding assumption would be that income is determined exogenously relative to FSP participation. This assumption is suspect, however, because potential participants know that the size of FSP benefits is inversely related to income. Any decisions that affect income also affect food stamp eligibility and the potential value of food stamps. Hence, it seems more appropriate to think of FSP participation as jointly determined with current income.

Two other important conceptual issues arise in the examination of the cross-section relationship between FSP participation and income. One is that various observable characteristics of a household might affect participation, holding expected long-term income constant. For instance, we would expect ABAWD households to be less likely than other households to participate, at

least in part because of the special rules introduced in 1996. Such variables shift the participation rate/expected long-term income relationship up or down. As these variables might be correlated with expected long-term income, it is important to control for them when estimating the relationship between FSP participation and expected long-term income, and to consider how changes in their value shift the participation/expected long-term income relationship.

We would expect the same characteristics to affect participation rates, given any current income, but the observed relationship might be different because the characteristics themselves are related to the differences between measured and expected long-term income. For instance, given any value for current income, we would expect ABAWD households with well-educated heads to have higher expected long-term income than non-ABAWD households with less-educated heads. When we include such variables in the estimation of the cross-section relationship between FSP participation and current income, they likely capture some of the effect of expected long-term income on participation.

Second, there are many observable behaviors of a household that are likely to be affected by expected long-term income, as well as by other factors that might affect FSP participation. The most obvious of these is participation in other programs that the household might be eligible for, such as TANF, SSI and Medicaid. Such variables are considered endogenous to the FSP participation decision.

We do not include household participation in other programs or labor market variables in our analysis of participation. Such variables are likely to be strong predictors of participation, holding income constant, because they would surely capture much of the effect of expected long-term income, as well as other factors (e.g., participation costs), on participation. [13] However, from a policy perspective, it is much more useful to know how changes in an exogenous characteristic affect program participation, not controlling for the effects of this change on other behaviors (e.g., not holding participation in other programs constant). Put differently, if we know that households are less likely to participate in FSP if they do not participate in other programs, holding other things constant, that only suggests that the cause for non-participation in FSP might be the same as the cause for non-participation in other programs; it does not tell us what the cause is. If we control for participation in other programs we will clearly misrepresent the extent to which a household's participation is determined by its income prospects and other exogenous factors. A more complete analysis would examine joint determination of participation in multiple programs.[14]

It is also important to recognize that current income itself is endogenous, because households presumably understand that increasing their income, perhaps through increased earnings, will normally reduce the value of the household's food stamp benefit. Put differently, a change in any exogenous factor that induces a household to participate in FSP potentially induces the household to reduce its income, because food stamps will now partially replace the lost income.

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[13] Moffitt and Fraker (1989) find particularly strong labor supply effects of food stamps for unmarried adults without children. They cite evidence of much smaller, but still significant, effects for other households.

[14] See, for instance, Blank and Ruggles (1996) for a joint analysis of participation in AFDC and FSP.

Although we often discuss the relationship between participation and income as if causality is from income to participation only, we recognize that current income is endogenous to current participation. Income in other periods, and expected long-term income, might more reasonably be assumed exogenous to current participation.

B.   Data

As mentioned above, we have used the 1996 SIPP to conduct all of the analysis presented in this report. The 1996 SIPP survey asked questions on income, labor force participation, program participation, and general demographic characteristics. The "core" survey is broken into 12 waves, with each wave conducted every four months for a total of 48 months. In addition to the core content, the SIPP also asks questions on a variety of topics in particular waves. These are referred to as "topical modules" and cover such topics as child- and adult-well-being, assets and liabilities, child care, child support, disability, and health care. For the purposes of our study, in addition to the information from the core, we examined information from the Assets, Liabilities and Eligibility; Migration History; Medical Expenses and Utilization of Health Care; and Child Care topical modules to determine the food stamp eligible population.

For the analysis presented in this report, we rely on the longitudinal research files. For these files, the Census Bureau uses the information from other months to impute missing values for households in a specific month. However, it does not impute values for data missing due to household attrition. In the first month of the 1996 panel, there were 36,730 households surveyed. By the end of the panel, 25,886 households remained in the survey. Because information (primarily earnings and income data) spanning the entire 48-month panel period is needed, we only included in our research samples those households that appeared in the research universe for the entire 48-month period.[15] As discussed later, this likely has some effects on the findings.

Another area of concern was the "seam bias" in the SIPP, which is the uneven distribution of changes between the last month of one interview and the first month of the next interview because of recall error. While the introduction of the computer-assisted personal interviewing (CAPI) instrument in 1996 was hypothesized to reduce some of this bias in the SIPP, we observed larger changes in outcomes such as earnings and income between waves than within the waves. For analysis presented in Chapter V, we examined the relationship between food stamp participation and annual income, which reduces some of the seam bias found in the monthly income variables.

C.   Eligibility Determination

As discussed in Section II.A, in order for one to qualify for food stamps, one must meet certain criteria established by the Food and Nutrition Services (FNS). To determine our research sample, we attempted to replicate those eligibility criteria. Essentially, households must pass

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[15]   All analysis presented in this report have been weighted using the person-level weights associated with the individual designated as the head of household.

three tests – the gross income, net income, and asset tests. These tests are outlined in the shaded box.[16]

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Determining Food Stamp Eligibility

- **Apply Gross Income Test:** The household's gross income must be less than 130% of the poverty line.[17]

- **Apply Net Income Test:** The household's net income must be less than 100% of the poverty line. Net income is calculated by subtracting the following deductions from gross income.[18]

  Gross Income
  - 20% Earned Income Deduction
  - $134 Standard Deduction
  - Dependent Care Deduction
  - Medical Cost Deduction
  - Child Support Deduction
  - Excess Shelter Deduction
  Net Income

  Note that the dependent child deduction is equal to $200 for each child under 2 years old and $175 for all other dependents and the medical cost deduction is limited to elderly or disabled members who have costs exceeding $35 a month. The excess shelter deduction is calculated by subtracting the adjusted income divided by two from the sum of utility costs and rent or mortgage payments and real estate taxes. If this amount is positive, the excess cost is deducted up to a maximum of $134, unless there is an elderly or disabled member of the household, in which case there is no limit to the size of the deduction.

- **Apply Asset Test:** The household's assets must be less than $2,000 when there are no elderly people in the home or less than $3,000 if there are elderly people in the household. Starting in 2002, this higher limit applied to households with disabled individuals; we applied the $2,000 limit for these households, reflecting the rules in place in 1997.

  Part of the challenge of replicating the asset test is assessing the value of household vehicles. Cars are valued differently depending on the purpose for which they are used. If the car is being used for work or training, then the car is valued at the fair market value over $4,650; if used for other purposes, it is valued at the fair market value over $4,650 *or the equity value*, whichever is greater. Other restrictions apply.[19]

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[16] Certain individuals are categorically ineligible for food stamps. These include full-time students, people on strike, and certain immigrants. We only excluded immigrants from our research sample.

[17] Households with an elderly person or a person who is receiving certain types of disability payments only has to meet the net income test.

[18] For a more detailed discussion of deductions, see : http://www.fns.usda.gov/fsp/.

[19] For a more detailed explanation of the car test, see (http://www.fns.usda.gov/fsp/MENU/APPS/ELIGIBILITY/ resources/resources.htm).

In order for us to predict eligibility, we identified certain types of households that face different eligibility criteria. These are households which include elderly and disabled members, non-citizens, and categorically eligible members. Assumptions were made regarding these populations, as well as other assumptions discussed below, primarily due to limitations in the SIPP data.

1. Identifying Elderly and Disabled Members

Households with elderly and disabled members have less restrictive eligibility requirements, when compared to households without such members as discussed in the text box. For all analysis, we define elderly and disabled in a manner that is similar to FNS's definition. A person is elderly if he or she is 60 years of age or older. A person is considered to be disabled for food stamp eligibility purposes if he or she meets any if the following criteria:

- Receives Federal disability or blindness payments under the Social Security Act, including Supplemental Security Income (SSI) or Social Security disability or blindness payments; or

- Receives state disability or blindness payments based on SSI rules; or

- Receives a disability retirement benefit from a governmental agency because of a disability considered permanent under the Social Security Act; or

- Receives an annuity under the Railroad Retirement Act and is eligible for Medicare or is considered to be disabled based on the SSI rules; or

- Is a veteran who is totally disabled, permanently housebound, or in need of regular aid and attendance; or

- Is a surviving spouse or child of a veteran who is receiving VA benefits and is considered to be permanently disabled." [20]

An additional requirement that we cannot observe is the clause in the food stamp regulation stating that an eligibility worker can make the determination of disability if the applicant is visibly disabled, and not receiving income from any of the above sources. Because we cannot make that determination, we also define persons as disabled if they state on the SIPP that they have a physical or mental limitation that prevented them from working in the month.

2. The Categorically Eligible

If a household is comprised entirely of TANF and/or SSI recipients (i.e., every individual in the household is receiving either TANF or SSI), then the household is considered to be "categorically eligible" for food stamps and the income and asset tests are not conducted. In most cases, it is the asset determination that might make someone eligible for TANF, but ineligible for food stamps, if the tests were applied. The SIPP identifies the household members who are on each grant. From this information, we determined households that were categorically eligible and included them in the sample, regardless of the value of their income and assets.

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[20] For more information, please see: http://www.fns.usda.gov/fsp/rules/Elderly_Disabled.htm.

3. Aliens

The criteria for assessing eligibility of immigrants is complicated and changed over the period covered by this period. Certain non-citizen groups are eligible for food stamps (e.g., members of Hmong or Highland Laotian tribes, Haitian refugees, those claiming political asylum and other refugees). In addition, Lawful Permanent Residents (LPRs) are qualified after they have earned, or could be credited with, 40 quarters of work; for LPRs who might have less than 40 quarters of work, they are eligible after being in qualified status for 5 years. Also, children less than age 18 are eligible, assuming they were living lawfully in the U.S. in August 1996. Public Law 105-185 restored benefits to some of these immigrants in 1998 (including child, disabled, and elderly immigrants).

Due to limitations of the SIPP data and because the rules changed over time, we included in our sample only those households that had at least one U.S. citizen. For families consisting of food stamp aliens and U.S. citizens, we simply pro-rated the total household income to all members of the household, and included only the prorated income of the citizens' income to determine eligibility for the new food stamp household (consisting only of U.S. citizens). We made these simplifications so that we could examine participation over time for a group of households that faced the same eligibility criteria over the four-year follow-up period.

4. Assumptions Made in Estimating Eligibility

Given the limitations of the SIPP, we had to make additional assumptions to construct a population of food stamp eligible households.

- **The SIPP household was the same as a food stamp household.** The SIPP defines the household as a collection of people who live *or* eat together, whereas the food stamp household includes people who live *and* eat together. Therefore, our population may not reflect the actual number of food stamp households because multiple food stamp households may exist in one SIPP household.

- **Household composition, household expenditures, and citizenship status did not change much over time.** We estimated eligibility at two points in time: Wave 3, Month 4 (sample members were interviewed between November 1996 and February 1997) and Wave 9, Month 4 (sample members were interviewed between November 1998 and February 1999). Some information was only available from topical modules in other waves, although generally, in the same year. This included information on child care expenses, medical expenses, and citizenship.

- **The head of the SIPP household was the head of the food stamp household.** If the SIPP household had multiple families, or food stamp households, our assumption may mischaracterize the attributes of the head of the household. The attributes include sex, race, ethnicity, age, marital status and education levels.

- **If there is only one car per person, the household was using that car to go to work or school.** As discussed in the text box, cars are valued differently depending on the purpose for which they are used. We assumed that one car per person was being used for work or training. If used for other purposes, the car could have been assigned a greater asset value. Using this assumption, we might have underestimated the resources of some households.

- **When computing child care deductions, simplifying assumptions were made.** The food stamp program allows families to deduct child care costs for each child in the household up to a maximum deduction, with the allowable deduction based on the age of the child. We deducted the entire child care costs for the household, as long as this total cost was under the maximum deduction allowed, assuming all children in the household received care.

D.   Samples

The samples used for this report cover two types of households: (1) low-income households (LIHH) reporting income less than 130 percent of poverty, and (2) households meeting the food stamp eligibility (FSE) criteria, as discussed above.[21] In addition, we defined these two households at two different points in time: month 12 (wave 3, month 4) and month 36 (wave 9, month 4). These two months were picked because detailed information about a household's assets is reported in the topical modules associated with waves 3 and 9. These households are denoted as LIHH-12, LIHH-36, FSE-12, and FSE-36.

For some analysis, we also consider three additional samples with very low income, defined as being food stamp eligible and having gross income less than 75% of the FPL: 1) those with very low income in month 12 (poor-12); 2) those reporting very low income in month 36 (poor-36); and 3) those with very low incomes in both months 12 and 36. The latter sample, referred to as "persistently very poor households" (PPoor-12 and -36), represents the most disadvantaged households among our samples.

Exhibit III.2 presents selected characteristics of sample members in each of the nine samples, in the month when their low-income or eligibility status was assessed. For the samples consisting of households meeting the criteria in both months 12 and 36, we examined their characteristics at the two points in time and any differences are due to changes they experienced between 1996 and 1998. [22]

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[21] Throughout this report, we use the term "income" to include all cash income. Food stamp benefits and other in-kind assistance are not included.

[22] Note that while the persistently very poor household samples consist of the same households for month 12 and 36, the characteristics reflect those in the respective month. Because we defined the household head as either the SIPP reference person or, if this person is not between the ages of 18 and 50 in the given month, the oldest person within this age group, the household head might have changed from month 12 and 36. This results in slight differences in the static characteristics of the household head. Differences in the dynamic characteristics reflect changes over time, as well.

Exhibit III.2: Characteristics of Research Samples
(Percent of Household Group, Unless Otherwise Noted)

Head of Household Characteristics	Low-Income Households		Food Stamp Eligible Households		Very Poor Households		Persistently Very Poor Households	
	LIHH-12	LIHH-36	FSE-12	FSE-36	Poor-12	Poor-36	PPoor-12	PPoor-36
Sex								
Male	42.7	43.9	38.5	39.5	33.1	37.5	29.4	29.1
Female	57.3	56.1	61.5	60.5	66.9	62.5	70.5	70.9
Race								
White	74.9	73.1	68.8	67.9	64.6	65.4	58.1	58.1
Black	20.7	21.9	26.8	27.2	30.6	39.9	37.2	37.2
Native American	2.0	2.1	2.1	2.5	2.1	2.2	2.4	2.4
Asian	2.3	2.8	2.3	2.4	2.6	2.5	2.3	2.3
Ethnicity								
Hispanic	14.6	15.3	17.1	17.8	18.9	20.1	22.9	22.9
Age								
18-24	10.4	5.5	10.6	6.1	10.3	5.6	9.8	6.0
25-34	29.1	26.3	30.7	27.6	31.4	26.0	28.0	25.4
35-44	31.7	34.0	32.5	34.2	33.1	34.1	33.0	34.0
45-88	28.8	34.2	26.1	32.0	25.1	34.3	29.1	34.5
Marital Status								
Never married	29.6	27.2	32.8	30.8	35.9	33.9	38.8	38.2
Married	40.9	40.0	35.6	33.3	30.6	28.5	23.4	23.5
Divorced/separated	26.3	28.8	28.6	32.3	30.6	33.2	34.5	34.7
Widowed	3.2	3.9	3.0	3.7	2.9	4.3	3.3	3.6
Education Levels								
Less than high school	28.3	28.7	34.9	35.9	37.9	39.1	45.7	44.8
High school graduate/GED	36.4	34.7	35.9	35.7	35.7	34.1	33.9	34.1
Trade/vocational school	4.3	4.2	3.7	3.7	3.4	2.9	2.8	3.0
Some college	17.1	17.0	15.8	15.5	15.6	14.9	12.4	12.5
College graduate	13.9	15.4	9.6	9.1	7.4	9.0	5.1	5.6

Exhibit III.2: Characteristics of Research Samples (continued)

Household Characteristics	Low-Income Households		Food Stamp Eligible Households		Very Poor Households		Persistently Very Poor Households	
	LIHH-12	LIHH-36	FSE-12	FSE-36	Poor-12	Poor-36	PPoor-12	PPoor-36
Household Composition								
Average adults (#)	1.7	1.8	1.7	1.8	1.5	1.6	1.4	1.5
Average children (#)	1.4	1.4	1.5	1.5	1.6	1.5	1.6	1.6
Person with disability	15.0	15.2	24.4	21.2	24.5	23.9	33.0	33.5
Elderly member	10.9	12.1	14.1	13.7	8.4	9.3	9.1	9.7
ABAWDs only	17.7	15.9	12.9	14.4	13.2	15.6	10.8	9.4
Number of Children								
No children	38.2	39.9	35.5	38.2	34.2	41.7	38.0	39.5
One child	19.1	16.5	19.1	17.5	17.5	15.2	15.6	16.1
Two or three children	34.2	34.6	34.6	34.0	36.4	31.7	34.1	31.5
Four or more children	8.5	9.0	10.8	10.2	11.9	11.3	12.2	12.7
Youngest Child's Age								
1 year and under	14.2	11.1	15.1	12.4	15.6	12.1	15.0	11.7
2 to 4	15.8	15.0	17.2	15.6	18.2	14.3	19.5	15.7
5 and over	31.8	34.0	32.8	33.8	31.9	31.9	27.5	33.0
Benefits								
Cash Assistance								
SSI	24.4	27.2	32.2	32.7	30.2	34.7	40.2	43.3
TANF	14.5	9.4	23.4	12.9	31.9	17.9	38.8	24.5
General assistance	2.9	1.1	3.8	1.5	4.3	1.9	5.2	2.6
Other assistance	0.6	0.3	0.9	0.4	0.9	0.1	1.1	0.0
TANF in past 12 months	15.8	16.3	24.7	21.6	32.5	28.0	39.4	38.0
Other Benefits								
Housing assistance	15.2	14.2	21.1	19.3	28.6	25.5	36.1	35.7
WIC	15.2	13.1	19.1	15.6	20.8	16.3	23.2	18.6
Medicaid	43.9	41.0	59.1	53.2	68.1	62.6	79.9	76.8
Medicare	13.4	15.6	16.9	18.0	12.5	16.1	14.0	16.6
Sample Size	**3387**	**3111**	**1994**	**2182**	**1085**	**1079**	**544**	**544**

NOTE: LIHH-12 and -36 samples have gross income less than 130% FPL in month 12 and month 36, respectively; FSE-12 and -36 samples meet the FSP eligibility criteria in the respective month; Poor-12 and -36 samples meet the eligibility criteria and have gross income less than 75% FPL in the respective month; PPoor-12 and -36 meet the eligibility criteria and have gross income less than 75% FPL in both months 12 and 36 (the statistics reflect those for month 12 or 36).

The numbers of SIPP households with complete data for 48 months and with reported income below 130 percent of FPL or categorically eligible in months 12 and 36, respectively, are 3,387 and 3,111. Of these, 1,994 and 2,182, respectively, passed the simulated eligibility test. Of the households that passed the eligibility test, 1,085 and 1,079, respectively, had reported income that fell below 75 percent of FPL. Finally, among the latter households, 544 were poor in both months 12 and 36.

The first group of characteristics pertains to the heads of the households. Compared with the low-income households, the food-stamp eligible and very poor household heads are more likely to be female, black, Hispanic, and not married. Also, they have lower levels of education. These more disadvantaged households are more likely to have a household member with a disability.

For each type of household, characteristics for samples defined in month 12 and 36 are very similar. Because of the points in time in which the samples were surveyed, the mean age for the month-36 samples is about two years higher than for the month-12 samples. However, the month-12 samples differ from the month-36 samples in one important way: the month 36 samples had lower rates of participation in TANF in the reference month than the month 12 samples, but similar rates of TANF participation in the past year. This implies that the month-36 samples had higher shares of households that were on TANF, but left the program within the past 12 months. This corresponds to a decline in TANF caseloads nationally – between January 1997 and January 1999, TANF caseloads decreased by 34 percent.