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PARTICIPATION RATES IN THE FOOD STAMP
PROGRAM: ESTIMATED LEVELS, BY STATE

Gary Bickel and Maurice MacDonald

UNIVERSITY OF WISCONSIN-MADISON



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ABSTRACT

This paper presents preliminary estimates of the number of persons eligible for food stamps, on average throughout 1974, for each state and the nation. Previous estimates of the number of food-stamp eligibles have all been based on national household sample data that did not allow an adequate allocation of the resultant national figure among states. By contrast, this study begins with U.S. census household income data at the state level, and projects these data to current levels as the basis for determining the size of the 1974 eligible population in each state under current Food Stamp Program eligibility standards.

In addition to gross household incomes, other factors that enter into the determination of food stamp eligibility are considered, but only on a national basis. These factors include an estimate of the assets-screen effect, the effect of underreporting in census income data, and an allowance for the effect of allowable deductions from gross income under Food Stamp Program criteria.

It should be emphasized that the eligibility figures presented here should be interpreted as conservative, "baseline" figures, upon which final estimates for states can be developed. Preliminary work indicates that these final estimates will range from about 25 to 45 percent higher in each state than our Assumption A figures, which are derived solely from estimated distributions of current gross household incomes.

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PARTICIPATION RATES IN THE FOOD STAMP PROGRAM:

ESTIMATED LEVELS, BY STATE

Since 1968, the Food Stamp Program has been criticized for its inability to enroll even a majority of the persons who are eligible for food stamp benefits (U.S. Senate, 1973; Citizen's Board of Inquiry into Hunger and Malnutrition in the United States, 1968). Because eligibility is restricted to households with financial resources that indicate they are unable to purchase a minimally adequate diet without food stamps, the welfare implications of this criticism are very serious. Nevertheless, there is empirical support for the charge. According to a staff study for the Subcommittee on Fiscal Policy of the Joint Economic Committee of Congress, 37 million persons in the nation were eligible for food stamps during March 1974 (U.S. Congress, 1974b, p. 5), while in that same month 13.6 million actually received the stamps (U.S. Department of Agriculture, Food and Nutrition Service, 1974). Hence in the first quarter of 1974, only about 35 percent of all eligible persons participated in the program. At that time, some 500 counties and other governmental units across the country still maintained the earlier Family Food Distribution Program (the "commodity" program) instead of food stamps, with nearly 2 million participants (U.S. Department of Agriculture, Food and Nutrition Service, Program Reporting Staff, monthly reports). The total of about 15.6 million combined-food-program participants still represented only a little more than 40 percent of the eligible population under Food Stamp Program criteria.

If progress toward more adequate food stamp participation is to be monitored, data on participation rates for states are required,

because states are responsible for administering local food stamp offices. As of July 1974, moreover, states were required by law to make food stamp programs available in all counties. By the end of 1974, the Family Food Distribution Program was entirely phased out (except on some Indian reservations) in favor of food stamps.¹ The purpose of this research note is to construct valid estimates of the 1974 Food Stamp Program participation rate for each state and the District of Columbia. For the most part, we shall be concerned with projecting 1974 state eligible populations, since information about the number of food stamp recipients is readily available from the Food and Nutrition Service, United States Department of Agriculture.

Estimating State Eligible Populations: An Overview

Federal regulations specify uniform national standards for the maximum levels of income and assets that a household of a particular size may have and still qualify for food stamps. Of the two types of criteria, the income standard is the more fundamental determinant of eligibility. The asset limitations are relatively nonstringent,² in the sense that households eligible on income grounds would seldom be disqualified for exceeding the asset standard. Current data on the liquid assets of low-income households are not readily available. Earlier findings, however, tend to validate the assumption that a relatively small proportion of households eligible for food stamps on income grounds, perhaps 15 to 20 percent, are ineligible on asset grounds.³ Consequently, our approach is to postpone detailed consideration of the asset screen at this stage, and to concentrate first

on developing sound estimates of the number of households, and persons in such households, with current income levels lower than the income standard for food stamp eligibility.

For each state and size of household, the data requirements for that computation are the following:

- 1) a cumulative percentage distribution of households by income;
- 2) the food stamp program's maximum allowable income;
- 3) the total number of households.

By applying the appropriate income maximum to each cumulative percentage distribution, we first estimate the percentage of all households of a given size that are eligible for food stamps. Next, multiplication of the resulting percentage by the number of households of that size produces the estimated number of eligible households. These two steps are repeated for every household size. Then, multiplying the number of eligible households by their respective sizes and cumulating products gives the total number of eligible persons in the state.

Once the data are at hand, this procedure is simple. However, these data are not readily available; they must be generated, as described in following sections. Before turning to those descriptions, the next section explains other complications, which arise from both the need for 1974 participation rates and a divergence between census and food stamp definitions of income.

Some Complications Affecting the Estimation Method

Income data collected by the Census Bureau, the data used here, are limited to total money income received by the household before payments

for personal income taxes or any other deductions. By contrast, the food stamp income maximums are for household net income, which is total money income less a host of deductions, including allowances for the following: 10 percent of wages or salaries, not to exceed \$30 a month; all mandatory deductions from earned income, such as income taxes, Social Security taxes, and union dues; all medical expenses if they exceed \$10 a month; child care payments if they permit a household member to be employed; tuition and mandatory educational fees; unusual expenses like funerals. Furthermore, there is a final deduction for that portion of shelter costs (rent, utilities, and one telephone) that exceeds 30 percent of: total income minus all aforementioned deductions.

The shelter deduction alone can cause total money income to exceed household net income by a substantial margin. But, for example, even without the shelter deduction--or any other except federal tax and Social Security withholdings--a working father with three dependents, filing a joint income tax return without itemizing or deducting state and local taxes, could have \$7200 in gross earnings and still qualify for food stamps because his net income would be less than the \$6000 annual maximum for a four-person household (Blechman et al., 1974, p. 192).

Unfortunately, there is no accurate way to compute household net income from the published census data on total money income and other reported characteristics. A more elaborate procedure utilizing the United States Census Public Use Sample for each state could generate estimates of the basic wage and excess-shelter-cost allowances of low-income households, while standard state and federal tax tables

and Social Security withholding rates also could be integrated into such an estimate of the multiple deductions allowable from gross income.

For certain important deductions, however, such as medical, educational, and child care costs, alimony, union dues, and unusual expenses, no readily usable data are available. The inherent limitations of available data thus render impossible a comprehensive measurement of the difference between census gross income and food stamp net income of low-income households, while any meaningful partial estimate along these lines would involve the rather costly procedure of drawing on the Census Public Use Sample.

Consequently, the approach we take at this stage is to derive a minimum baseline estimate of the number of food stamp eligible households and persons on the unrealistic assumption (Assumption A) that no deductions are taken from gross income. The food stamp net income maximum for each household size is here applied to the distribution of households by total money incomes. This of course produces a substantial undercount of the true numbers of households and persons eligible for food stamps in each state, but it does provide a basis for further work.

To get some idea of the relative magnitude of downward bias that results from the unrealistic assumption of zero deductions from gross income, we next calculate the number of eligible households and persons on the alternative assumption (Assumption B) that the total amount of such deductions averages 9 percent of gross income in each household-size category.⁴ This is still a highly conservative assumption. It should be noted, for example, that in the hypothetical case quoted

above, the estimated reduction from gross to net income due to the allowance for federal income and payroll tax withholdings amounts to at least 17 percent of gross family income. Similarly, findings from the recent Chilton Corporation survey of November 1973 administrative records of food stamp participants show an average value for all deductions of \$53 per household (U.S. Congress, 1974a). When this figure is compared with the average income of food stamp recipient households in June 1973, as reported by USDA (U.S. Department of Agriculture, Food and Nutrition Service, Food Stamp Division, 1974), the implied average rate of deductions amounts to 19 percent of gross income.

It appears that our Assumption B, which embraces a 9-percent average level of deductions from gross income, probably represents only about one-half (or less) of the actual average value of such deductions allowable under food stamp criteria. The effect of the Assumption B level of deductions is to increase the number of eligible persons in the nation by more than 15 percent over the Assumption A baseline figure, an increase of from 10 to 23 percent in the various states. A more realistic estimate of the average level of allowable deductions for families with net incomes close to the food stamp maximums might easily double the size of this proportional increase in the number of persons eligible for food stamps on income grounds.

So far we have noted two major deficiencies of estimating the total number of food stamp eligibles from census household gross income data: the omission of the asset-screen effect on the one hand and of the allowable deductions from gross income on the other. A fortuitous

aspect of these two omissions, however, is that their effects offset each other. That is, the upward bias in our estimates resulting from the omission of the asset screen is counterbalanced by the downward bias resulting from the omission of the allowable deductions. The magnitudes of the two effects, moreover, appear to be roughly comparable. The hypothetical trial figure for average deductions used in our alternative count of eligibles (9 percent of gross income) has an effect on the number of eligibles in the nation equivalent to over 60 percent of our preliminary estimate of the asset-screen effect.

A more realistic figure for the average level of deductions would expand the population eligible on income grounds more than enough to fully offset the reduction in number of eligibles due to the resource limitation. In other words, the downward bias in our basic estimates due to the omission of allowable deductions from gross income appears to be significantly greater than the upward bias due to the omission of the asset-screen effect. Thus these two major offsetting factors alone indicate that our baseline Assumption A estimates give a quite conservative or understated count of the true number of persons in each state and in the nation who are eligible for food stamps on both income and resource grounds.

There are, however, a number of additional problems inherent in the underlying household income data and in our method of estimating from them that also will cause biases of various degrees and directions in the estimates. By far the most significant of these is the major undercount that results from using annual income data to estimate the number of eligible persons when eligibility criteria are actually based

on quarterly or monthly incomes with no requirement for carryover or averaging over a longer period. This important aspect of our estimates (and of all other estimates derived from annual income data) is discussed in detail below. Several other limitations in our data and method should also be noted.

First, while our objective is to calculate 1974 food stamp participation rates, the most recent year for which data on the national size distributions of household income are available is 1973. Household incomes probably will show some growth from 1973 to 1974, although in real terms this growth will be slight, given the present combination of recession and high inflation rate. For the relevant group of lower-income households, the average growth in real income from 1973 to 1974 may even be negative, and at best will be very modest. Thus, the 1973 income-distribution data, while not ideal, should provide an excellent proxy for the 1974 count of lower-income households. To the extent, however, that real household income grows during the year, our estimates will tend to overstate the proportion of all households eligible for food stamps on income grounds.

But again there is an offsetting factor: 1973 also is the latest year for which data on total numbers of households are available, while by 1974, normal population growth will have increased the number of households of most sizes in most states. A major step in our computational method involves multiplying the proportion of eligible households of each size by the total number of households of that size in a given state to produce the estimated number of eligible households of that size. Consequently, a given proportional error in the total

number of households of given size, due to use of the 1973 figures, would introduce a much greater (downward) bias in our estimate of the number of eligible households than would the same-sized proportional error in the percentage of households eligible, resulting from the use of the 1973 data on income distributions. If any net bias results from the use of the 1973 data, therefore, it may well be conservative in effect--that is, it may tend to undercount the eligibles in 1974 rather than to overcount them--and in any case it must be quite small.

Second, certain households that are categorically eligible for food stamps are not explicitly considered in our approach, and thus may be omitted from the counts we obtain. In all states "public assistance households" (those in which all members are welfare recipients) are automatically eligible for food stamps, by statute, with no additional income or resource test. The same is true in all but five states for most aged, blind, and disabled recipients of Supplemental Security Income (SSI).⁵

In states with high welfare payments, a family with sufficient exempted earnings and/or unusually large "special need" requirements recognized by its welfare department can have a net income higher than the maximum set by the Food Stamp Program and yet be eligible (statutorily) for food stamps. Such households are omitted from our estimates. The number of these, however, must be relatively small for the nation as a whole.

A more important omission is that of SSI-recipient households. The federal income-guarantee levels under SSI are considerably lower than the food stamp income maximums, while the federal SSI support

standards plus state supplementary payments (SSP) are lower in all but the five highest-payment states (see note 5). (The asset screen is also more stringent for SSI than for food stamps.) One of the most significant aspects of the SSI system, however, is that it substantially disregards earned income.⁶ Consequently, SSI recipients can have total incomes far above the food stamp maximums: in the 24 nonsupplementing states up to nearly twice the food stamp maximum incomes, and in the supplementing states to considerably higher levels.⁷ These high-income SSI households are all omitted from our estimates of food stamp eligibles.⁸

Third, the basic census data on household income that underlie our estimates are known to suffer from a general underreporting of incomes of most types. The Current Population Survey income data for 1972 have been estimated by the Bureau of the Census to be underreported by an overall average amount of just under 10 percent, with wages and salaries showing virtually no underreporting, public assistance and Social Security receipts being underreported by 8 and 26 percent respectively, and property income components being underreported by over 50 percent (U.S. Bureau of the Census, 1973, Table K; 1974c, p. 54). Adjusting the reported census household income distributions upward by a uniform 10 percent would lower the count of eligible households and persons obtained through our method of estimation. The reduction in number of eligible units in the nation would range from 14 to 17 percent for the various household sizes and would average about 16 percent of the total number of eligible persons.

Finally, one additional very minor source of overcount in our estimates may be noted: our projected rate of inflation over the period 1973-1974 has turned out to be too conservative (see note 10). This results in an inadequate adjustment in bringing into alignment (measuring in dollars of comparable purchasing power) the 1974 food stamp income maximums and our estimated 1973-1974 household income distributions. The upward bias attributable to this source is very small, however: approximately 1 percent of the total number of eligible persons in the nation.

The likely net result of the combined effects of these various, only partially offsetting, biases is discussed below, after a description of the basic method and the resulting estimates.

Cumulative Percentage Distributions of Households by Income Size For States

Published tabulations of the 1970 census can be used to derive cumulative percentage distributions of households by 1969 income, for states and for the nation as a whole (U.S. Bureau of the Census, 1972, Table 258; 1972-1973, Tables 206). In addition, the March 1974 Current Population Survey provides a national cumulative percentage distribution for income in 1973 (U.S. Bureau of the Census, 1974b).⁹ (Comparable national data for total money income in 1974 will not be available until 1975, which prevents direct estimation of state eligible populations for 1974.)

Utilizing these 1969 state, 1969 national, and 1973 national distributions to generate state cumulative percentage distributions involves one reasonable assumption about the relationship between state

and national distributions, namely that the 1969 state/national ratio of the percentages of households below each income-class boundary remains constant through 1973. That is, if S_{69i}/N_{69i} is the state/national ratio of percentages of households having income in or below some income bracket i (where i is in constant dollars), and S_{73i}/N_{73i} is the corresponding ratio for 1973, we assume

$$(1) \quad S_{69i}/N_{69i} = S_{73i}/N_{73i}.$$

Since S_{69i} , N_{69i} , and N_{73i} are known from 1969 and 1973 cumulative percentage distributions, we can solve (1) for S_{73i} .

To see how this method accounts for income growth in the period 1969-1973, consider

$$(2) \quad S_{73i} = (N_{73i}/N_{69i}) (S_{69i})$$

and suppose that i is chosen to coincide with the Food Stamp Program's maximum allowable income for 1973, which implies that S_{73i} is the percentage of eligible households in 1973. Due to income growth, fewer households have low incomes in 1973 than in 1969, so (N_{73i}/N_{69i}) is less than one. Therefore, in each state, the predicted percentage eligible in 1973 will be less than the actual percentage eligible in 1969, using the 1973 income maximum. And since S_{69i} is reduced by the same fraction in all states, states with a relatively high (low) predicted 1973 percentage eligible will be those that also had a relatively high (low) percentage eligible in 1969.

By varying i in (1), a complete state cumulative distribution is easily constructed. In practice, it is sufficient to calculate S_{73i} only twice for a given household size, once for the income bracket above the allowable maximum for food stamps (S_{73a}) and once for the income bracket below that maximum (S_{73b}). Then, linear interpolation

between S73a and S73b predicts the percentage eligible for food stamps. Figure 1 illustrates that interpolation, where S73x is the desired estimate.

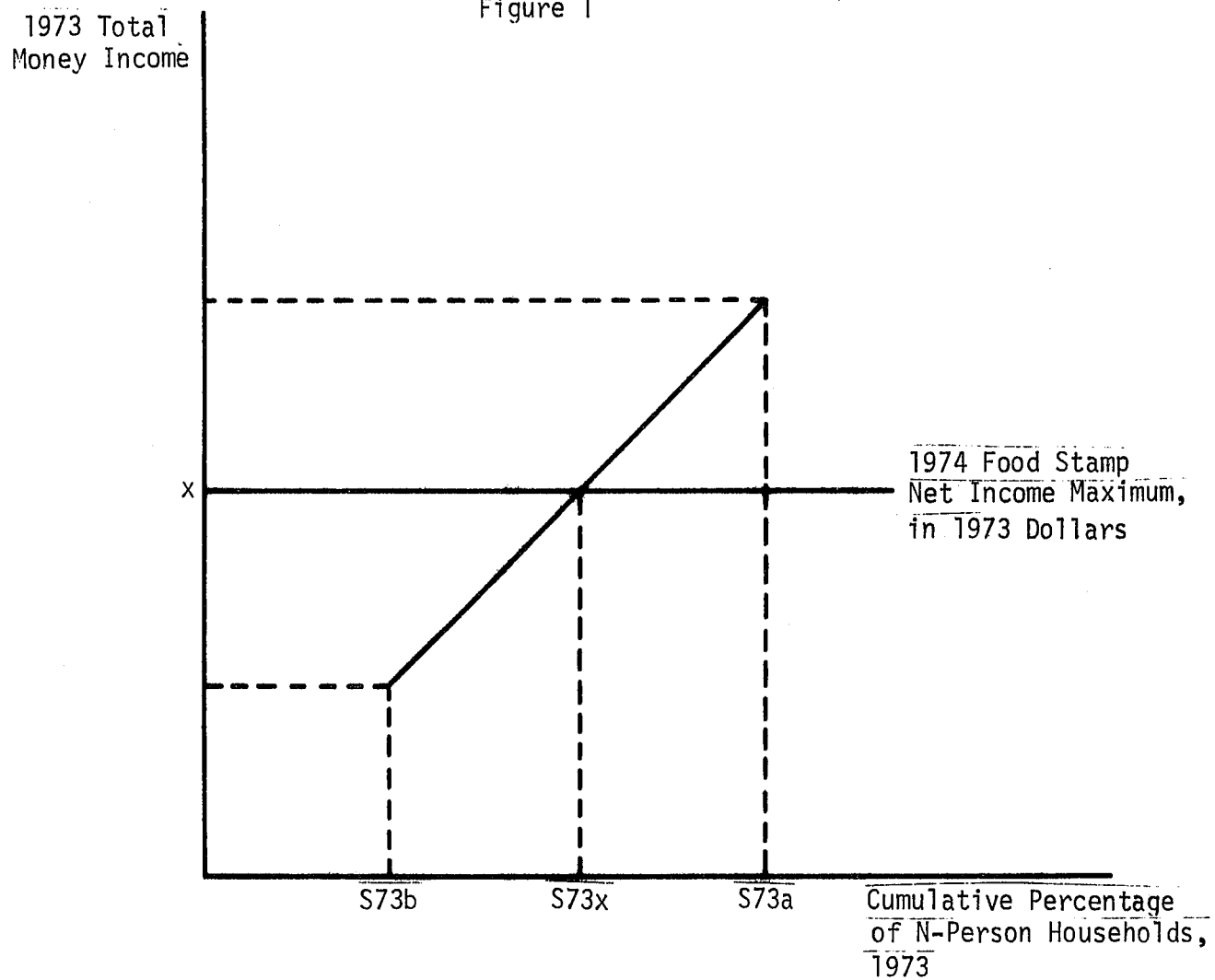
Net Income Maximums for 1973

Annual net income maximums for 1973 (the horizontal line at income level x in Figure 1) were constructed from their 1974 counterparts. After converting monthly income standards to an annual equivalent for 1974, the 1974 food stamp eligibility standards were simply expressed in 1973 dollars. Of course, this deflation presumes an estimated figure for the 1974 average level of the Consumer Price Index. Based on the known monthly rate of inflation during January-May 1974 and the conservative assumption that this rate would decline steadily during the remainder of 1974, the 1974 average CPI level was set at 147.2. That level implies a 10.6 percent increase from the 1973 average CPI of 133.1.¹⁰

1973 State Total Numbers of Households of Each Size

Using national data from the United States Current Population Survey (U.S. Bureau of the Census, 1974b), the ratio of March 1974 to March 1970 household populations was calculated for each household-size category. These ratios were then applied to the 1970 census counts of households in each state to obtain provisional estimates of the number of households of each size by state in early 1974. Next we computed a ratio of the sum of these provisional estimates to the Census Bureau projection of the total number of households in each state as of July 1, 1973 (U.S. Bureau of the Census, 1974a).

Figure 1



Multiplying this second ratio by the provisional numbers for each household size gives the final state estimates for each size category in mid-1973. By construction, the sum of these estimates will be identical (apart from rounding error) to the July 1973 census projection for each state's total. Of course, the proportional distribution by household size of the provisional estimates is maintained in the final estimates. This implies that any divergence among states in proportional distribution of households by size in 1970 is perpetuated in the 1973 estimates, but with a slight convergence toward the national norm arising from the initial use of national ratios for provisional estimates.

1974 Participation Rates

The techniques described in the last three sections enable us to generate data inputs for our method, and then to estimate two eligible populations corresponding to the alternative treatments of net income under Assumptions A and B. The first two columns of Table 1 contain these estimates. Column 3 displays the peak monthly number of persons who participated in each state's Food Stamp Program during January-September 1974. For the majority of states, this peak participation level was reached in the period after July 1, and for all but a handful of states the earlier Family Food Distribution Program was entirely phased out by the end of this period. Columns 4 and 5 give the reported food stamp and commodities program participation levels, respectively, for September. By then the commodities program was limited to Indian reservations, and only four counties in the nation still lacked food

Table 1: 1974 Food Stamp Participation Rates, by State

State	Estimated Number of Persons Eligible for Food Stamps, 1974 Average Monthly Level ^a		Peak Monthly Number of Food Stamp Participants, Jan.-Sept. 1974	Sept. 1974 Food Program Participation Levels		Peak Monthly Food Stamp Participation Rate, Jan.-Sept. 1974	
	Assumption A	Assumption B		Food Stamps	Commodities	Assumption A	Assumption B
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
						(3):(1)	(3):(2)
Alabama	840,943	950,000	338,762	338,507		40.3 %	35.7 %
Alaska	36,231 ^c	41,021 ^c	21,769	14,065		60.1	53.1
Arizona	295,437	342,257	111,520	107,892	39,234	49.8 ^b	43.0 ^b
Arkansas	536,212	608,199	249,514	245,940		46.5	41.0
California	2,061,026	2,463,220	1,404,824	1,354,645		68.2	57.0
Colorado	284,448	337,846	138,567	131,776		48.7	41.0
Connecticut	200,085	242,165	145,313	139,916		72.6	60.0
Delaware	59,352	69,815	19,361	19,361		32.6	27.7
D.C.	106,558	121,998	117,830	112,750		110.6	96.6
Florida	1,216,832	1,384,362	514,847	514,847		42.3	37.2
Georgia	939,556	1,064,085	413,084	413,084		44.0	38.8
Hawaii	77,051 ^c	91,106 ^c	66,493	66,238		86.3	73.0
Idaho	112,620	131,966	33,794	33,794		30.0	25.6
Illinois	1,132,189	1,265,177	878,455	840,574		77.6	69.4
Indiana	529,781	639,638	194,791	193,319		36.8	30.4
Iowa	351,467	422,172	116,020	106,389		33.0	27.5
Kansas	293,684	350,017	51,531	51,531		17.6	14.7
Kentucky	738,860	836,263	401,992	398,007		54.4	48.1
Louisiana	915,320	1,023,277	530,589	502,279		60.0	51.9
Maine	145,872	176,190	84,824	84,824		58.2	48.1
Maryland	388,111	458,903	258,710	245,344		66.6	53.5
Massachusetts	507,551	588,459	85,687	85,244		16.9	14.6
Michigan	803,946	944,400	581,754	575,550		72.4	61.6
Minnesota	413,658	493,605	184,142	170,920	1,291	44.5	37.3
Mississippi	721,943	792,585	351,117	348,321		48.6	44.3
Missouri	751,140	874,100	290,932	286,758		38.7	33.3
Montana	101,775	121,939	33,393	33,393	6,818	39.5 ^b	33.0 ^b
Nebraska	206,988	246,157	50,447	44,334		24.4	20.5
Nevada	50,224	56,845	21,850	20,617		43.5	38.4
New Hampshire	69,724	86,236	32,000	32,000		45.9	37.1
New Jersey	576,559	683,450	406,323	406,323		70.5	59.4
New Mexico	250,750	283,877	161,695	154,757		64.5	60.0
New York	1,940,963	2,288,298	1,199,870	1,199,870		61.8	52.4
North Carolina	1,061,150	1,197,990	327,038	324,012	497	30.8	27.3
North Dakota	107,510	126,880	21,666	18,361	6,572	23.2 ^b	19.6 ^b
Ohio	1,079,640	1,225,301	778,856	748,700		72.1	63.6
Oklahoma	483,835	561,542	150,081	150,081		31.0	26.7
Oregon	239,428	284,609	171,903	167,390		71.8	60.4
Pennsylvania	1,259,881	1,481,733	746,567	745,693		59.3	50.4
Rhode Island	101,256	116,593	74,947	74,016		74.0	64.3
South Carolina	616,186	693,020	370,991	354,484		60.2	53.5
South Dakota	143,367	166,359	29,637	29,637	13,942	31.0 ^b	26.7 ^b
Tennessee	884,938	1,008,195	351,579	329,331		39.7	34.9
Texas	2,121,721	2,435,175	1,104,190	1,055,960		52.0	45.3
Utah	129,339	157,552	60,939	43,153		47.1	38.7
Vermont	56,798	67,851	40,345	38,165		71.0	59.5
Virginia	723,518	836,024	217,575	217,575		30.1	26.0
Washington	330,199	387,849	261,592	238,532	9,769	79.2	67.5
West Virginia	381,851	441,205	244,615	213,888		64.1	55.4
Wisconsin	461,511	541,664	132,313	128,685		28.7	24.4
Wyoming	42,812	51,679	11,018	9,272		25.7	17.9
Total U.S.	27,881,796	32,260,849	14,491,048	14,280,104	78,123	52.0	44.3

Notes to Table 1

^aFor California, Massachusetts, Nevada, New York, and Wisconsin, the figures in Columns 1 and 2 include substantial numbers of statutorily ineligible recipients of Supplemental Security Income and/or State Supplementary Payments. In September 1974, these numbers were: California--577,255; Massachusetts--111,881; Nevada--4,495; New York--350,651; Wisconsin--53,727 (United States Social Security Administration, Office of Research and Statistics, Division of Supplemental Security Studies, "Advance Release of SSI Program Data for September 1974," Nov. 1, 1974).

^bRate based on September 1974 combined-food-program participation levels.

^cFigures calculated on the basis of the net income maximum for the continental United States. Since the maximum allowable net incomes in Alaska and Hawaii exceed those for the mainland, this leads to an undercount.

stamp programs (Community Nutrition Institute, Sept. 26, 1974; Oct. 3, 1974). The national increase in food stamp participation over the period almost exactly matched the decline in numbers receiving commodities, so that the combined-food-program participation level remained virtually constant, varying by no more than 1 percent from June through September.¹¹

The estimated 1974 food stamp participation rate for each state is given in Columns 6 and 7. For all but four states, these are the peak monthly food stamp participation levels (Column 3) divided by the estimated number of eligibles under the alternative Assumptions A and B (Columns 1 and 2). For the four states noted, participation rates are the higher figure for the combined-food-program participation level in the state for September (the sum of Columns 4 and 5) divided by the estimated number of food stamp eligibles in the state.

There are several questions about the interpretation of the figures in Columns 6 and 7 as annual participation rates, since monthly participation levels are compared with counts of eligibles derived from annual income data. On the one hand, the use of peak monthly participation levels from the first three quarters of 1974 will almost certainly overstate the actual 1974 average monthly participation level for most states. Only if food stamp participation were to grow at an unprecedentedly rapid pace over the last quarter of the year could this peak figure fail to overstate the average monthly level for the entire year.¹² Thus, we are using a monthly participation measurement that will tend to overstate to some degree the true 1974 participation rate for every state.¹³

On the other side of the participation-rate calculation, and much more importantly, the use of annual income data necessarily produces a significant undercount of the number of persons eligible during the year under any program that bases income eligibility on current monthly or quarterly income levels, because of the widespread variation in incomes normally occurring over the course of a year. Ideally, for any such program, each month's participation level would be compared with that month's distribution of incomes and resultant number of eligibles, these "true" monthly participation rates then being averaged to find the annual rate. This "ideal" measurement would require current monthly income data corresponding to the income-accounting period actually employed in the large majority of food stamp eligibility determinations.¹⁴

In reality, very little monthly income data exists, perhaps no more than that reported in the recent OEO and HEW income-maintenance experiments. Using these data, however, estimates have been made of the degree of undercount that results when annual income figures are used to estimate the numbers of persons eligible for income supplements, such as food stamps, under monthly or quarterly income criteria (Allen, 1973). The general finding from these estimates is that a program with no requirement for carryover or averaging of income from previous months--in other words, a program comparable (with the exceptions noted) to the food stamp program--will have a much larger average eligible population during any year than it would if program eligibility were based on annual incomes. Or stated alternatively, the estimated number of eligible persons based on

annual income data will significantly undercount the number actually eligible based on current monthly or quarterly income.

This "income-accounting-period effect" may be explained as follows: the use of annual income data would produce the "proper" count of eligibles only if the number of persons in households with usual income levels qualifying them for food stamps, but who fail to qualify in particular (high-income) months, was equaled over the year by the number whose usual incomes are too high for eligibility, but who do qualify in particular (low-income) months. The valid use of 12-month average income levels (annual data) thus implicitly requires a strict condition on the circulation of households, in terms of month-to-month income variation, upward and downward across the program eligibility line. It requires that the number of persons in normally lower-income households (on average, and here defined in reference to the program income maximums) who have above-maximum incomes in particular months is exactly counterbalanced by the number of persons in normally higher-income households with below-maximum incomes in particular months.

This implicitly assumed condition is not met in actuality, however, but rather is violated in a predictable direction. The food stamp income maximums are quite low relative to the entire income distribution: the number of normally below-standard-income households is a small fraction of the number normally above the standards. Thus, the number of normally above-standard households that will temporarily fall below food stamp eligibility levels in particular months is

substantially larger than the opposite number of normally below-standard households that will temporarily rise to above-maximum incomes.

This could fail to be true only if the degree of income variability were so much greater among those households with normally below-standard incomes than among those with normally above-standard incomes that it fully offset the large difference in relative size of the two groups. In fact it is the case that low family incomes, especially wage earnings, are in general more variable than higher ones, within as well as between years (Benus, 1974; Mirer, 1974), but the overall differential is much too small to meet the required condition. The degree of income variability that exists at higher income levels, although proportionately declining, is nevertheless substantial (Morgan et al., 1974; Kohen, Parnes, and Shea, 1973), while a disproportionately large share of many of the lowest incomes consists of extremely stable income types. Additionally, households that are permitted to average their incomes on an annual basis for food stamp purposes probably constitute a fair proportion of all those normally lower-income units with occasional higher-income periods. These should be excluded from the critical comparison altogether--making the required condition even more unrealistic for the rest of the population.

The Appendix clarifies further complications related to the accounting-period problem that can lead to confused interpretations of the program participation rates in Table 1.

Summary: Net Effect of Estimation Biases

While the state estimates presented in this study are explicitly derived on income criteria alone, we believe it is clear that they can serve as reasonable baseline estimates of the total number of persons currently eligible for food stamps under both the income and assets criteria. Even the larger of the two estimates (Assumption B), we believe, should definitely be considered a highly conservative estimate of the true number of eligibles in each state.

Since the various adjustment factors we have considered to compensate for the several important biases inherent in our data and method are only available, in even a rough form, on a national basis, we have not explicitly applied them to each state. These adjustments could be made, nevertheless, in the estimates given for each state, and in the absence of more appropriate state information, this would improve the accuracy of the estimates. We will present here, however, only the national adjustment factors.

The various sources of bias in the basic estimates are listed in Table 2, along with the estimated direct proportional effect of each factor on the number of persons eligible for food stamps, as well as the indirect effect on the accuracy of our basic estimates. As noted, there is a considerable range of uncertainty in several of the most important of these factors, even on the national level, so we can gain only a general idea of their overall combined effect.

Finally, in Figures 2-A and 2-B, we show two possible outcomes based on these estimated ranges of the bias attributable to each

source. In both cases, the combined effect results in a final estimated number of persons eligible for food stamps in the nation in 1974 that lies above our higher (Assumption B) estimate. We believe that the "true" number of eligible persons in the nation thus lies, with a high degree of probability, within the range of 34 to 39 million, that is, from 4 to 20 percent above our higher estimate. A similar result should apply, although with a somewhat lesser degree of confidence, in each individual state.

TABLE 2

Estimated Effect of Major Influencing Factors on Total Number of
Persons in U.S. Currently Eligible for Food Stamps,
and Corresponding Bias in Estimated Number of Eligibles Resulting From
Omission of Such Factors (Plus Other Sources of Estimation Bias)

Major Influencing Factor:	Estimated Proportional Effect on Total Number of Eligibles in U.S. ^a	Estimation Bias Attributable To:	Estimated Degree of Bias in Baseline Estimates ^a
Assets limitation	- 20% ^b	Omission of assets screen effect	25% overcount
Allowable deductions from gross income	+ 30% ^c	Omission of allowance for income deductions	23% undercount
Statutory eligibility of Public Assistance & SSI households	very small ^d	Omission of PA and SSI statutory eligibles	slight undercount
"Part-year income-accounting-period effect" low to intermediate estimate of effect	+ 40-60% ^e	Use of annual household income data	29-38% undercount
	(- 16%)	Underreporting of household incomes in census data ^f	19% overcount
	(- 1 %)	Too-low projection of 1973-1974 period inflation rate ^g	1 % overcount
	----	Effect of 1973-1974 growth in numbers and in incomes of households ^h	offsetting effects: net result minor but unknown
Overall Combined Effect	+ 21-38% over Assumption A baseline estimated	Overall Net Bias	5-16% Undercount in higher Assumption B estimates

Notes to Table 2

^aThe percentages in the two columns represent the same relative changes or difference, but calculated on different bases.

^bRepresents a liberal estimate of the proportion of all persons eligible on income grounds in the nation who would be excluded on grounds of excess asset holding. See note 3.

^cThe national average proportional increase in number of eligibles resulting from overall average deductions from gross income amounting to 18 percent of gross income (see pp. 5-6). The magnitude of this effect varies among states, from an increase of 20 to about 45 percent in the number of eligibles, depending on the slopes of the household gross income distribution curves in each state.

^dSee p. 9, and note 5.

^eRepresents the estimated "true average level" or "full-year-equivalent" level of eligibility based on monthly incomes, expressed as a percentage increase over the number of eligibles if determined by annual incomes. See pp. 18-21, and the Appendix for fuller discussion.

^fSee p. 10.

^gSee p. 10, and note 10.

^hSee p. 8.

Figure 2-A

Adjustment of Baseline Estimate (Assumption A) to Allow for Effects
of Major Influencing Factors on the Total Number
of Persons in the Nation Eligible for Food Stamps,
Low Estimate of Income-Accounting-Period Effect

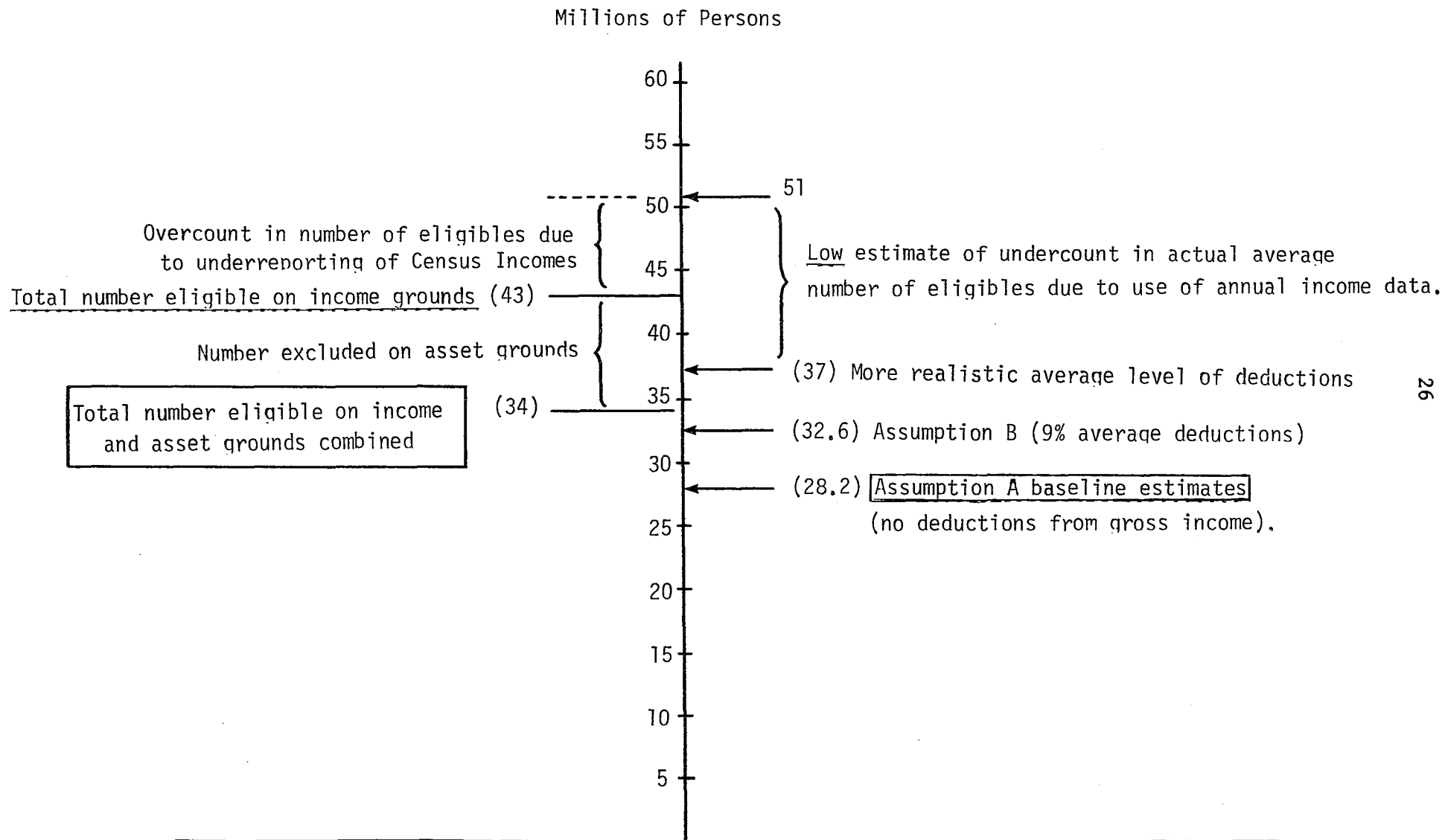
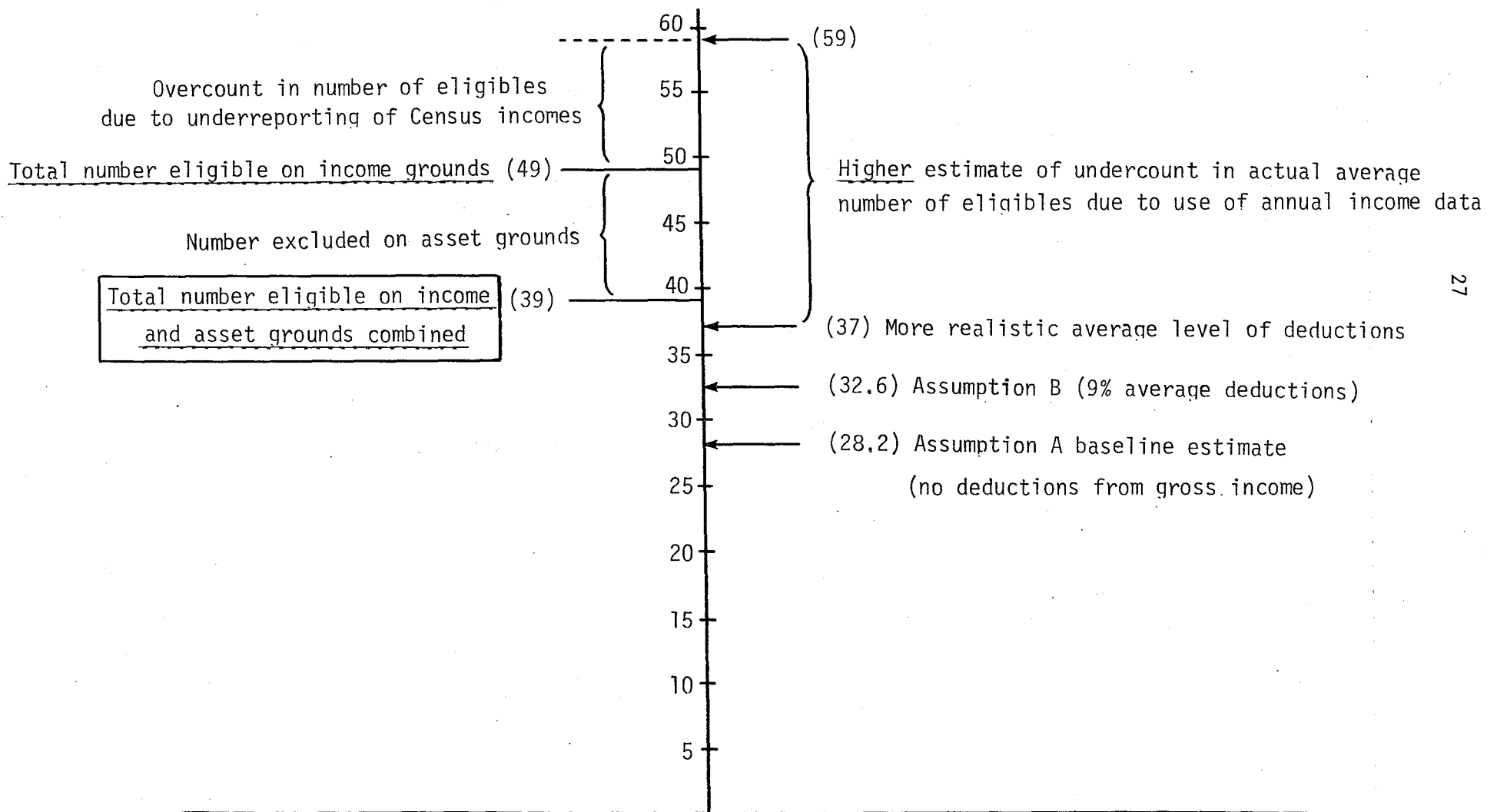


Figure 2-B

Adjustment of Baseline Estimate (Assumption A) To Allow for Effects
of Major Influencing Factors on the Total Number of Persons in the Nation Eligible for Food Stamps,
Intermediate Estimate of Income-Accounting-Period Effect

Millions of Persons



APPENDIX. "TURNOVER" AND "ACCOUNTING-PERIOD" EFFECTS ON ELIGIBILITY LEVELS

There are two related but distinct aspects to the part-year income-accounting problem for eligibility estimations that can easily become sources of confusion. One may be called the simple "turnover" aspect: one result of fluctuating incomes is that different households will be eligible in different months, and the total number of distinct households or persons thereby eligible at some time during the year (the "total annual count" of eligibles) will be much greater than the number eligible in any given month or eligible on average over the 12 months. And all three of these eligibility measurements will be higher than the number of persons who are continuously eligible throughout the year (the "full-year count of eligibles").

The other aspect, which may be called the "income-accounting-period effect," is also a consequence of fluctuating incomes. It refers specifically to the differential between the average monthly eligibility level over a year's time, based on monthly or quarterly incomes, and the lower annual eligibility level based on annual incomes. This distinction between "turnover" and "accounting-period" effects in the measurement of eligibility levels may be clarified by examining the relationships between the four types of eligibility measurements mentioned so far, and their necessary orders of magnitude.

I. Total Annual Level. This measure of eligibility is necessarily the largest, setting an upper bound for the other three. It is the cumulative count of all persons ever eligible over the course

of a year, including both short-term rotating and continuous full-year eligibles.

II. True Average Level. This measure, based on current-period incomes, could also be termed the "Full-Year Equivalent Level" of eligibility, or the aggregate number of monthly "eligibilities" throughout the year--irrespective of the (varying) eligibility periods of the (changing) group of actual eligibles--divided by 12. This measure is the most meaningful of the four types described here (the "true" measure of the average size of the eligible population under the program during a given year); it omits the double counting implicit in the Type I measure due to the rotation or "turnover" of particular eligible units. In principle, this is the proper measure to compare with actual participation levels in order to derive the true rate of program participation among the eligible population. Unfortunately, it also is the hardest measure to obtain directly, given the absence of monthly or quarterly household income data.

III. Apparent Average Level. This measure, based on annual income, is the number of households or persons who would be eligible on average over the year (on the basis of their annual incomes), although not necessarily in all months. This, of course, is the count derived from annual income data, including both the estimates presented in this paper and all other national estimates derived from Current Population Survey data. It may be described as the count of people who are "normally eligible," or within the program's income limits "on average" over the period of a year. For farmers, other self-employed persons, teachers, and others who average their incomes

on a 12-month basis for food stamp purposes, but only for them, this count will coincide with the Type II "True Average" eligibility level. For the general population the Type III count will fall below the Type II count. It is this differential that we have called the pure "accounting-period effect" on eligibility measurement.

IV. Continuous Full-Year Level. This is the count of persons who remain eligible throughout the entire year. It sets a lower bound to the other measures, although it is not of much importance in an actual world of widespread fluctuating incomes.

Even more measures might be envisaged, such as the "peak monthly" count of eligibles that results from income fluctuations falling into seasonal patterns for many households simultaneously. Although important, perhaps, for administrative scheduling, these other measures are not relevant to the problem of eligibility determination and estimation.

Essentially, it is only the difference between the Type II measurement (the proper count to use as denominator in participation-rate calculations) and the Type III measurement (the only count directly obtainable from annual income data) that is directly relevant to the problem of accurate estimation of the total level of eligibility and rate of program participation. It is the differential between these two types of eligibility measurement that we have called the "accounting-period effect." In contrast, the broader "turnover effect" of fluctuating incomes under any income-supplementing program is not relevant to the eligibility-estimation problem as such, although the two effects partly overlap (the source, no doubt, of the frequent confusion between them).

The quantitative evidence that is available on the pure "accounting-period effect"--derived, as mentioned above, from the one set of monthly income data extant--shows a surprisingly large undercount of the broad Type I eligibility level in estimates based on annual incomes (Type III). When estimates were calculated for the entire group of urban and rural low-income families covered in the OEO-HEW data, the Type I eligibility level was as much as 140 percent above the Type III count (that is, nearly two and one-half times as great!). The rural household data were regarded as inadequate for reliable estimation, however, given the small size of this part of the sample (296 families in Iowa and North Carolina), so the analysis was repeated with the excellent urban data alone (5231 families in New Jersey-Pennsylvania, Denver, and Seattle), although it was recognized that intra-year income variability probably is greater for rural than for urban low-income households, and that nearly half of all potentially eligible families under income-support systems of the type involved would be rural (Allen, 1973, p. 75). The findings from the urban data alone, however, still showed the Type I eligibility level to be 59 percent higher than the Type III annual-income-based count, subject to detailed specific assumptions about the monthly or quarterly accounting procedures used, as well as according to other program variations (Allen, 1973, pp. 69-97; U.S. Congress, 1974b).¹⁵

Thus, while we do not yet know its exact magnitude, it is clear that there is a substantial undercount present in all estimates of Food Stamp Program eligibility that are based (incorrectly, but

necessarily) on annual income data. On the basis of the available estimates of this effect, the undercount must result in a count at least 20 to 30 percent below the true (Type II) annual eligibility level for food stamps. Taking account of rural as well as urban income variability, the undercount could easily be even greater.

NOTES

¹For excellent summary descriptions of legislative and administrative developments in the Food Stamp Program (and public food programs generally), see Community Nutrition Institute.

²The assets portion of the food stamp means test stipulates that the countable resources of all household members may not exceed \$1500, or \$3000 if the household has two or more members at least one of whom is age 60 or over. Countable resources include liquid assets such as cash, savings accounts, stocks and bonds, and nonrecurring lump-sum payments. The home, one car (or two, if needed for employment), household and personal goods, insurance policies and pension funds, and any property essential to self-support are all excluded from the assets test.

For an unusually lucid description of many detailed aspects of current Food Stamp Program provisions and regulations, see Food Research and Action Center, 1974.

³See Projector and Weiss, 1966, Table A 39.

Two "poverty income" levels were utilized in this study. The higher of the two (\$4000 per family of four in 1962) amounts to about \$6400 per family of four in 1974 dollars, closely comparable to the current food stamp (net) income standard of \$6000 per four-person household. For families with incomes below this particular standard and with heads under age 65, the proportion with liquid asset holdings exceeding \$1000 (in 1962 dollars, equivalent to about \$1650 in 1974 dollars) ranged from 1 to 17 percent, depending on age. For two-person or larger families with heads aged 65 or older, the proportion with liquid assets exceeding \$2000 (equivalent to about \$3300 in 1974 dollars) was 39 percent. The weighted average by age distribution of family heads indicates that overall about 16 percent of these low-income families had liquid asset holdings greater than the current food stamp resource limits. (The weighting is by family heads in each age group with total incomes below 125 percent of the poverty line as of the 1970 census.)

When "unrelated individuals" are included in the average, and weighted according to our estimated number of single-person and multi-person eligible households, on the basis of 1973 household incomes, the overall proportion of income-eligible households not passing the food stamp assets screen is 21 percent. This estimate may be slightly overstated, due first to the inclusion of household heads aged 60-64 along with younger families under a \$1500 asset limitation instead of the \$3000 actually allowed, and second to the similar miscounting of households that include a family member, other than the head, over age 60. On the other hand, the true average gross income level corresponding to the food stamp net income standard is probably higher than the income interval considered here, and thus some eligible households with larger assets than reported here also are omitted. On this score, the

true proportion of income-eligible households failing to pass the assets test would tend to be larger than the figure given, although this effect should be very slight. On balance, the estimate given here probably errs on the liberal side.

⁴The actual method employed was to raise the income maximum interpolated into the income-distribution curve by 10 percent. This is equivalent to a downward shift in the distribution curve as such (representing the adjustment from gross to net income) of 9.09 percent at the point of interpolation.

⁵SSI recipients who live as part of larger, nonwelfare households are the only ones who--as part of the entire household--must meet income and asset requirements. The five highest-standard states in terms of State Supplementary Payments (SSP) above the basic federal SSI support levels are California, Massachusetts, Wisconsin, New York, and Nevada. These states are also identified by the Secretary of HEW as food stamp "cash out" states for purposes of SSP cost sharing. (That is, the maximum standard for possible federal obligation in SSP cost sharing--called the "adjusted payment level"--in these states includes, at their option, the cash equivalent of the food stamp bonus value otherwise available to SSI recipients.) Consequently, SSI recipients in these states are statutorily excluded from food stamp eligibility, presumed to be benefitting instead from the "cashing out" of food stamps in the SSI plus SSP support levels. For a detailed description of state supplementation in the SSI system and the state-federal cost-sharing formula, see Bickel, 1974.

⁶The first \$20 of unearned income and first \$65 of earnings every month (or the first \$85 of earnings in the absence of any unearned income) are totally exempted from counting towards the SSI income-guarantee level (currently \$146 per month for single persons and \$219 for couples living independently), and one-half of all additional earnings are exempt.

⁷The general formula for the income cutoff level for SSI eligibility is:

$$(E - 85) \div 2 = S \quad \text{where } E \text{ is the earned-income cutoff level and } S \text{ is the combined standard of support maintained in the given state (SSI plus SSP, if any).}$$

$$\text{or } E = 2S + 85$$

$$\text{For the 24 states with SSP} = 0, \quad E = \begin{cases} 2 \times 146 + 85 = \$377 \text{ (single persons)} \\ 2 \times 219 + 85 = \$523 \text{ (couples)} \end{cases}$$

This compares with current food stamp net income maximums of \$194 and \$273 per month for one- and two-person households. In the SSI-supplementing states, the value of E ranges up to highs of \$669 and \$1253 per month for blind single persons and couples (Massachusetts), \$603

and \$623 per month for disabled and aged single persons (Massachusetts), and \$965 per month for aged or disabled couples (California). Apart from the five "cash-out" states, the value of E exceeds \$400 per month for single persons and \$550 for couples in Hawaii, Maine, Michigan, New Jersey, Rhode Island, and the major parts of Vermont and Washington.

⁸On the other hand, the lower-income SSI-recipient households statutorily excluded from food stamp eligibility in the five "cash-out states" (see note 5) are not subtracted from the present estimates either. There may, however, be households in these states deliberately not signing up for SSI at present in order to preserve their food stamp eligibility. Of the estimated numbers of newly-eligible persons in these states (that is, persons not carried over from public assistance) the proportions that were not receiving SSI benefits in September 1974 ranged from 63 to 78 percent.

⁹These data were obtained originally in pre-publication form through the generous assistance of Vincent P. Barabba, Director of the Bureau of the Census.

¹⁰The actual CPI through May 1974 and the projected levels assumed through December are shown in Table 3.

The more recent monthly experience with the CPI indicates that our assumed growth path over the latter half of 1974 was considerably too conservative. The actual 1974 average CPI level will probably be about 148.0, giving an overall 1973-1974 increase of at least 11.2 percent. The effect of this underestimate of inflation is to overstate slightly the current food stamp income maximums expressed in 1973 dollars, thus tending to overcount the number of eligible households. The magnitude of this error should average about 1 percent of the estimated number of eligibles.

¹¹The combined count of persons participating in the two programs over the period (in thousands) was: 14,261 (June), 14,263 (July), 14,411 (August), and 14,380 (September).

¹²Nationwide program participation levels would have to grow at an average monthly rate of 8.6 percent over the last quarter of 1974 (from 14,301,000 in September to 18,317,000 by December) for the aggregate monthly peak levels in all states (14,491,000 through September) to equal the national average monthly participation level for the year. The actual growth in monthly food stamp participation nationwide was 1.5 million--less than 1.2 percent per month--over the period from January to September.

This comparison might be misleading, given the normal seasonal expansion of the program in the winter months each year, but this appears not to be a very important factor. In the comparable September-to-December periods over the last three years, program growth has averaged 1.5 percent per month.

TABLE 3

Actual Levels of Consumer Price Index
through May 1974 and Projected Levels
through December 1974.

Period Covered	Actual CPI	Monthly Rate of Increase	Projected CPI	Monthly Rate of Increase
Average for 1973	133.1			
December 1973	138.5			
January 1974	139.7	0.87%		
February	141.5	1.29		
March	143.1	1.13		
April	144.0	0.63		
May	145.6	1.11		
June	(147.1)	(1.03)	147.0	0.99%
July	(148.3)	(0.82)	148.3	0.88
August	(150.2)	(1.28)	149.5	0.78
September	(151.9)	(1.13)	150.5	0.70
October			151.5	0.62
November			152.3	0.55
December 1974			153.1	0.49
Average for 1974	147.2			

While this comparison is not strictly appropriate, since the monthly peak figure should be compared with the annual average for each state separately, rather than as a national aggregate, it does indicate the order of magnitude involved.

¹³The fact that the cumulative annual count of specific program participants (or "total annual caseload") is ordinarily a much higher figure, due to the substantial turnover in participating households from month to month, is not relevant here. It is the "full-year equivalent" caseload or "true monthly average" level that measures the actual level of program operation--the level of normal participation during the year, not the count of specific, continually changing, participants. (See the Appendix.)

¹⁴Certain recipients (farmers, other self-employed persons, and farm workers with one employer over the year) have the option of averaging or prorating their expected incomes for periods of up to one year, and some others (teachers and others on regular part-year contracts) are required to average their incomes on a 12-month basis. The annual figures are the proper income data for those households, but such households make up a small fraction of the total. All other recipients are certified on a current monthly income basis. Those with quite regular incomes (for example, many Social Security, public assistance, and SSI recipients) are often certified for quarterly periods or sometimes even longer: their expected future incomes are equal to their current ones. All other recipients, not in the special categories noted and not having predictable future incomes, are ordinarily certified for one month at a time on the basis of their current actual or anticipated incomes.

¹⁵These estimates from Jodie T. Allen's detailed simulation study of the "accounting period" or "turnover" effect set an upper bound to the size of the expansion factor relevant to the present study, which is the full year equivalent level of eligibility over the level of eligibility based on annual incomes (a Type II/Type III comparison). The food stamp eligibility estimates reported by the Fiscal Affairs Subcommittee of the Joint Economic Committee of Congress (U.S. Congress, 1974b) apparently used a lower estimate (35 percent) to produce a figure of 50 million potential eligibles in 1974 "reflecting fluctuations in income" (p. 5).

A recent unpublished study by Harold Beebout (at Mathematica, Inc., in Washington, D.C.) finds a 40-percent differential in the number of persons ever eligible in a year (Type I count) over the number eligible on average in any given month (Type II count). This 40-percent figure was derived from a simulation of wage variability only, using Current Population Survey data on the periods of reported employment and unemployment of low-income family heads.

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