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Contract No.: 53-3198-6-017
MPR Reference No.: 8370-003

PREDICTING FOOD STAMP PROGRAM ELIGIBILITY USING SURVEY DATA: WHAT INFORMATION IS NEEDED?

July 3, 1997

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ACKNOWLEDGMENTS

Many people provided valuable assistance in the preparation of this report. Sara Yang provided expert research assistance. Bruce Schecter, Mike Stavrianos, and Nancy Wemmerus answered many questions about the FSP eligibility standards, SIPP, and the MATH® SIPP model. Carole Trippe commented on an earlier draft of this report. Micki Morris and Felita Buckner produced the report.

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EXECUTIVE SUMMARY

prediction errors would be made for only 1.1 percent of all households. However, collecting information on assets requires questions about the value of vehicles and financial assets.

- Fairly good predictions of FSP eligibility can be made with information on just financial assets and gross income. Prediction errors would be made for only 2.9 percent of households. But questions about financial assets are both sensitive, and difficult, because respondents have to remember and add up the value of each asset.

- The largest "bang for the buck" comes from collecting information on vehicles. If information on vehicle assets is available, errors predicting FSP eligibility would be made for only 3.7 percent of all households. Although the prediction errors are larger than if data on financial assets are collected, collecting information on the value of vehicles requires only straightforward and nonthreatening questions. Because most respondents do not know the value of their vehicles, information on the *value* of vehicles is usually collected by asking about the make, year, and model of the vehicles and finding their market prices from published lists.

- The choice of survey questions depends on whether a prediction of FSP eligibility is to be made during the interview (as a screening criteria, for example) or by a researcher at a later date. For example, it is currently infeasible to find the market price of a vehicle quickly enough given its make, year, and model to use this information during the interview.

- Reasonable predictions can be made using the age of the household's vehicles rather than their value, and this information can be used to predict FSP eligibility during the interview. With information on the age of the household's vehicles, gross income, household size, and whether the household contains an elderly person, errors in predicting FSP eligibility would be made for 4.6 percent of all households.

- Even better predictions can be made using information on whether the value of financial assets exceeds a threshold in addition to the age of the household's vehicles. With this information, predictions of FSP eligibility would only be incorrect for about 2.1 percent of all households. If the prediction of FSP eligibility needs to be made during the interview the prediction errors cannot be reduced much further. However, if the prediction of FSP eligibility does not need to be made during the interview, prediction errors can be reduced by nearly half, to 1.1 percent, by also collecting information on the make, year, and model of the household's vehicles.

- Predicting FSP eligibility is most difficult for households with elderly persons, households with disabled persons, and households without earnings.

FCS is currently considering questions to include in the Continuing Survey of Food Intakes by Individuals (CSFII). The following are our findings about errors that would be made predicting FSP eligibility using the CSFII:

- The information currently collected by the CSFII allows fairly good predictions of FSP eligibility. Errors in predicting FSP eligibility would be made for only 2.9 percent of all households. About 12 percent of all households predicted to be FSP eligible would actually be ineligible, and about 5 percent of all FSP-eligible households would be predicted to be ineligible.

- The best way to further reduce the errors in predicting FSP eligibility made using the CSFII further would be to add questions about vehicles. With additional information on vehicles, errors in predicting FSP eligibility would be made for only 1.1 percent of all households.

- If cost and burden considerations mean that information on financial assets could no longer be collected by the CSFII, the errors in predicting FSP eligibility would approximately double in size.

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I. INTRODUCTION

To address many research questions of policy interest, the Food and Consumer Service (FCS) of the U.S. Department of Agriculture (USDA) needs information about households that are eligible for Food Stamp Program (FSP) benefits. Therefore, it is important to be able to identify FSP-eligible households using survey data. However, this requires a lot of detailed, often sensitive, information. Collecting all the necessary information would make most surveys too long and place too much burden on the respondent.[1] The challenge is to design a small set of survey questions that can be used to make good, although not perfect, predictions of FSP eligibility without placing a large burden on the respondent.

The purpose of this report is to help FCS design survey questions that collect information needed to predict FSP eligibility given constraints about the number and type of questions that can be included in the survey. Our basic approach is to estimate the errors that would be made when predicting FSP eligibility with different sets of information. We estimate these errors with data from the Survey of Income and Program Participation (SIPP) and the FSP-eligibility determinations made by the MATH® SIPP model, a microsimulation model developed by Mathematica Policy Research, Inc. We show how the errors that occur predicting FSP eligibility change when different sets of information are used. Knowledge of these prediction errors will help FCS make more informed decisions about which questions to include in surveys to predict FSP eligibility.

The Continuing Survey of Food Intakes by Individuals (CSFII) conducted by the Agricultural Research Service of the USDA collects information on dietary intake, program participation, and some socioeconomic characteristics and is often used by FCS to investigate issues relevant to the

[1]As about 31 percent of FSP-eligible households do not participate in the program (Stavrianos, 1997), this population cannot be identified from program records.

FSP. The content of the next version of the CSFII is currently under consideration. This report estimates the errors in determining FSP eligibility that would be made using the information currently collected by the CSFII. It also estimates the degree to which the errors would increase if asset information was not collected by the CSFII and suggests questions that could be added to the CSFII to reduce the errors in predicting FSP eligibility.

Chapter II of this report describes the information needed to predict FSP eligibility and issues that arise in its collection. Chapter III describes the methodology underlying the analysis in this report. Chapter IV presents estimates of the errors that would occur using different sets of information to predict FSP eligibility. We discuss the implications of our findings for the design of questionnaires in Chapter V. Chapter V also discusses the specific issue of the best way to predict eligibility using data currently collected by the CSFII, what the errors would be, and how the errors would increase if asset information was not collected by the survey. It also suggests questions that could be added to the CSFII to reduce the errors made in predicting FSP eligibility.

II. INFORMATION NEEDED TO PREDICT FSP ELIGIBILITY AND ISSUES IN ITS COLLECTION

This chapter describes the information needed to predict FSP eligibility and discusses some issues related to its collection. We begin by summarizing the FSP-eligibility standards. We then describe the information needed to apply those standards. Finally, we describe the issues that arise in the collection of this information.

A. THE FSP ELIGIBILITY STANDARDS

The Food Stamp Act of 1977, as amended, established national eligibility standards for the FSP. An FSP caseworker reviews the applicant's application form and other documentation and conducts an interview with the applicant (or an authorized representative) to determine whether the applicant meets those standards. The standards are complicated--the detailed federal regulations that describe the eligibility standards comprise nearly 100 pages of fine print. An overview of the standards follows:

The food stamp beneficiary unit, the "household," is generally defined as individuals who live together and customarily purchase food and prepare meals together. In some circumstances, elderly persons who need care from relatives can be counted as a FSP household apart from the relatives with whom they eat.

Most households are subject to three financial eligibility standards:

- ***Gross Income Standard.*** Monthly gross counted income must not exceed 130 percent of the federal poverty level. Counted income includes earned income, Temporary Aid to Needy Families (TANF), other public assistance benefits, social security and other retirement benefits, and income from interest and dividends. Households with elderly or disabled persons are not subject to this standard.

- ***Net Income Standard.*** Monthly net counted income must not exceed 100 percent of the federal poverty level. Counted income is equal to monthly gross income minus up to five allowable deductions:

  - A standard deduction of $134 for the continental U.S.
  - An earnings deduction of 20 percent of earned income
  - Out-of-pocket costs of dependent care related to the household member working, training, or going to school, up to a maximum per month
  - Medical expenses of elderly or disabled persons exceeding $35 per person
  - Shelter costs in excess of 50 percent of remaining gross income after applying other deductions, subject to a cap of $250 in the continental U.S.
  - Any legally-owned child support payments made by a noncustodian parent of a child living outside the food stamp household

- ***Asset Standard.*** Countable assets of most household must not exceed $2,000. Countable assets of households with elderly persons must not exceed $3,000. Countable assets include cash, checking and savings accounts, stocks and bonds, and most retirement accounts. Countable assets also include vehicles if the vehicle is not used to produce income or transport disabled persons. Vehicles are generally valued at the fair market value (as listed in the "blue book" of vehicle prices) minus $4,650. If a household owns more than one vehicle, all vehicles other than the primary vehicle that are not used to commute are valued at the greater of (1) the fair market value minus $4,650 and (2) the equity value of the vehicle.

These three eligibility standards differ slightly by household. If all members of the household receive public assistance--TANF (previously AFDC), Supplemental Security Income (SSI), or General Assistance--the household is categorically eligible for food stamp benefits and need not pass these three eligibility standards. Households that contain an elderly person (defined as 60 years of age or older) or a disabled person (defined as a person who receives certain benefits because of their disability) must meet only the net income and asset standards and *not* the gross income standard.[1]

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[1]A person is defined as "disabled" for the purposes of determining FSP eligibility if they receive (continued...)

Also shelter deductions are not capped for elderly or disabled households. Elderly households can have countable assets of as much as $3,000 and still be eligible for FSP benefits.

Other eligibility rules may deny households eligibility for the FSP. Two important new rules are (1) the work requirement and (2) the citizenship requirement, both of which were introduced by the Personal Responsibility and Work Opportunity Reconciliation Act of 1996 (PRWORA). Other persons excluded from FSP eligibility are: individuals on strike unless they were eligible prior to going on strike, most persons in institutionalized settings, certain students, and those who intentionally violate program rules.

To be eligible for FSP benefits under the work requirement rule, a person who received food stamp benefits for three or more months (consecutive or otherwise) during the preceding 36-month period must have done one of the following while receiving food stamp benefits: (1) worked 20 or more hours per week, (2) participated in the workfare program, or (3) participated in a work program for 20 or more hours per week. Persons exempt from this provision include any person who is under 18 or over age 50, pregnant, medically certified as physically or mentally unfit for employment, a parent or other household member with responsibility for a dependent child, and any person who is exempt from FSP work registration. Also, USDA may waive the work requirement if the area where a person resides has insufficient jobs or an unemployment rate of 10 percent or higher.

Under PRWORA, nearly all persons who are not U.S. citizens are ineligible for food stamp benefits. Exceptions are made for the following: (1) permanent resident aliens who have worked in the U.S. for 40 or more quarters and their spouses and minor children, (2) permanent residential

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[1](...continued)
benefits related to disability, including federal or state SSI associated with a disability, and disability retirement benefits from a government agency for a disability that is considered permanent. Persons determined eligible to receive Medicare who also receive annuity payments under the Railroad Retirement Act, as well as veterans and the surviving spouse or child of a veteran, who are in need of regular aid and attendance are also considered disabled by the FSP.

aliens who are veterans or active duty members of the U.S. military and their spouses and minor children, and (3) aliens granted refugee status, political asylum, or a stay of deportation within the past five years.

B. INFORMATION NEEDED TO PREDICT FSP ELIGIBILITY

Although not exhaustive, Table II.1 lists most of the information needed to predict FSP eligibility. At a minimum, to make a credible prediction of FSP eligibility, information is needed on household size and gross income. (Household size is needed to determine the appropriate poverty threshold to use when applying the income standard.) Applying just the three eligibility standards requires twelve pieces of information about the household. And collecting many of these pieces of information requires more than one survey question. Examples of questions that collect this information are provided in Appendix A.

C. ISSUES IN COLLECTING INFORMATION NEEDED TO PREDICT FSP ELIGIBILITY

Designers of survey questions to collect information needed to predict FSP eligibility must consider three general issues. The "best" questions to ask in a survey will depend on trade-offs among these issues.

The first issue is how well the information collected by the questions can predict FSP eligibility. This report presents estimates of the errors that will be made to predict FSP eligibility with different sets of information.

The second issue is the likelihood that the questions will lead to nonresponse, either to the question or to the rest of the survey. Nonresponse is more likely if the questions pertain to sensitive issues such as income, assets, disability, and citizenship. However, these questions can be made

TABLE II.1

MAIN ITEMS OF INFORMATION NEEDED TO PREDICT
FSP ELIGIBILITY AND ISSUES IN THEIR COLLECTION

Information Item	Sensitivity	Issues in Its Collection
Household Size	Not usually sensitive	Difficult to replicate the rules defining the FSP household
Household Income	Sensitive--especially if question asks for amount rather than whether less than a threshold	Requires questions about each source of income if an accurate amount is needed. Otherwise, requires respondent to sum over all sources of income. Information on whether total income is less than a threshold amount is required if only a gross income rule is to be used.
Receipt of Public Assistance	Not usually sensitive	Straightforward question to ask
Age of Household Members	Not usually sensitive	Need only whether anyone in the household is 60 years of age or older if different rules are to be applied to elderly households. Need age of everyone in the household if work requirement rules are to be simulated.
Whether any Household Member is Disabled	May be sensitive	Question needs to ask respondents whether they receive benefits because of a disability. This is a difficult question.
Financial Assets	Very sensitive-- especially if question asks for amount rather than whether less than a threshold	Requires a question on each asset if an accurate amount is needed. Otherwise, requires respondent to sum over all assets. Need only ask whether total assets are less than a specified threshold.
Vehicle Assets	Not usually sensitive	Requires information about the market value of each vehicle, the equity value of all vehicles other than the primary vehicle, and the use of each vehicle. The market value of a vehicle can be estimated using values published in the Blue Book, if the age, make, and model of the vehicle are known.
Earnings	May be sensitive-- especially if question asks for amount rather than whether less than a threshold	Requires information on total earnings of all adult members of the household if net income rule is to be simulated.

TABLE II.1 (*continued*)

Information Item	Sensitivity	Issues in Its Collection
Medical Care Expenses for Elderly and Disabled Persons	Not usually sensitive.	Requires the respondent to understand what is meant by "elderly" and "disabled." Question needs to make clear which medical expenses are included. Requires information on the amount of out-of-pocket expenses if the net income rule is to be simulated. May be difficult for respondents to remember out-of-pocket expenses.
Dependent Care Expenses	Not usually sensitive.	The question must state that dependent-care costs include only those expenses incurred while the person is at work or in school or training and only out-of-pocket expenses. Requires information on the amount of expenses if the net income rule is to be simulated.
Shelter Costs	Not usually sensitive.	Shelter costs consist of rent, mortgage, property taxes, insurance payments, and utility expenses. Need to ask several questions for accurate information. Requires information on all shelter costs if the net income rule is to be simulated. Difficult for the respondents to recall.
Child Support Payments	May be sensitive.	Requires questions about child support that specify that the support is legally owed.
Citizenship	Very sensitive	Need to know how many people in the household are U.S. citizens.
Work and FSP Participation History	Not usually sensitive.	Need to know when in the previous 36 months a respondent participated in the FSP, whether they worked during that time, and how many hours they worked. Difficult for respondents to recall this information.

less sensitive by asking, for example, whether income or assets are less than a specific amount rather than asking for the *amount* of income or assets. And asking sensitive questions at the end of the questionnaire is less likely to lead to nonresponse because a rapport has developed between the interviewer and respondent. Also, a respondent refusing to complete the survey because of a specific question matters less if the offending question is near the end of the questionnaire.

The third issue is the number of questions that need to be asked to collect a piece of information and the resulting increase in survey costs and respondent burden. Some information, such as whether the household is elderly, can be assessed with just one short, simple question. Other information requires several complicated and lengthy questions. For example, it may be difficult for a household to calculate all its assets without spending time thinking about the value of each household asset. because it requires the respondent to think of every asset the household has and remember its value. At a minimum, collecting information on assets requires separate questions about the value of financial and vehicle assets.

Specific issues related to the collection of each type of information are listed in Table II.1.

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III. METHODOLOGY

This chapter describes the way we would estimate the errors that would be made predicting FSP eligibility using different sets of information. We begin by describing the SIPP and the MATH SIPP model. Section B provides an overview of our approach. Section C describes our analysis of the errors that are made when predicting FSP eligibility using survey data. Section D discusses some caveats to the analysis in this report.

A. SIPP AND THE MATH MODEL

The analysis in this report uses data from SIPP, is a nationally representative longitudinal survey of households in the U.S. that provides detailed monthly information on income, labor force activity, and program participation. Information on assets and expenses necessary to determine program eligibility is collected in topical modules. For this analysis, we combine Wave 7 of the 1992 SIPP panel and Wave 4 of the 1993 SIPP panel. This creates a cross-section sample of 37,101 households using information on January 1994.

The MATH SIPP model uses information from SIPP and the FSP eligibility standards to simulate whether each household in the sample is eligible for the FSP. The model replicates the actual FSP eligibility determination process by mimicking the work of an FSP caseworker as closely as possible.[1] It predicts that about 16 percent of the households in the January 1994 SIPP sample are FSP-eligible.

While SIPP contains more information than any other household survey, it does not contain everything necessary to replicate the eligibility determination process of an FSP caseworker. Seven limitations are noteworthy:

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[1]Details of the MATH SIPP model are provided in Sykes (1994).

1. ***Unit Definition***. SIPP does not provide all the information needed to determine which persons are in the food stamp unit as defined by the program. Specifically, it does not ask whether members of the household customarily purchase and prepare food together. Therefore, the simulated FSP household may differ from the actual FSP unit.

2. ***Countable Assets***. SIPP does not collect all the information necessary to calculate countable assets. For example, it does not collect information on the equity value of vehicles.

3. ***Gross Income***. The income definition used by the FSP differs slightly from that used by SIPP. For example, the FSP counts net self-employment earnings averaged over a period of up to one year, while SIPP measures monthly drawing from self-employment income.

4. ***Expenses***. SIPP definitions of shelter and dependent-care expenses used to compute net income differ slightly from FSP definitions.

5. ***Citizenship***. A SIPP topical module collects data on citizenship of adults, but not children. The MATH SIPP model does not currently use citizenship data to predict FSP eligibility.

6. ***FSP Participation and Work History***. SIPP collects information on each household for two and a half years. However, to determine whether a household meets the FSP work requirement rule, information is needed on the respondent's FSP participation and work history over the previous 36 months.

7. ***Reporting Error***. As in all surveys, some information is reported incorrectly in SIPP.

B. OVERVIEW OF APPROACH

While no survey collects enough information to exactly replicate the decision made by a FSP caseworker to determine FSP eligibility, the SIPP comes closest. In this report, we estimate the errors that we would make predicting FSP eligibility if we used only a subset of the information collected by SIPP. We will assume that the MATH SIPP model, which uses all the data available from SIPP, predicts FSP eligibility perfectly, with no error. We also suppose that the households that responded to SIPP only answered a subset of the questions in the survey. Using just this subset

of information, we estimate the errors that we *would* have made predicting FSP eligibility if only those questions had been asked.

We begin by assuming that we have data on household size and income only. We then compare the set of households that are predicted FSP eligible using this subset of information with the set of households that are predicted FSP eligible using the MATH SIPP model. We repeat this exercise for other sets of information that could be collected.

C. ERRORS IN PREDICTING FSP ELIGIBILITY

Two types of error can be made when predicting FSP eligibility. First, we could predict incorrectly that a household is eligible for FSP benefits when in fact the household is not eligible. Second, we could predict incorrectly that a household is ineligible for FSP benefits when, in fact, the household is eligible.

The seriousness of each error depends on the purpose of the data collection. In some contexts, such as investigating persons' attitudes about food stamp benefits, FCS may be interested in households that are low-income and "nearly" eligible for food stamp benefits in addition to FSP-eligible households. If this is the case, less emphasis should be placed on minimizing the first error. In other circumstances, such as investigating nonparticipation in the FSP, it may be more important to have a sample that includes only FSP-eligible households. In this case, more emphasis should be placed on avoiding the first error.

The errors made predicting FSP eligibility with a set of information depends on how the information is used. For example, if income is collected, the errors made predicting FSP eligibility depends on the income cutoff used. Selecting rules to simulate the FSP eligibility determination process requires a trade-off between the first and second type of error. Making the simulated eligibility rules more difficult to pass (by lowering the asset limit, for example) will decrease the

error of incorrectly predicting an FSP-ineligible household as eligible (the first error) while increasing the error of incorrectly predicting an FSP-eligible household as ineligible (the second error). In this report, we present estimates of both errors. These errors are presented as a percentage of all households represented in the sample (about 98 million).

To give a better understanding of the magnitude of the errors, we also present estimates of the percentage of households that we would predict FSP eligible that are actually ineligible. This answers the following question: "In a sample of households that we think are FSP eligible, what percentage are actually ineligible?" We also present estimates of the percentage of eligible households that we predict FSP-ineligible using the simple rules. This answers the following question: "What percentage of FSP-eligible households in the population could not be included in our sample of supposedly FSP-eligible households?"

D. CAVEATS TO THE ANALYSIS IN THIS REPORT

The analysis in this report estimates the errors predicting FSP eligibility relative to the errors made by the MATH SIPP model. To the extent that the MATH SIPP model predicts FSP eligibility incorrectly, the estimates of our errors in predicting FSP eligibility will be incorrect. The true errors in predicting FSP eligibility using most survey data are probably larger than the errors suggested by the analysis in this report. However, there is no reason to expect that the best simple rule to use with a given set of information or the relative importance of collecting different types of information would change if we knew which households were truly FSP eligible.

Since the data used in this analysis refer to a period before the PRWORA, we do not examine the benefits of collecting information on citizenship or the work requirements. Both types of information are difficult to collect in a survey. Citizenship is a highly sensitive topic that may lead to a great deal of misreporting or nonresponse. Collecting information on work and program

participation over the previous 36 months requires a long set of questions to establish when the household participated in the program, at which times they worked, the hours they worked, and their possible exemption from the work requirement. Adding these questions would lengthen a survey considerably. Both issues are potentially important in accurately predicting FSP eligibility in future surveys. Stavrianos, Cody, and Lewis (1997) estimate that about 5 percent of all FSP participants in fiscal year 1995 would be subject to the 3-month time limit and about 5 percent would be potentially affected by the citizenship requirements.

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IV. ERRORS IN PREDICTING FSP ELIGIBILITY USING DIFFERENT SETS OF INFORMATION

This chapter presents estimates of the possible errors predicting FSP eligibility using sets of information that could be collected by a survey. We begin by considering the errors in predicting FSP eligibility that would be made if information on only household income and size was available. We then present estimates of the prediction errors that would be made if more information was available.

The errors in predicting FSP eligibility depend not only on the information available but the way the information is used. For each set of information considered in this chapter, we present estimates of the errors made when we use different rules to simulate FSP eligibility with the information. We highlight the rule that minimizes the percentage of households for which the FSP eligibility prediction is incorrect.[1] This will be the "best" rule to use if the error of incorrectly predicting a FSP-ineligible household as eligible and the error of incorrectly predicting a FSP-eligible household as ineligible are equally important.

A. HOUSEHOLD SIZE AND INCOME

To be FSP-eligible, households that contain neither an elderly nor a disabled person must have gross income less than 130 percent of poverty. Elderly and disabled households are subject to the net income and asset test, but not the gross income test.

The errors in predicting FSP eligibility using only information on household size and gross income are presented in Table IV.1. The "best" simple rule to predict FSP eligibility, the rule that

[1]We considered income thresholds of 100, 120, 130,140, and 150 percent of poverty and asset thresholds of $500, $1,000, $1,500, $2,000, $2,500, and $3,000.

TABLE IV.1

ERRORS IN PREDICTING FSP ELIGIBILITY USING HOUSEHOLD SIZE AND INCOME

Gross Income Rule	Error 1: Percentage of Hsds Predicted Eligible When Actually Ineligible[a]	Error 2: Percentage of Hsds Predicted Ineligible When Actually Eligible[a]	Error 1 + Error 2
<=110% of poverty	3.9	3.0	6.8
<=120% of poverty	**4.6**	**1.8**	**6.4**
<=130% of poverty	5.8	0.8	6.6
<=140% of poverty	7.7	0.5	8.2
Percentage of hsds predicted FSP eligible that are actually ineligible			24.4
Percentage of FSP-eligible hsds that are predicted ineligible			11.3

SOURCE: January 1994 SIPP

[a]Households are assumed to be FSP eligible if they are predicted to be eligible using the MATH SIPP model.

Hsds = Households

minimizes the sum of the two errors, is to predict that all households with income not exceeding 120 percent of poverty are FSP eligible. This is a stricter requirement than the FSP gross income eligibility standard. It reduces the error of incorrectly predicting a FSP-ineligible household as FSP-eligible by predicting as ineligible households with higher income. Households with higher income are more likely to fail the net income or asset test.

Large errors occur when predicting FSP eligibility with only household size and income (see Table IV.1). The simple rule outlined above would misclassify the FSP-eligibility of 6.4 percent of all U.S. households. Over 70 percent of those errors result from incorrectly predicting FSP-ineligible households as FSP eligible. In a sample of households that are predicted FSP eligible using the simple rule, about one quarter would actually be ineligible. And of all FSP-eligible households, more than 11 percent would be predicted to be FSP ineligible.

B. HOUSEHOLD COMPOSITION

Information about whether the household contains an elderly or disabled person is potentially important because the FSP eligibility standards differ for these households. Elderly and disabled households are subject only to a net income rule and elderly households have a higher asset threshold. These households make up a sizeable proportion of all FSP-eligible households. Just under 30 percent of FSP-eligible households contain an elderly person, about 10 percent contain a disabled person but no elderly person, and the remaining 60 percent contain neither an elderly nor a disabled member.

Estimates of the errors predicting FSP eligibility with information about whether the household contains an elderly person (an "elderly" household) or a disabled person (a "disabled" household) are presented in Table IV.2. This table shows that it is much harder to predict the FSP eligibility of disabled households and even harder to predict the FSP eligibility of elderly households using only

TABLE IV.2

ERRORS IN PREDICTING FSP ELIGIBILITY USING HOUSEHOLD SIZE, INCOME, AND COMPOSITION

Gross Income Rule	Error 1: Percentage of Hsds Predicted Eligible When Actually Ineligible[a]	Error 2: Percentage of Hsds Predicted FSP Ineligible When Actually Eligible[a]	Error 1 + Error 2
Nonelderly Nondisabled Households			
<=120% of poverty	4.1	0.9	5.1
<=130% of poverty	**5.0**	**0.1**	**5.1**
<=140% of poverty	6.6	0.1	6.7
Nonelderly Disabled Households			
<=120% of poverty	2.7	5.6	8.4
<=130% of poverty	**4.1**	**3.5**	**7.6**
<=140% of poverty	6.5	2.1	8.5
Elderly Households			
<=110% of poverty	4.6	5.0	9.6
<=120% of poverty	**5.8**	**3.3**	**9.1**
<=130% of poverty	7.9	2.3	10.2
<=140% of poverty	10.2	1.5	11.7
All Households			
<=130% (nonelderly) <=120% (elderly)	5.2	1.1	6.3
Percentage of hsds predicted FSP eligible that are actually ineligible			25.9
Percentage of FSP-eligible hsds that are predicted ineligible			6.9

SOURCE: January 1994 SIPP

[a]Households are assumed to be FSP eligible if they are predicted to be eligible using the MATH SIPP model.

Hsds = Households

information on gross income. In particular, the probability of incorrectly predicting a FSP-eligible household as ineligible is much higher for an elderly or disabled household than it is for a nonelderly nondisabled household. Hence applying a gross income rule to predict FSP eligibility, will cause some households to be incorrectly classified as ineligible.

The best income rule to predict FSP eligibility differs between elderly and nonelderly households, but it does not vary between nonelderly households that contain a disabled person and nonelderly households that do not.[2] Hence, additional information about whether a household is disabled, without other information, does not buy any greater accuracy predicting FSP eligibility. If information is available on household size, income, and presence of an elderly person, the best way to predict FSP eligibility is:

- Predict that a nonelderly household is FSP eligible only if its income does not exceed 130 percent of poverty
- Predict that an elderly household is FSP eligible only if its income does not exceed 120 percent of poverty

The income cutoff is lower for elderly households because, on average, they have much higher assets and are more likely than nonelderly households to fail the FSP asset rule.[3] Households with higher income are more likely to fail the asset test. Intuitively, the stricter income cutoff can be thought of as performing the function of an asset test.

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[2]The sum of error 1 and error 2 is larger using a gross income cutoff of 120 percent of poverty than using a gross income of 130 percent of poverty, but by less than one-tenth of a percentage point.

[3]In January 1994, we estimate using January 1994 SIPP data that on average FSP-eligible nonelderly households had countable assets worth $286 while FSP-eligible elderly households had countable assets worth an average of $818.

We estimate that use of this rule would lead to an incorrect prediction of FSP eligibility for 6.3 percent of all households. The error of incorrectly predicting a FSP-ineligible household as FSP eligible predominates. About one quarter of all households predicted FSP eligible would actually be ineligible. Just more than 6 percent of all FSP-eligible households would be predicted ineligible.

C. RECEIPT OF PUBLIC ASSISTANCE

Asking whether household members receive public assistance is a simple, nonthreatening question. Under the FSP-eligibility standards, a household in which *all* members receive public assistance are eligible for FSP benefits, regardless of its income or assets. Of all FSP-eligible households, about 35 percent are eligible because they receive public assistance.

Estimates of the errors made when predicting FSP eligibility using information on household size and income, the presence of an elderly person, and whether everyone in the household receives public assistance are presented in Table IV.3. The best rule to predict FSP eligibility if information is available on receipt of public assistance, household size, household income, and the presence of elderly is:

- Predict that the household is FSP eligible if everyone in the household receives public assistance, regardless of their income
- Predict that a nonelderly household where at least some members do not receive public assistance is FSP eligible if its income does not exceed 130 percent of poverty
- Predict that an elderly household where at least some members do not receive public assistance is FSP eligible if its income does not exceed 120 percent of poverty

Using this rule would lead to a misclassification of FSP eligibility for more than 6 percent of all U.S. households, only slightly lower than when the information on receipt of public assistance was not available.

TABLE IV.3

ERRORS IN PREDICTING FSP ELIGIBILITY USING HOUSEHOLD SIZE, INCOME, AGE COMPOSITION, AND RECEIPT OF PUBLIC ASSISTANCE

Gross Income Rule (Percentage of Poverty)	Receipt of Public Assistance	Error 1: Percentage of Hsds Predicted Eligible When Actually Ineligible[a]	Error 2: Percentage of Hsds Predicted Ineligible When Actually Eligible[a]	Error 1 + Error 2
Nonelderly Households				
<=120%	By everyone in hsd	4.1	1.0	5.2
<=130%	**By everyone in hsd**	**5.0**	**0.1**	**5.1**
<=140%	By everyone in hsd	6.6	0.1	6.7
Elderly Households				
<=110%	By everyone in hsd	4.6	4.8	9.4
<=120%	**By everyone in hsd**	**5.9**	**3.2**	**9.1**
<=130%	By everyone in hsd	7.8	2.3	10.1
All Households				
<=130% (nonelderly) <=120% (elderly)	By everyone in hsd	5.2	1.0	6.3
Percentage of hsds predicted FSP eligible that are actually ineligible				25.7
Percentage of FSP-eligible hsds that are predicted ineligible				6.3

SOURCE: January 1994 SIPP

[a]Households are assumed to be FSP eligible if they are predicted to be eligible using the MATH SIPP model.

Hsds = Households

D. EARNINGS

Earnings affect FSP eligibility in two ways. First, earnings are a component of gross income and affect the likelihood that a household passes the gross income eligibility standard. Second, 20 percent of earnings can be deducted from gross income when calculating net income. A household with earnings is more likely to pass the FSP eligibility standards than a household with the same income but with no earnings.

Estimates of the errors in predicting FSP eligibility that we would make using information on whether the household has earnings, household size, household income, and the presence of elderly are presented in Table IV.4. The table shows that it is harder to predict FSP eligibility for households without earnings using information on gross income. This is because households without earnings are less likely than households with earnings to meet the net income standard.

The best rule to predict FSP eligibility varies between households with earnings and those without, but it does not vary between elderly and nonelderly households. The best rule is:

- Predict that a household with earnings is FSP eligible if its income does not exceed 130 percent of poverty
- Predict that a household without earnings is FSP eligible if its income does not exceed 120 percent of poverty

The income rule is stricter for households without earnings, since these households are most likely to not meet the net income rule for a given income level.

We estimate that this rule would lead to an incorrect prediction of FSP eligibility in 6.3 percent of all households. As before, the error of incorrectly predicting a FSP-ineligible household as FSP eligible predominates. About one quarter of all households predicted FSP eligible would actually be ineligible. More than 7 percent of all FSP-eligible households would be predicted ineligible.

TABLE IV.4

ERRORS IN PREDICTING FSP ELIGIBILITY USING
HOUSEHOLD SIZE, INCOME, AGE COMPOSITION, AND EARNINGS

Gross Income Rule	Error 1: Percentage of Hsds Predicted FSP Eligible When Actually Ineligible[a]	Error 2: Percentage of Hsds Predicted Ineligible When Actually Eligible[a]	Error 1 + Error 2
Nonelderly Households with Earnings			
<=120% of poverty	2.8	1.1	3.8
<=130% of poverty	**3.6**	**0.1**	**3.7**
<=140% of poverty	5.3	0.1	5.4
Nonelderly Households without Earnings			
<=110% of poverty	12.2	3.2	15.4
<=120% of poverty	**12.9**	**1.7**	**14.6**
<=130% of poverty	14.0	0.9	14.8
Elderly Households with Earnings			
<=120% of poverty	1.5	2.3	3.7
<=130% of poverty	**1.8**	**1.8**	**3.7**
<=140% of poverty	2.7	1.4	4.1
Elderly Households without Earnings			
<=110% of poverty	6.4	6.4	12.7
<=120% of poverty	**8.0**	**3.9**	**11.9**
<=130% of poverty	11.0	2.5	13.5
All Households			
<=130% (hsds with earnings) <=120% (hsds w/out earnings)	5.1	1.1	6.3
Percentage of hsds predicted FSP eligible that are actually ineligible			25.7
Percentage of FSP-eligible hsds that are predicted ineligible			7.2

SOURCE: January 1994 SIPP

[a]Households are assumed to be FSP eligible if they are predicted to be eligible using the MATH SIPP model.

Hsds = Households

E. EXPENSES

In addition to the standard and earnings deductions, households can deduct medical expenses for elderly or disabled persons (above $35 per person), dependent-care expenses, and shelter costs. Table IV.5 presents our estimates of the errors that would be made using information that households have medical expenses greater than $35, have dependent-care expenses, or have shelter expenses that exceed the median shelter costs for elderly or nonelderly FSP-eligible households (in addition to household income, size, and age composition).[4] We do not present estimates of the prediction errors using information for medical expenses for nonelderly households because only a small proportion of these households can take the deductions. For the same reason, we do not present estimates of the prediction errors using information on dependent-care expenses for elderly households.

We find that the best rule for predicting FSP eligibility does not vary between households that are likely to take these deductions and those who cannot. Hence, information about whether households have these expenses or not, would not be useful.

F. NET INCOME

All households are subject to the rule that income net of deductions must be less than 100 percent of poverty. Table IV.6 present estimates of prediction errors that would be made if we had information not only on income but also on the value of all deductions. It is important to note that to calculate net income, information is needed on the amount of income, earnings, and expenses, and not just whether the income or expenses exceed a specified amount.

The rule that minimizes prediction errors when net income is known is:

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[4]The shelter expense deduction is calculated as the amount shelter expenses exceed percent of a household's countable income after all other potential deductions are subtracted from gross income. We assume that if shelter expenses are greater than the median expense, the household is more likely to take a shelter expense deduction.

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TABLE IV.5

ERRORS IN PREDICTING FSP ELIGIBILITY USING HOUSEHOLD SIZE, INCOME, AGE COMPOSITION, AND CERTAIN EXPENSES

Gross Income Rule	Error 1: Percentage of Hsds Predicted FSP Eligible When Actually Ineligible[a]	Error 2: Percentage of Hsds Predicted Ineligible When Actually Eligible[a]	Error 1 + Error 2
Elderly Households with Medical Expenses >=$35			
<=110% of poverty	4.3	5.6	9.9
<=120% of poverty	**5.6**	**4.2**	**9.8**
<=130% of poverty	7.5	3.0	10.5
Elderly Households with Medical Expenses <$35			
<=110% of poverty	5.0	4.5	9.4
<=120% of poverty	**6.1**	**2.4**	**8.4**
<=130% of poverty	8.3	1.5	9.9

TABLE IV.5 *(continued)*

Gross Income Rule	Error 1: Percentage of Hsds Predicted FSP Eligible When Actually Ineligible[a]	Error 2: Percentage of Hsds Predicted Ineligible When Actually Eligible[a]	Error 1 + Error 2
Nonelderly Households with Shelter Expenses <$415[b]			
<=120% of poverty	6.1	1.5	7.5
<=130% of poverty	**7.3**	**1.5**	**7.4**
<=140% of poverty	9.7	0.1	9.8
Elderly Households with Shelter Expenses >=$299[c]			
<=110% of poverty	3.4	6.7	10.1
<=120% of poverty	**4.3**	**5.1**	**9.3**
<=130% of poverty	6.0	3.9	9.9
Nonelderly Households with Shelter Expenses <$299[c]			
<=110% of poverty	5.9	3.5	9.4
<=120% of poverty	**7.5**	**1.7**	**9.2**
<=130% of poverty	10.0	0.7	10.7

SOURCE: January 1994 SIPP

[a]Households are assumed to be FSP eligible if they are predicted to be eligible using the MATH SIPP model.
[b]The median shelter expenses of nonelderly FSP-eligible households in the sample is $415.
[c]The median shelter expenses of elderly FSP-eligible households in the sample is $299.

Hsds = Households

TABLE IV.6

ERRORS IN PREDICTING FSP ELIGIBILITY USING
HOUSEHOLD SIZE, INCOME, AGE COMPOSITION, AND NET INCOME

Gross Income Rule (Percentage of Poverty)	Net Income Rule (Percentage of Poverty)	Error 1: Percentage of Hsds Predicted FSP Eligible When Actually Ineligible[a]	Error 2: Percentage of Hsds Predicted Ineligible When Actually Eligible[a]	Error 1 + Error 2
Nonelderly Households				
<=120%	<=90%	3.4	1.1	4.5
<=130%	<=90%	3.8	0.5	4.3
<=140%	<=90%	4.6	0.4	5.0
<=120%	<=100%	3.4	1.0	4.4
<=130%	**<=100%**	**4.0**	**0.2**	**4.2**
<=140%	<=100%	5.1	0.1	5.2
<=120%	<=110%	4.1	1.1	5.2
<=130%	<=110%	4.9	0.2	5.1
<=140%	<=110%	6.5	0.1	6.6
Elderly Households				
<=110%	<=90%	4.6	5.1	9.6
<=120%	<=90%	5.3	4.0	9.3
<=130%	<=90%	6.1	3.2	9.3
<=110%	<=100%	4.6	5.0	9.6
<=120%	**<=100%**	**5.7**	**3.4**	**9.1**
<=130%	<=100%	6.8	2.3	9.2
<=110%	<=110%	4.6	5.0	9.6
<=120%	<=110%	5.8	3.3	9.1
<=130%	<=110%	7.8	2.3	10.1
All Households				
<=130% (nonelderly) <=120% (elderly)	<=100%	5.0	1.1	6.2
Percentage of hsds predicted FSP eligible that are actually ineligible				25.3
Percentage of FSP-eligible hsds that are predicted ineligible				7.0

SOURCE: January 1994 SIPP

[a]Households are assumed to be FSP eligible if they are predicted to be eligible using the MATH SIPP model.

Hsds = Households

- Predict that a nonelderly household is FSP eligible if its gross income does not exceed 130 percent of poverty and its net income does not exceed 100 percent of poverty

- Predict that an elderly household is FSP eligible if its gross income does not exceed 120 percent of poverty and its net income does not exceed 100 percent of poverty

For nonelderly households, our income cutoffs are the same as the FSP eligibility standards. However, for elderly households, fewer prediction errors are made using a lower gross income cutoff. This screens our households that are more likely to have assets that exceed the FSP asset standard.

G. VEHICLES

The FSP does not have an eligibility standard based on vehicle assets alone. However, most vehicles are viewed as assets and together with financial assets are subject to the asset eligibility standard. The exceptions are vehicles used as a home, to produce income, or to transport disabled persons. Countable assets in a household's first vehicle and vehicles used to commute to work are calculated as the fair market value of the vehicle in excess of a threshold of $4,650. Countable assets in other vehicles are calculated as the higher of the fair market value in excess of $4,650 and the equity in the vehicle. So four pieces of information about vehicles are required to calculate the value of countable vehicle assets:

1. The fair market value of each vehicle. Many people would not be able to answer a question about the market value of their vehicles. However, most would be able to answer a question about the age, make, and model of their vehicles. With this information, a researcher could mimic the work of a FSP caseworker and estimate the value of the vehicles by looking them up in the blue book.

2. The equity value of each vehicle. The best way to collect this information is to ask how much the household owes on the vehicle and subtract this from the market value of the vehicle.

3. Whether the vehicle is used as a home, to produce income, or to transport disabled persons.

4. Whether the vehicles are used to commute to work or training programs.

Hence, to collect all this information requires at least four questions. These questions are, however, simple and nonthreatening. (The first three of these pieces of information are currently collected by SIPP.) And only two questions need be asked of households with only one vehicle.

For a household to be FSP eligible, total counted assets of nonelderly households must not exceed $2,000 and total counted assets of elderly households must not exceed $3,000. In January 1994, average countable vehicle assets (assets in excess of $4,500) of nonelderly households were $142 and average countable vehicle assets of elderly households were $115. On average, counted vehicle assets comprise about 21 percent of all assets held by FSP-eligible households.

1. Age of Vehicles

While information on the age of a household vehicles cannot be used to estimate the value of the household's vehicle assets, it can be used to predict which households are likely to be FSP ineligible. Households with new vehicles are much more likely to have large amounts of vehicle assets than households without new vehicles.

Estimates of the prediction errors that would be made using information on whether the household owns any vehicles that are no older than a specified age, household size, household income, and the presence of an elderly person are presented in Table IV.7. Using this information, we find that the best rule to predict FSP eligibility is:

- Predict that a nonelderly household is FSP eligible if its income does not exceed 130 percent of poverty and it owns no vehicle newer than 6 years old

TABLE IV.7

ERRORS IN PREDICTING FSP ELIGIBILITY USING
HOUSEHOLD SIZE, INCOME, AGE COMPOSITION, AND AGE OF VEHICLES

Gross Income Rule (Percentage of Poverty)	Age of Vehicle (Hsd Does not Own a Vehicle Younger Than This)	Error 1: Percentage of Hsds Predicted Eligible When Actually Ineligible[a]	Error 2: Percentage of Hsds Predicted Ineligible When Actually Eligible[a]	Error 1 + Error 2
Nonelderly Households				
<=120%	5 years	2.5	1.3	3.8
<=130%	5 years	3.0	0.5	3.5
<=140%	5 years	4.3	0.4	4.7
<=120%	6 years	2.1	1.7	3.8
<=130%	**6 years**	**2.5**	**0.1**	**3.3**
<=140%	6 years	3.7	0.7	4.4
<=120%	7 years	1.8	2.1	3.9
<=130%	7 years	2.1	1.3	3.4
<=140%	7 years	3.2	1.2	4.4
Elderly Households				
<=110%	6 years	3.4	5.3	8.7
<=120%	6 years	4.3	3.6	7.9
<=130%	6 years	5.8	2.7	8.5
<=110%	7 years	3.1	5.5	8.7
<=120%	**7 years**	**3.9**	**3.9**	**7.8**
<=130%	7 years	5.4	3.0	8.3
<=110%	8 years	2.9	5.8	8.7
<=120%	8 years	3.6	4.3	7.9
<=130%	8 years	4.9	3.4	8.4
All Households				
<=130% (nonelderly) <=120% (elderly)	6 years (nonelderly) 7 years (elderly)	2.9	1.7	4.6
Percentage of hsds predicted FSP eligible that are actually ineligible				17.0
Percentage of FSP-eligible hsds that are predicted ineligible				10.7

SOURCE: January 1994 SIPP

[a]Households are assumed to be FSP eligible if they are predicted to be eligible using the MATH SIPP model.

Hsds = Households

TABLE IV.8

ERRORS IN PREDICTING FSP ELIGIBILITY USING HOUSEHOLD SIZE, INCOME, AGE COMPOSITION, AND VEHICLE ASSETS

Gross Income Rule (Percentage of Poverty)	Value of Vehicular Assets - $4,500	Error 1: Percentage of Hsds Predicted Eligible When Actually Ineligible[a]	Error 2: Percentage of Hsds Predicted Ineligible When Actually Eligible[a]	Error 1 + Error 2
Nonelderly Households				
<=120%	1,000	1.1	2.3	3.4
<=130%	1,000	1.3	1.5	2.9
<=140%	1,000	2.3	1.5	3.8
<=120%	1,500	1.4	1.4	2.8
<=130%	1,500	1.7	0.5	2.2
<=140%	1,500	2.8	0.4	3.2
<=120%	2,000	1.5	1.2	2.7
<=130%	**2,000**	**1.8**	**2.7**	**2.1**
<=140%	2,000	3.0	2.0	3.2
Elderly Households				
<=110%	500	2.8	5.6	8.4
<=120%	500	3.6	4.0	7.6
<=130%	500	4.9	3.1	8.0
<=110%	1,000	2.8	5.6	8.4
<=120%	**1,000**	**3.6**	**4.0**	**7.6**
<=130%	1,000	4.9	3.0	8.0
<=110%	1,500	3.1	5.3	8.5
<=120%	1,500	4.0	3.7	7.7
<=130%	1,500	5.4	2.7	8.1

TABLE IV.8 *(continued)*

Gross Income Rule (Percentage of Poverty)	Value of Vehicular Assets - $4,500	Error 1: Percentage of Hsds Predicted Eligible When Actually Ineligible[a]	Error 2: Percentage of Hsds Predicted Ineligible When Actually Eligible[a]	Error 1 + Error 2
All Households				
<=130% (nonelderly) <=120% (elderly)	<= $2,000 (nonelderly) <= $1,000 (elderly)	2.4	1.3	3.7
Percentage of hsds predicted FSP eligible that are actually eligible				14.4
Percentage of FSP-eligible hsds that are predicted ineligible				8.1

SOURCE: January 1994 SIPP

[a]Households are assumed to be FSP eligible if they are predicted to be eligible using the MATH SIPP model.

Hsds = Households

- Predict an elderly household is FSP eligible if its income does not exceed 120 percent of poverty and its counted vehicle assets do not exceed $1,000

Even though the FSP asset standard is higher for elderly households than nonelderly households, when only vehicle assets are known, the prediction errors are minimized when FSP eligibility is simulated with a lower asset limit for elderly households. Our vehicle asset rule is still stricter for elderly households even when information on the asset value of the vehicle is available rather than just the age.

We estimate that this rule would lead to an incorrect prediction of FSP eligibility in 3.7 percent of all households. About 14 percent of all households predicted FSP eligible would actually be ineligible. And about 8 percent of all FSP-eligible households would be predicted ineligible. The difference in the two types of errors is less than it would have been if no information on vehicles was available.

H. FINANCIAL ASSETS

Financial assets predominate the assets of the majority of FSP-eligible households. Estimates of the errors that would be made using information on financial assets, household size, household income, and whether the household is elderly are presented in Table IV.9. The best rule for predicting FSP eligibility using this information is:

- Predict that a nonelderly household is FSP eligible if its income does not exceed 130 percent of poverty and its financial assets do not exceed $2,000
- Predict that an elderly household is FSP eligible if its income does not exceed 130 percent of poverty and its financial assets do not exceed $3,000

The best income rule for elderly households is 130 percent of poverty when information on financial assets are available, compared with 120 percent when information on financial assets is not

TABLE IV.9

ERRORS IN PREDICTING FSP ELIGIBILITY USING HOUSEHOLD SIZE, INCOME, AGE COMPOSITION, AND FINANCIAL ASSETS

Gross Income Rule (Percentage of Poverty)	Value of Financial Assets	Error 1: Percentage of Hsds Predicted Eligible When Actually Ineligible[a]	Error 2: Percentage of Hsds Predicted Ineligible When Actually Eligible[a]	Error 1 + Error 2
Nonelderly Households				
<=120%	1,000	1.5	1.5	3.0
<=130%	1,000	1.9	0.6	2.5
<=140%	1,000	3.1	0.5	3.7
<=120%	1,500	1.7	1.3	3.0
<=130%	1,500	2.1	0.4	2.5
<=140%	1,500	3.4	0.3	3.7
<=120%	2,000	1.8	1.1	2.9
<=130%	**2,000**	**2.2**	**0.2**	**2.5**
<=140%	2,000	3.6	0.1	3.7
Elderly Households				
<=120%	2,000	0.8	3.8	4.6
<=130%	2,000	1.4	2.8	4.2
<=140%	2,000	2.2	2.1	4.3
<=120%	2,500	0.9	3.5	4.5
<=130%	2,500	1.5	2.5	4.0
<=140%	2,500	2.3	1.8	4.1
<=120%	3,000	1.0	3.3	4.3
<=130%	**3,000**	**1.6**	**2.3**	**3.9**
<=140%	3,000	2.5	1.6	4 .0

TABLE IV.9 *(continued)*

Gross Income Rule (Percentage of Poverty)	Value of Financial Assets	Error 1: Percentage of Hsds Predicted Eligible When Actually Ineligible[a]	Error 2: Percentage of Hsds Predicted Ineligible When Actually Eligible[a]	Error 1 + Error 2
		All Households		
<=130%	<= $2,000 (nonelderly) <= $3,000 (elderly)	2.0	0.8	2.9
Percentage of hsds predicted FSP eligible that are actually ineligible				11.9
Percentage of FSP-eligible hsds that are predicted ineligible				5.2

SOURCE: January 1994 SIPP

[a]Households are assumed to be FSP eligible if they are predicted to be eligible using the MATH SIPP model.

Hsds = Households

available. Intuitively, this is because without data on financial assets, our income threshold was set low enough to screen out households with high assets. When data on financial assets are available, the income threshold does not need to perform this function.

We estimate that this rule would lead to an incorrect prediction of FSP eligibility in only 2.9 percent of all households. About 12 percent of all households predicted FSP eligible would actually be ineligible. And just more than 5 percent of all FSP-eligible households would be predicted ineligible.

I. AGE OF VEHICLES AND FINANCIAL ASSETS

Estimates of the errors that would be made using information on financial assets and age of vehicles (but not the value of the vehicles), as well as household size, household income, and whether the household is elderly are presented in Table IV.10. The best rule for predicting FSP eligibility using this information is:

- Predict a nonelderly household as FSP eligible if its income does not exceed 130 percent of poverty, its financial assets do not exceed $2,000, and it owns no vehicle newer than five years old.
- Predict an elderly household as FSP eligible if its income does not exceed 130 percent of poverty, its financial assets do not exceed $3,000, and it owns no vehicle newer than five years old.

Under this rule, the assets limits for both elderly and nonelderly households and the income limit for nonelderly households are set at the FSP-eligibility standards. The best vehicle age limit is lower than it is if no data are available on financial assets. Intuitively, this is because the vehicle cut off need not screen out households with high financial assets.

TABLE IV.10

ERRORS IN PREDICTING FSP ELIGIBILITY USING HOUSEHOLD SIZE, INCOME, AGE, COMPOSITION, AGE OF VEHICLES, AND FINANCIAL ASSETS

Gross Income Rule (Percentage of Poverty)	Age of Vehicle (Hsd Does not Own a Vehicle Younger Than This)	Value of Financial Assets	Error 1: Percentage of Hsds Predicted Eligible When Actually Ineligible[a]	Error 2: Percentage of Hsds Predicted Ineligible When Actually Eligible[a]	Error 1 + Error 2
Nonelderly Households					
<=120%	4	1,500	1.1	1.4	2.5
<=130%	4	1,500	1.3	0.5	1.9
<=140%	4	1,500	2.5	0.5	2.9
<=120%	5	1,500	0.9	1.5	2.4
<=130%	5	1,500	1.1	0.6	1.7
<=140%	5	1,500	2.2	0.6	2.7
<=120%	6	1,500	0.7	1.8	2.5
<=130%	6	1,500	0.9	1.0	1.9
<=140%	6	1,500	1.8	0.9	2.8
<=120%	4	2,000	1.1	1.3	2.4
<=130%	4	2,000	1.4	0.3	1.8
<=140%	4	2,000	2.6	0.3	2.8
<=120%	5	2,000	0.9	1.4	2.3
<=130%	**5**	**2,000**	**1.2**	**0.5**	**1.6**
<=140%	5	2.000	2.3	0.4	2.6
<=120%	6	2,000	0.7	1.7	2.4
<=130%	6	2,000	0.9	0.8	1.8
<=140%	6	2,000	1.9	0.7	2.7

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Table IV.10 *(continued)*

Gross Income Rule (Percentage of Poverty)	Age of Vehicle (Hsd Does not Own a Vehicle Younger Than This)	Value of Financial Assets	Error 1: Percentage of Hsds Predicted Eligible When Actually Ineligible[a]	Error 2: Percentage of Hsds Predicted Ineligible When Actually Eligible[a]	Error 1 + Error 2
Elderly Households					
<=120%	4	2,500	0.5	3.6	4.1
<=130%	4	2,500	0.9	2.6	3.4
<=140%	4	2,500	1.6	1.9	3.5
<=120%	5	2,500	0.4	3.6	4.0
<=130%	5	2,500	0.7	2.6	3.4
<=140%	5	2,500	1.5	1.9	3.4
<=120%	6	2,500	0.6	2.9	3.5
<=130%	6	2,500	1.3	2.2	3.5
<=140%	6	2,500	2.0	1.8	3.8
<=120%	4	3,000	0.5	3.4	3.9
<=130%	4	3,000	1.0	2.4	3.3
<=140%	4	3,000	1.8	1.6	3.4
<=120%	5	3,000	0.4	3.4	3.9
<=130%	**5**	**3,000**	**0.8**	**2.4**	**3.3**
<=140%	5	3,000	1.6	1.7	3.3
<=120%	6	3,000	0.3	3.6	4.0
<=130%	6	3,000	0.7	2.7	3.3
<=140%	6	3,000	1.4	2.0	3.4
4H Households					

We estimate that these rules would lead to an incorrect prediction of FSP eligbility in 2.1 percent of all households. About 7 percent of all households predicted FSP eligible would actually be ineligible and about 6 percent of all FSP-eligible households would be predicted ineligible.

J. ALL ASSETS

When data on all countable assets, including financial and vehicles, are available, the asset FSP-eligibility standard can be applied directly. Table IV.11 presents estimates of the errors that would result from using information on the value of all assets, household size, household income, and whether the household contains an elderly person.

The best rule for predicting FSP eligibility using this information is:

- Predict a nonelderly household as FSP eligible if its income does not exceed 130 percent of poverty and its assets do not exceed $2,000
- Predict an elderly household is FSP eligible if its income does not exceed 140 percent of poverty and its assets do not exceed $3,000

Under this rule, the asset limits for both elderly and nonelderly households and the income limits for nonelderly households are set at the FSP-eligibility standards. The best income rule to use with elderly households when asset information is known is 140 percent of poverty, which is higher than it is when information on assets was not available. This is because the income screen need not need to screen out households with high assets.

We estimate that this rule would lead to an incorrect prediction of FSP eligibility in only 1.1 percent of all households. Less than 3 percent of all households predicted FSP eligible would actually be ineligible. And only about 4 percent of all FSP-eligible households would be predicted ineligible. With this rule, the error of incorrectly predicting that a FSP-ineligible household is eligible is lower than the error of predicting that a FSP-eligible household is ineligible.

TABLE IV.11

ERRORS IN PREDICTING FSP ELIGIBILITY USING HOUSEHOLD SIZE, INCOME, AGE, COMPOSITION, AND ALL ASSETS

Gross Income Rule (Percentage of Poverty)	Value of All Assets	Error 1: Percentage of Hsds Predicted Eligible When Actually Ineligible[a]	Error 2: Percentage of Hsds Predicted Ineligible When Actually Eligible[a]	Error 1 + Error 2
Nonelderly Households				
<=120%	1,000	0.02	2.7	2.7
<=130%	1,000	0.1	2.0	2.1
<=140%	1,000	0.9	1.9	2.8
<=120%	1,500	0.02	1.7	1.8
<=130%	1,500	0.1	0.9	1.0
<=140%	1,500	1.0	0.8	1.8
<=120%	2,000	0.03	1.2	1.2
<=130%	**2,000**	**0.1**	**0.3**	**0.4**
<=140%	2,000	1.1	0.2	1.3
Elderly Households				
<=130%	2,500	0.1	3.7	3.7
<=140%	2,500	0.3	2.7	3.0
<=150%	2,500	1.7	1.5	3.2
<=130%	3,000	0.4	2.3	2.7
<=140%	**3,000**	**1.1**	**1.6**	**2.7**
<=150%	3,000	1.8	1.1	2.9
All Households				
<=130% (nonelderly) <=120% (elderly)	<= $2,000 (nonelderly) <= $3,000 (elderly)	0.4	0.7	1.1
Percentage of hsds predicted FSP eligible that are actually ineligible				2.6
Percentage of FSP-eligible hsds that are predicted ineligible				4.1

SOURCE: January 1994 SIPP

[a]Households are assumed to be FSP eligible if they are predicted to be eligible using the MATH SIPP model.

Hsds = Households

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V. SUMMARY AND RECOMMENDATIONS

This chapter summarizes our findings and makes recommendations about the data necessary to make good predictions of a household's FSP eligibility. We begin in Section A by summarizing our findings. Section B discusses our general recommendations on issues that should be considered when designing survey questionnaires to collect information needed to predict FSP eligibility. Section C discusses the more specific issues of the ability of the data currently collected by the CSFII to make good predictions of FSP eligibility and what information could be collected to improve those predictions.

A. SUMMARY OF FINDINGS

In the previous chapter, we presented estimates of the errors in predicting FSP eligibility that would be made using different sets of information and different simulated eligibility rules. Table V.1 summarizes those findings. Each row of the table presents the estimates of the errors in predicting FSP eligibility using the simulated eligibility rules that minimizes the proportion of all households for which a prediction error is made. The first row, which is shaded, presents the errors if only household size and income is known. The second row presents the errors that would be made if the researcher knew whether the household contains an elderly person *as well as* the household size and income. The remaining rows present the errors that would be made if the researcher knew a piece of information about the household in addition to the household size, household income, and whether the household was elderly.

An important finding of this report is that without information on assets large errors in predicting FSP eligibility will be made . With information on only household size and income, an incorrect prediction of FSP eligibility would be made for 6.4 percent of all households. If a sample of FSP-

TABLE V.1

SUMMARY OF ERRORS MADE USING THE BEST PREDICTION RULES WITH DIFFERENT TYPES OF INFORMATION

Information Available in Addition to Household Size, Income, and Age Composition	Percentage of all Hsds with Errors in FSP Eligibility Prediction	Percentage of All Hsds Predicted Eligible That Are Actually Ineligible	Percentage of All FSP-Eligible Hsds That Are Predicted Ineligible
Just Household Size and Income	**6.4**	**24.4**	**11.3**
None (just household size, income, and age composition)	6.3	25.9	6.9
Whether hsd has a disabled member	6.3	25.9	6.9
Whether everyone in hsd receives public assistance	6.3	25.7	6.3
Whether hsd has earnings	6.3	25.7	7.2
Whether hsd has medical expenses for elderly or disabled members >=$35, dependent-care expenses, or high shelter costs	6.3	25.9	6.9
Amount of net income	6.2	25.3	7.0
Age of vehicles	4.6	17.0	10.7
Amount of vehicle assets or age, make, and year of all vehicles owned by hsd	3.7	14.4	8.1
Amount of financial assets	2.9	11.9	5.2
Amount of financial assets and age of vehicles	2.1	6.9	6.4
Amount of all assets	1.1	2.6	4.1

SOURCE: January 1994 SIPP

NOTE: These estimates were presented in Tables IV.1 through IV.10.

Hsds = households

eligible households was created on the basis of this information alone, nearly one-quarter of the households would actually be FSP ineligible. More than 11 percent of FSP-eligible households would be incorrectly misclassified as ineligible. Researchers should be aware of these large errors when interpreting findings based on a sample created with only this information.

The errors in predicting FSP eligibility can be decreased somewhat by using additional information about the household that is often already collected by a survey or could be collected by adding a few simple nonthreatening questions to the survey. For example, knowing whether the household is elderly can reduce the error in predicting FSP eligibility slightly. Additional information that reduces errors slightly includes receipt of public assistance and whether the household has income from earnings. Knowing whether the household has a disabled member or knowing whether the household has medical expenses, shelter costs, or dependent-care costs in addition to household size and income and whether the household is elderly does not reduce the prediction errors.

Prediction errors do not fall much if information is available on net income. Even with information on household size, gross income, net income, and whether the household is elderly, errors in predicting FSP eligibility are still made for more than 6 percent of all households. To calculate net income requires information on the amount of income (rather than whether it exceeds a threshold), the amount of earnings, and the amount of three types of expenses. Our findings suggest that little is gained from collecting this information.

To reduce prediction errors significantly, information is needed on household assets. Just knowing the age of the vehicles owned by the household reduces the percentage of all households in which an error is made in predicting FSP eligibility from 6.3 percent to 4.6 percent. A further reduction in prediction errors is made if the amount of the household's vehicle assets is known. Prediction errors fall even more if information about the household's financial assets is known. The

number of prediction errors are halved when information is available on financial assets. With information on household size and income, whether the household is elderly, and financial assets, fewer than 12 percent of all households predicted FSP eligible would actually be ineligible and about 5 percent of all FSP-eligible households would be incorrectly predicted as FSP ineligible. These errors can be reduced somewhat by also having information on the age of vehicles. As expected, the most dramatic decrease in errors is made when information on all assets is available.

B. GENERAL RECOMMENDATIONS

In thinking about which questions to include in a survey to collect information to predict FSP eligibility five issues should be considered:

1. ***How much the errors in predicting FSP eligibility matters to the research.*** Depending on the research question, errors may be more or less important. If errors are less important, then the benefit from collecting more information may not be worth the associated cost and burden. Whether the error in incorrectly predicting FSP eligibility or the error in incorrectly predicting FSP ineligibility is more important will also influence the selection of questions.

2. ***The costs and burden to the respondent of collecting the information.*** Some information needed to predict FSP eligibility, such as whether the household is elderly, can be collected with one simple nonthreatening question. Other information, such as the value of a household's assets, can only be collected with several difficult and often sensitive questions. These can add significantly to the length of the survey, increase the burden to the respondent, and possibly lead to a greater nonresponse.

3. ***The population of interest.*** Table V.1 presents estimates of the errors made in predicting FSP eligibility in a sample of all households. The errors made in predicting FSP eligibility will differ among subgroups of the population. For example, errors predicting FSP eligibility using just income information are much higher for elderly households, disabled households, and households with no earnings.

4. ***The accuracy of the information collected.*** All information collected by surveys will be subject to reporting errors. However, some information will be more susceptible to reporting errors than others. Unfortunately, income and asset information are most likely to be reported with error. Information on whether a household is elderly or the types of vehicles owned by the household are less likely to be reported with error.

5. ***Whether using a simple rule to predict FSP eligibility may potentially bias the results of the research.*** Without all the information needed to predict FSP eligibility, we need to proxy the eligibility rule. Imperfect proxies can lead to a bias if the outcome of interest is correlated with the proxy. For example, if a researcher was interested in comparing the age of vehicles owned by FSP-eligible households with those owned by FSP ineligible households, using the age of vehicles to approximate the FSP eligibility standards would lead to an upward bias in the estimates of the differences in the age of vehicles owned by FSP-eligible and FSP-ineligible households. This issue would be much less of a concern if the outcome of interest was the food security of the household.

The minimal information needed to make a credible prediction of FSP eligibility is household size and income. It is not necessary to know the amount of income, just whether the household's income is less than a specific amount. This requires just two questions. However, the question about income will be sensitive and may be quite difficult for the respondent to answer. This information alone leads to large errors in predicting FSP eligibility. The errors can be reduced slightly by collecting information about whether the household is elderly, information that is collected by most surveys for other reasons. Prediction errors can also be reduced slightly by collecting information about whether everyone in the household receives public assistance.

To make a fairly accurate prediction of FSP eligibility, information about assets is necessary. A very good prediction of FSP eligibility can be made if information on a household's total assets is known. However, this requires questions about the value of vehicles and financial assets. Questions about financial assets are long, complicated, and sensitive.

If cost and burden issues are important, a good compromise may be to collect information on the age, make, and model of all vehicles owned by a household. Question about vehicles are straightforward. They are also not sensitive--everyone can see at least the make and model of the vehicles a person drives. With this information, the researcher can look up the value of the household's vehicles in the blue book and make a fairly good prediction of FSP eligibility. Only 3.7 percent of all household would be misclassified according to their FSP eligibility status, about 14

percent of households predicted FSP eligible would actually be ineligible, and 8 percent of all FSP-eligible households would be predicted as ineligible.

Better predictions of FSP eligibility can be made with information on financial assets than information on vehicle assets. The error in predicting FSP eligibility is only 2.9 percent when the value of financial assets is known, compared with 3.7 percent when vehicle assets are known. However, the cost and burden of asking questions about financial assets is so much larger than that of asking about vehicle assets, and information on financial assets is more likely to be misreported. Therefore, if it is only possible to collect information on one type of assets, it would usually be better to collect information on vehicles.

If a survey is to be administered only to a sample of FSP-eligible households, the FSP-eligible households are usually identified in a screening interview administered before the main questionnaire. In this case, an interviewer often needs to be make a decision about whether a household is FSP-eligible quickly. If the interview is being conducted with Computer Assisted Telephone Interviewing (CATI), the computer can assimilate all the information quickly. However, it is not yet possible for interviewers using CATI to access information quickly about the value of a vehicle given its age, make, and model.[1] An alternative would be to collect information on just the age of the vehicles and use a simple rule based on that information. As we see from Table V.1, the errors are larger when the value of the vehicles is unknown but they are still less than when no information on the household's assets is used.

Even better predictions can be made using information on whether the value of financial assets exceeds a threshold in addition to the age of the household's vehicles. With this information,

[1]Since most people do not know the fair market value of their vehicles, asking directly in a survey about the value of vehicles would not yield accurate information.

predictions of FSP eligibility would only be incorrect for about 2.1 percent of all households. If the prediction of FSP eligibility needs to be made during the interview (if it is to be used as a screening criteria, for example), the prediction errors cannot be reduced much further. However, if the prediction of FSP eligibility does not need to be made during the interview, prediction errors can be reduced by nearly half, to 1.1 percent, by also collecting information on the make, year, and model of the household's vehicles.

C. RECOMMENDATIONS ABOUT QUESTIONS TO INCLUDE IN THE CSFII

The CSFII currently collects the following information that could be used to predict FSP eligibility:[2]

- Total household income[3]
- Household size
- Age of household members
- Household earnings
- Amount of household financial assets in categories of $1,000[4] for households with financial assets of less than $5,000

With this information, the rule that minimizes the total number of prediction errors is to:

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[2]It also collects information about whether the household receives public assistance. Since it does not ask whether everyone in the household receives public assistance, this information is not useful in predicting FSP eligibility.

[3]Household is defined as all persons living together. This definition differs from that used by the FSP.

[4]Except for the first and second categories, which are less than $500 and $501 to $1,000.

- Predict that nonelderly households are FSP-eligible if their income does not exceed 130 percent of poverty and their financial assets do not exceed $2,000
- Predict that elderly households with earnings are FSP-eligible if their income does not exceed 140 percent of poverty and their financial assets do not exceed $3,000
- Predict that elderly households without earnings are FSP-eligible if their income does not exceed 130 percent of poverty and their financial assets do not exceed $3,000

Using this rule, we can make a fairly good prediction of FSP eligibility. Errors in predicting FSP eligibility would be made for only 3 percent of all households, about 12 percent of all households predicted FSP eligible would be actually ineligible, and about 5 percent of all FSP-eligible households would be predicted ineligible.

The errors that would be made predicting FSP eligibility with the information currently collected by the CSFII are presented in Table V.2. This table also presents the errors that would be made predicting FSP eligibility under three alternative scenarios:

1. An additional question is included in the CSFII that collects information about vehicles
2. The questions about financial assets are removed from the CSFII
3. The question about financial assets are replaced with simpler questions about vehicles

The best way to reduce further the error in predicting FSP eligibility using data from the CSFII would be to collect information on vehicles. This could be collected by two or three simple, nonthreatening questions. With information about both financial and vehicle assets, the errors predicting FSP eligibility would be quite small. Errors in predicting FSP eligibility would be made in only about 1 percent of all households, only about 1.4 percent of all households predicted FSP eligible would actually be FSP ineligible, and only 5 percent of all FSP-eligible households would be predicted ineligible.

TABLE V.2

SUMMARY OF ERRORS MADE USING INFORMATION COLLECTED
BY THE CSFII CURRENTLY AND UNDER ALTERNATIVE SCENARIOS

Scenario	Percentage of all Hsds with Errors in FSP Eligibility Prediction	Percentage of All Hsds Predicted Eligible That Are Actually Ineligible	Percentage of All FSP-Eligible Hsds That Are Predicted Ineligible
No change is made to the CSFII	2.9	12.0	4.9
Additional questions about vehicles are added to the CSFII	1.1	1.4	5.2
The questions about financial assets are removed from the CSFII	6.3	25.7	7.2
The questions about financial assets are replaced with questions about vehicles	3.7	14.0	8.1

SOURCE: January 1994 SIPP

NOTE: These estimates were presented in Tables IV.1 through IV.10.

Hsds = households

If cost and burden considerations mean that the question about financial assets will be dropped from the survey and not replaced, the errors predicting FSP eligibility will be much larger. Errors predicting FSP eligibility would be made for 6.3 percent of all households, about 26 percent of all households predicted FSP eligible would be actually ineligible, and about 7 percent of all FSP-eligible households would be predicted ineligible.

The cost and burden of the CSFII could be reduced by replacing the question about financial assets with one or two about vehicles. Although this would increase the errors predicting FSP eligibility, the errors would still be a lot lower than they would be if no asset information was collected.

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APPENDIX A

QUESTIONS THAT COLLECT INFORMATION NEEDED TO PREDICT FSP ELIGIBILITY

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This appendix lists some questions from surveys (such as SIPP, the Reaching the Working Poor and Poor Elderly Survey, and the National Food Stamp Program Survey) that collect information needed to predict FSP eligibility. They illustrate the types of questions that may be added to surveys to collect information about FSP eligibility. It is important to note that these questions are designed to be short and as simple as possible. More accurate information can be obtained by asking more questions. For example, one question we list below asks the respondent whether all their income sources together are less than a specific amount. The SIPP asks separately about over 30 different sources of income and so obtains a more accurate measure of income.

Household Size

How many people live in your household? By household I mean yourself and the people who live with you and share food with you.

Household Income

During [fill MONTH], was (your/your household's) income less than [fill AMOUNT] before taxes and other deductions?

Receipt of Public Assistance

Did (you/everyone in your household) receive [fill NAME OF STATE WELFARE PROGRAM], AFDC, Supplemental Security Income (SSI), or General Assistance during [fill MONTH]?

Whether Any Household Member is Elderly

Are you or anyone (else) in your household 60 years of age or older?

Whether Any Household Member is Disabled

Is anyone in your household disabled? Please count as disabled persons who receive SSI benefits because of a disability, social security disability checks, disability retirement pensions, railroad disability payments, or veteran disability benefits.

Financial Assets

Please think about any cash (you have/your household has) on hand, money in checking and savings accounts, savings bonds, individual retirement accounts, pension plans, stocks and

bonds, money market funds, and savings for burial expenses. Are these amounts together less than [fill AMOUNT]?

Vehicular Assets

Do you (or does anybody in your household) own a car, truck, van, or motorcycle? Please include any cars, trucks, vans, or motorcycles that your are making payments on.

What (is/are) the year(s), make(s), and model(s) of the car(s), truck(s), van(s), or motorcycle(s)?

PROBE: Please include any vehicle owned by a household member.

Please tell me for each vehicle whether the vehicle is used primarily for either business purposes or to transport a disabled person?

How much is currently owed for this vehicle?

Earnings

How much (does NAME/do you) earn on this job, before taxes and any other deductions are taken out?

PROBE: What is (NAME'S/YOUR) gross pay?

Medical-Care Expenses

Now, think about the people in your household who are disabled or age 60 or older. What were their out-of-pocket medical expenses last month?

PROBE: Include doctor and hospital bills, prescription drugs and lab tests or x-rays, and other medical expenses you paid out-of-pocket. Please exclude anything that you'll be reimbursed from Medicaid, Medicare, or health insurance.

Dependent-Care Expenses

Last month, how much did (you/your household) pay out-of-pocket for the care of children or other dependents so that someone in your household could go to work, school, or a training program?

Shelter Costs

Think about the money (you/your household) spent for rent, mortgage, property taxes, and all utilities combined last month. Was that amount less than $190?

PROBE: Utilities include electricity, gas, water, air conditioning and heating.