# Medical Out-Of-Pocket Spending in Poverty Thresholds

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**Abstract**
Two options for including amounts for medical out-of-pocket spending (moop) in poverty thresholds like those proposed by the National Research Council are presented. Using an experimental poverty dataset made available to the public by the Bureau of the Census, poverty rates are calculated under each option, with few large differences resulting. Compared to the NRC's proposal, poverty among the aged is lower under both options, but higher than under the current poverty measure. Estimates of amounts for moop in the poverty budgets of uninsured families are discussed in an appendix.

**Interest in a variant of the NRC poverty measure**

Of all the recommendations and suggestions in the National Research Council's report, Measuring Poverty, A New Approach,[1] probably the most controversial has been the proposal that medical needs not be included in the "basic bundle" of food, clothing, shelter, and "a little more" making up the recommended poverty budget. Rather, medical needs were to be the subject of a "medical care risk" index to be developed separately. (page 225) Because medical needs were not to be included in the poverty budget, the panel also recommended that spending out-of-pocket on such needs be subtracted before each family's resources were tested against the thresholds. The report included estimates of poverty rates based on the panel's recommendations. Subsequently, the Bureau of the Census has produced publications that update, expand upon, and modify the panel's proposals. [2]

In the years since the panel's report, several considerations have prompted interest in variations on the NRC panel's measure that would include something for at least out-of-pocket medical needs in the poverty thresholds. Data limitations in the present and in the foreseeable future make it necessary to employ sophisticated statistical modeling techniques to create the NRC's proposed resource measure net of medical out-of-pocket spending. Many household surveys and other datasets that are not devoted to income and poverty measurement nevertheless include poverty status for distributional presentations and for researchers to use as a predictor variable. They would need to gather additional information related to noncash benefits, tax status, and work expenses to make poverty classifications with the more comprehensive resource definition the NRC panel proposed. Additional estimates of each family's medical out-of-pocket expenses may be beyond what is practical.

Moreover, our medical expenditure data sources cannot tell us reliably the extent to which medical out-of-pocket spending (moop) actually reduces current income available for food, clothing, and shelter. Especially when such spending is high, it may be funded in whole or part by reductions in net wealth rather than out of current income as the panel's poverty measure assumes. And, as the panel recognized, we cannot distinguish necessary from discretionary medical spending.

For these and other reasons, outside researchers have advised the Bureau of the Census to consider variations on the NRC proposals that would include amounts for medical out-of-pocket spending in the poverty budget, and so not subtract moop from income. This paper will explore alternative approaches based partly on work done by federal staff in preparation for a 1999 experimental poverty report. [3] The dataset used to compare alternative approaches to including moop-in-the-thresholds is an experimental poverty dataset for 1997 produced by the Bureau of the Census and made available at the Census Poverty Measurement Research internet site. For simplicity, none of the poverty measures presented below make geographic adjustments to thresholds to accommodate differences in the cost of necessities in different parts of the country. The issues discussed here are independent of the question of whether geographic adjustments should be included in our measure of poverty.

**Option 1: NRC method but starting with a spending distribution that includes moop**

An approach developed in preparation for the initial Census report on the NRC proposals follows the steps used by the NRC panel to set its reference family threshold. The NRC report and subsequent Census experimental implementation of the NRC proposal starts with a distribution of spending on food, clothing, and shelter plus utilities by married couples with two children. The threshold for this reference family type is set at around 1.2 times 80 percent of median spending by such families on food, clothing, and shelter plus utilities. [4] Eighty

percent of median falls between the 30th and 35th centiles on the distribution, which the panel judged to be a reasonable level. The amount for food, clothing, and shelter plus utilities (FCSU) is multiplied by 1.2 to allow "a little more" for other necessities, such as household supplies and personal care needs. This reference family threshold then is adjusted for families with different numbers of adults and children by means of a range of equivalence scales the panel suggested.

The first option, I'll call moop-in-the-thresholds, or *moopitt*, mirrors the NRC panel's calculation, but starts with a distribution of spending by reference families on food, clothing, shelter plus utilities and moop. After calculating about 80 percent of median spending on this expanded "basic bundle" of food, clothing, shelter plus utilities, and moop (FCSUM), a multiplier to add "a little more" and family equivalence scales are applied.

The moopitt option employs an equivalence scale suggested by the panel to adjust the non-medical portion of the reference family threshold.[5] The panel was clear that its proposed equivalence scales did not reflect the medical needs of various types of families. Accordingly, the moopitt option employs a different equivalence scale to vary the portion of the poverty threshold associated with moop.

Analysis of Consumer Expenditure Survey data by BLS staff found that medical out-of-pocket expenditures represented about 7 percent of median spending on FCSUM by the NRC reference family type. The moopitt thresholds employed here adjust the moop portion of the reference family's threshold using an equivalence scale based upon ratios of median spending on moop by families of different size, number of members aged 65 and older, and health insurance status. These ratios were calculated using the experimental Census dataset povpu97.sd2, which includes estimates of moop for each family in the March 1998 CPS. An adjustment was made to compensate for the possibility that families with no health insurance may under-utilize health services because they cannot afford necessary care. A detailed presentation of the method, and the results are provided in an appendix.

In sum, here is the calculation of the moopitt variation of the NRC threshold for 1997:[6]

- $18,519 = median FCSUM for reference families.
- 7% = proportion of median represented by moop.
- non-medical part of the moopitt threshold = median FCSUM * .805 * .93 * 1.2 * NRC equivalence scale.
- moop part of the moopitt threshold = median FCSUM * .805 * .07 * moop equivalence scale.
- moopitt threshold = non-medical part + moop part.

The 1.2 multiplier proposed by the NRC panel to allow "a little more" for necessities other than food, clothing, and shelter plus utilities is applied only to the non-moop portion of the moopitt threshold.

Just as the panel's threshold does not assume any "spending pattern" among food, clothing, and shelter plus utilities, the moopitt option assumes no particular allocation of this threshold amount among food, clothing, shelter plus utilities, and out-of-pocket medical needs. Of course, given the variability of medical needs, some families will need less than the amount included for moop, and some will need more. Those who need more will spend current income that would otherwise be spent on food, clothing, and shelter, as the panel assumed, or will reduce their net wealth by liquidating assets or increasing debt, or will forego necessary medical services. The moopitt variation will not classify families as poor because they have unusually high medical spending for families of their type. Whether this is a decisive fault in comparison with the panel's recommended approach must be weighed against: a) the theoretical and practical difficulties with the panel's proposal mentioned at the start, which bear upon the question of whether we can measure necessary health expenditures that reduce current income below a poverty threshold amount for food, clothing, and shelter; b) whether relevant variation in medical needs is actually so much greater than variation in other needs, particularly shelter needs, that moop is too variable to include in a poverty budget.[7]

**Option 2: Add median moop to 80 percent of median spending on other needs**

A proposal that median amounts for moop be added directly to the NRC FCSU thresholds has attracted attention, as well. Reference families would be distributed by their medical out-of-pocket spending, and the median amount would be identified. That amount would then be added to the NRC FCSU-based threshold. To vary the thresholds by family composition, a method like the one described for Option 1 could be employed. Because the moop equivalence scale used in Option 1 reflects the ratio of median moop for families of various sizes and health insurance categories to the reference family median, Option 2 amounts to adding to each family's NRC threshold the median amount for moop of families of that type.

Because Option 2 takes a moop amount from one distribution (median spending on moop) and grafts it onto the NRC threshold based on another distribution (80 percent of median FCSU), I'll call this the moop-onto-the-threshold variation, or *moopott*. The formula for the reference family threshold is:

- non-medical part of the moopott threshold = NRC threshold
- moop part of the moopott threshold = median of distribution of spending on moop.
- moopott threshold = non-medical part + moop part.

Reference family threshold levels are similar under both options, although moop represents a larger share under Option 2. In the distribution underlying Option 1, the median reference family spends $18,519 on food, clothing, shelter plus utilities, and moop. About 7 percent of this amount, or $1,296, is moop. When the 7 percent is applied to about 80 percent of the median FCSUM, the resulting implicit moop amount in the reference family's threshold is $1,044 dollars. The amount for food, clothing, and shelter plus utilities plus a little more, is $16,637. The total moopitt reference family threshold is $17,681.

Option 2 starts with a distribution of reference families by the amount spent on moop. The median is $1,767. That amount is added to a 1997 NRC reference family threshold of $15,998 for a total of $17,764.

Option 2 assumes that reference families need income equal to 80 percent of median spending for food, clothing, and shelter plus utilities, but 100 percent of median for medical out-of-pocket spending. The argument might be that, while we think a sub-average level of consumption of food, clothing, and shelter is appropriate for a poverty measure, a sub-average level of health care is not.

**Official and NRC poverty rates**

Table 1 below presents a display that will be used throughout. The columns reflect the experience of the noninstitutional population as a whole, and of age, labor force, and racial subgroups of interest. The rows reflect the distribution of the population groups when family incomes (the definition of income changes with the tables, but the definition of family is always the same) are divided by the subject poverty thresholds. When the result is less than one, the family is classified as poor by that measure. Because the alternative poverty measures have interesting effects on the rates at which people are classified as extremely poor or near poor, the standard display presents the share of persons at several fractions and multiples of the poverty level as well. The 1.3 level was chosen because it corresponds to income eligibility levels of some means-tested programs.

Table 1 displays the rates at which persons in various subgroups have family incomes that fall within fractions and multiples of their official poverty thresholds. The NRC report criticized the official poverty measure on many counts, including irregularities in the implicit equivalence scale, narrow income definition (all regular pre-tax money income), and low threshold level. A version of the new poverty measure proposed by the NRC panel to correct these deficiencies underlies the poverty rates displayed in Table 2.

Table 2 corresponds to the mid-range example of the NRC proposal presented in the initial Census experimental report, P60-205. That Census report termed this NRC option "NGA/U" (for No Geographic Adjustment, with the overall rate Unbenchmarked to the official rate).[8] The overall poverty rate is 2.5 percentage points, or 19 percent, higher.[9] The increase in the near poor, in this case those with incomes from 100 percent to 130 percent of poverty, is even greater. Among the subgroups, the largest increase is the 7.4 percentage point, or 70 percent, jump in the poverty rate of persons 65 and older. Note too that the NRC measure more than triples the share of the aged with incomes below half their poverty threshold.

**Option 1, moopitt poverty rates**

Table 3 presents the results of Option 1, or the moopitt variation, of the NRC measure. The overall poverty rate is half a percentage point higher than the official rate. The difference is the net effect of differences in the income definition (the NRC measure counts food and housing benefits, net capital gains, and the effects of direct taxes, but subtracts work expenses and necessary child care), differences in the level of the reference family's poverty threshold, differences in the underlying equivalence scales, and the remaining differences in items included in the poverty budget (the official thresholds implicitly include something for work expenses and child care). [10]

The largest difference between poverty rates on Tables 2 and 3 is among the aged. The moopitt poverty rate among the aged is 5.4 percentage points, or nearly one-third, lower than the NRC rate. The moopitt threshold includes about 80 percent of median moop spending. The NRC rate subtracts estimates of 100 percent of each family's moop from the family's resources before testing them against thresholds (which include nothing for moop).

For families with estimated spending below the moop median, moving from the NRC measure to the moopitt measure involves adding more to their thresholds (median moop) than is added to (or no longer subtracted from) their incomes. If the NRC income of these families happened to fall above their NRC threshold by less than the difference between their moop and median moop for their family type, switching from the NRC measure to the moopitt measure would push them below the moopitt poverty line.

Similarly, if a family's estimated moop was above the median for its type, moving from the NRC measure to the moopitt measure would add more to income than it added to its threshold. If these families were below the NRC poverty line by less than the difference between their own moop and median moop, switching from the NRC measure to the moopitt measure would raise them above the moopitt poverty line.

Among the aged in the Census 1997 experimental poverty dataset, median moop is $2,101. In other words, the maximum by which median moop can exceed a family's own moop is $2,101. In moving from Table 2 to Table 3, the amount by which an aged person's income exceeded the poverty threshold could not shrink by any more than that. About half of the aged below median moop would see their incomes shrink by less than $855 relative to their thresholds.

On the other hand, for 5 percent of all aged persons, their own estimated moop exceeds the median by more than $10,000. In moving from Table 2 to Table 3, at least 5 percent of the age would see at least a $10,000 increase in their income relative to their poverty threshold. About half of the aged above median moop would see their incomes increase by more than $1,826 relative to their thresholds.

The decline in the poverty rate of the aged from Table 2 to Table 3 also depends on the distribution of other family income, which determines how many are close enough to their poverty line to be affected by the different treatment of moop. Nevertheless, it is clear that moving from the NRC measure to the moopitt measure would increase average income among the aged relative to their poverty thresholds. Is that an improvement in the measure of poverty?

This brings us again back to the question of identifying and quantifying medical needs. If, after a family pays for necessary medical treatment, its remaining resources are insufficient to cover its needs for food, clothing, shelter plus utilities, and a little more, the NRC panel judged that we should classify this family as economically poor.

If we knew that all moop were necessary spending, and that current estimates of moop were accurate, and that our estimates of moop reduced current income available for food, clothing, shelter, and a little more dollar for dollar, then the NRC approach would clearly be a better measure. We would still face challenges about how to make it possible for surveys that don't focus on income to make poverty classifications, but the superiority of the NRC approach would not be in doubt.

However, we know that not all moop is necessary, that the modeling necessary to first add health insurance premium amounts to household spending in medical expenditure survey data and then assign amounts from this data source to households in income surveys requires very sophisticated techniques and considerable room for judgement,[11] and that some moop, especially moop that is high in relation to income and so likely to affect NRC poverty status is funded out of net wealth or otherwise not paid from current income.

**Option 2, moopott poverty rates**

Table 4 shows that the effects of Option 2 are similar to those of Option 1. As noted above, Option 2 adds more to the thresholds for moop than does Option 1. The effect is most visible in the column for the aged, who tend to have higher moop in relation to income, and in the column for persons in uninsured families. Option 2 raises the poverty rate of the aged by about one-third compared to the official rate, and 13 percent above Option 1, but this is still about one-fifth below the NRC level. Option 2's rate for persons in uninsured families is one-fourth higher than the official measure, and around one-sixth higher than the NRC and moopitt rates.

Except when it comes to the aged and the uninsured, the distributional effects of moopitt and moopott are very similar. We don't see results with one or the other option that would lead us to reject it as implausible on its face. The choice between them would seem to come down to whether better arguments can be advanced to show that the amount for moop in Option 1 must be too small or that Option 2's grafting of 100 percent of median moop on top of 80 percent of median food, clothing, and shelter is an inconsistent measure.

## Appendix

The calculation of poverty thresholds and rates including something for medical out-of-pocket expenditures employed only datasets available to the public. The SAS program used to generate the tables included in the body of the paper is attached at the end of this appendix. Two steps in that program, development of the moop equivalence scale and the treatment of the uninsured, require further explication.

**Moop equivalence scales**

The moop equivalence scale employed varies the moop amount in the reference family threshold by the ratio of median moop for the reference family type with all members covered by private insurance to medians for other family types by insurance status. The median amounts for each cell were read from the combined Census experimental files povpu97.sd2 and povpu98.sd2.

In a few cells, median moop for larger families appeared to be lower than for smaller families. This could occur due to sampling or estimation error, or perhaps due to relevant characteristics not taken into account by family size. In no case was the difference large, and no further adjustment was made. However, this illustrative moop equivalence scale could benefit from further research.

For a summary of the method used to develop the moop estimates for the experimental poverty dataset, see P60-205, C16-19.

**Adjustment for the uninsured**

An August 2, 2000 letter from poverty experts to the Director of the Office of Management and Budget and the Director of the Bureau of the Census proposed that , if amounts are included in new poverty thresholds for out-of-pocket medical spending, the amounts should reflect the special circumstances of families with no medical insurance. The moop equivalence scales described above vary the moop part of the thresholds based on actual out-of-pocket medical spending by families with various characteristics. If families without health insurance forego necessary medical care because they cannot afford it, then the ratio of actual median moop for the uninsured to the reference family's median may tend to underestimate the amount of moop that should be included in the uninsureds' moopitt thresholds. We know that the uninsured receive less medical care than the insured, although the extent to which they receive less necessary medical care is not known. Third-party

payment for medical care is known to increase utilization, but again, how much of the difference is necessary medical care is unknown.
The poverty experts recommended:

> For persons without health insurance coverage, medical care costs should be based on the cost of a standard, unsubsidized insurance package plus added out-of-pocket spending on medical services. In order to avoid imputing an estimate of out-of-pocket spending that includes expenditures for nonessential care, we recommend that estimates of out-of-pocket spending be based on expenditure patterns in similar families which have incomes between one-half and one times the national median income. Similarity should be based on family size, age of family head, region of residence, and health status.

The recommendation mentions both persons and families. Most uninsured persons in CPS reside with other family members who have some type of coverage. Adjustments for all possible combinations would be very complicated. As Table A-1 shows, families with some insured and some uninsured members have spending levels like families with all insured in the experimental dataset. For this reason and for practicality, the adjustments were made only to the moop of families in which all members were uninsured.
Our best source of medical expenditure data, the Medical Expenditure Panel Survey, included around 14,000 households for 1997. This sample is probably insufficient for the five dimensions of variation the experts recommended. In any case, the Census experimental datasets did not vary estimates of moop based on health status or region, and the adjustments to moop amounts described here did not either.
The "cost of a standard, unsubsidized insurance package" is to represent what a family would pay to purchase health insurance coverage on its own. From discussions at a series of meetings hosted by the Brookings Institution and the Institute for Research on Poverty, it appears that the intent is to use as a proxy for the medical out-of-pocket needs of the uninsured the sum of the insurance premiums and other moop of similar privately insured families, plus the employer's contribution to the premiums. In the adjustments below, total medical expenditures for insured families were employed.
If third party subsidy of health care costs tends to increase utilization beyond what is necessary, or if some uninsured families "self-insure" because they believe themselves to be less at risk, the suggested adjustment to the moop of the uninsured would be too high. Typical medical expenditures by uninsured families are lower than those of privately insured families, even at income levels high enough that the uninsured would not seem to be cost-constrained. Uninsured families with no aged members and incomes greater than $30,000 were selected from Medical Expenditure Panel Survey data, and their total health care spending was calculated. Medians and means by family size were compared to medians of similar families covered by private health insurance.
Even in income ranges where it appears that median spending amounts would not pose an unusual burden, expenditures by and in behalf of uninsured families are significantly lower than expenditures by and in behalf of privately insured families.
Notwithstanding, the adjustments for the moop of the uninsured used in this paper followed the experts' suggestion. MEPS total medical expenditure amounts for families with no aged members and all members covered by private insurance were employed by family size.
The experts are understood here to suggest that privately insured families of each size, age of head, region, and health status first be ordered by total income. Then total medical expenditures by families with incomes from half the median to median income would be identified. The experts' letter does not specify whether the median or mean of such expenditures would be used as a proxy for the needs of the uninsured. This choice is not very significant for Option 1, in which the adjustment only modifies the ratio by which 6 percent of the reference family's moopitt threshold is multiplied to determine the moopitt threshold of the uninsured. However, the difference for Option 2 is significant, particularly for the uninsured.
The experts suggest that expenditures by families a little below the median be used because such expenditures are less likely than expenditures of families with higher incomes to include amounts for "nonessential care." Like the NRC panel's assumption that all moop among families with low incomes is for essential care, this one is sensible but unsupported by empirical evidence.
If we suppose that all medical spending by and in behalf of privately insured families a little below median income is necessary and would reduce the current income of the uninsured available for food, clothing, and shelter, then mean expenditures might be the appropriate proxy for uninsured families. So the question of mean or median parallels the issue that was a motive for developing a moopitt threshold in the first place.
Compared to medians, means are more influenced by extremes of a distribution. In Table A-2b, even with zero amounts for some families of each size, mean amounts are twice as large as medians. So the choice between adjusting the thresholds of the uninsured by the mean or medians of medical expenditures by or for families with incomes a little below the median is between whether we want the adjustment to be influenced by the extremely high medical expenditures of the tail of the distribution.

Both the moopitt and moopott options presented in this paper reflect recognition that it may be impractical for a general poverty measure to include a family-by-family test of the extent to which necessary medical out-of-pocket spending reduces measured resources available for food, clothing, shelter plus utilities, and a little more. Instead, these thresholds include typical amounts for moop, based on around four-fifths of median spending for moopitt and around median spending for moopott. If adopted, they would have to be presented with qualifications, like the current poverty measure and the NRC proposal. It would be important to acknowledge that some families classified as not poor might have actual medical expenses that leave them with resources below levels thought necessary for other needs. Similarly, with both moopitt and the NRC measure, it would be important to acknowledge that due to variation in the supply and price of housing in particular localities, some families may have actual necessary shelter costs that leave them with resources below levels thought necessary for other needs. In each case, we would acknowledge that our poverty threshold reflects typical amounts thought necessary for food, clothing, shelter plus utilities, medical out-of-pocket spending, and a little more. We would acknowledge that the situations of individual families always vary from the typical, and that it is appropriate in the rules of our means-tested assistance programs to accommodate the circumstances of individual families in a way it is not practical to accommodate them in our statistical measure of poverty.

Table 3 in the text adjusts the moop of uninsured families based upon the medians of similar privately insured families with incomes from half the median to the median for each family type. Table A-3. reflects the same moopitt thresholds except that the amount for moop in the thresholds of uninsured families reflects the means for similar privately insured families with incomes from half the median to the median. However, the differences in poverty rates between Tables 3 and A-3 are all less than one percent because the medians or means are employed only in ratios to vary the same reference family amount for moop, .07 * .805 * 18,519.

Table A-4 duplicates Table 4 in the text, except that the amount for moop in the thresholds of uninsured families reflects the means for similar privately insured families with incomes from half the median to the median. With the moopott threshold computation, that amounts to assigning the full mean amounts to the NRC thresholds of the uninsured. The poverty rate for persons in uninsured families is more than four percentage points higher on Table A-4 than on Table 4.

The amount to include in moopitt thresholds of the uninsured is bound to remain a subject of future research and controversy. The low level of medical expenditures by the uninsured who do not have low-incomes suggests that the low level of expenditures by uninsured low-income families is probably not due entirely to cost constraints. Nevertheless, the experts' suggestion for adjusting the moop of the uninsured was employed here for both moopitt and moopott poverty rates. In the text tables, medians of privately insured families a little below median income were used to adjust the moop amounts in thresholds of the uninsured. In appendix tables, the results of using means of the medical expenditures of privately insured families were presented for comparison. Medians, which reflect a typical experience, were chosen for the text tables on the grounds that the decision to include something for moop in NRC-like thresholds itself reflects recognition that it may not be practical for a general poverty measure to be sensitive to the circumstances of individual families with unusually high or low medical out-of-pocket spending. Moreover, while means are more sensitive than medians to distributional extremes, adding mean medical expenditure amounts to poverty thresholds does not capture variation of medical need within groups any better than adding median amounts.

**Program that produced the text tables**

```
NOTE: Copyright (c) 1999 by SAS Institute Inc., Cary, NC, USA.
NOTE: SAS (r) Proprietary Software Version 8 (TS M0)
Licensed to OFFICE OF MANAGEMENT & BUDGET
NOTE: This session is executing on the WIN_NT platform.
NOTE: SAS initialization used:
real time 1.05 seconds
cpu time 1.01 seconds
1 * altmoop.sas;
2
3 libname expov 'd:\expov\datasets';
NOTE: Libref EXPOV was successfully assigned as follows:
Engine: V6
Physical Name: d:\expov\datasets
4
5 data one;
6 set expov.povpu97 (keep=combexp moop fpersons geo1 marsupwt
7 h_seq pf_seq ppposold race rac_hisp scalepm severe nl1 nl2 nl5 nl6
8 npoor1 npoor2 fpovcut def017 ftotval housub f_mv_fs f_mv_sl
9 fengval ffedtax feitc ffica fsttax fcapgain fcaploss hea agecat
10 famhead pov_univ adwk);
```

```
11
12 * identify families;
13 famid=h_seq+(pf_seq/100);
14
15 if race=2 then black=marsupwt;
16 if agecat=1 then kid=marsupwt;
17 if agecat=3 then aged=marsupwt;
18 if agecat=3 then old=1;
19
20 if pov_univ=1 then output;
21
NOTE: Character values have been converted to numeric values at the places given by:
(Line):(Column).
20:4
NOTE: There were 131617 observations read from the dataset EXPOV.POVPU97.
NOTE: The data set WORK.ONE has 131293 observations and 41 variables.
NOTE: DATA statement used:
real time 11.67 seconds
cpu time 2.42 seconds
22 proc sort;
23 by famid ppposold;
24
NOTE: There were 131293 observations read from the dataset WORK.ONE.
NOTE: The data set WORK.ONE has 131293 observations and 41 variables.
NOTE: PROCEDURE SORT used:
real time 14.80 seconds
cpu time 3.47 seconds
25 data two;
26 infile 'e:mar98pub.cps' recfm=f lrecl=854 obs=253044;
27
28 input @1 rectype 1.@;
29 if rectype=3 then input
30 @2 h_seq 5. @7 pppos 2. @15 age 2. @46 pf_seq 2.
31 @110 ppposold 2. @448 pearnval 8.
32 @469 mcare 1. @470 mcaid 1. @471 champ 1. @472 hi_yn 1.
33 @484 cov_gh 1. @485 cov_hi 1 @486 ch_mc 1. @487 ch_hi 1.;
34 else delete;
35
36 * identify families;
37 famid=h_seq+(pf_seq/100);
38
39 if mcare ne 1 and mcaid ne 1 and champ ne 1 and hi_yn ne 1
40 and cov_gh ne 1 and cov_hi ne 1 and ch_mc ne 1 and ch_hi ne 1
41 and ch_hi ne 2 then unin=1;
42
43 if hi_yn=1 or cov_gh=1 or cov_hi=1 then privin=1;
44 if mcare=1 or mcaid=1 or champ=1 or ch_mc=1 then pubin=1;
45
NOTE: The infile 'e:mar98pub.cps' is:
File Name=E:\mar98pub.cps,
RECFM=F,LRECL=854
NOTE: 253044 records were read from the infile 'e:mar98pub.cps'.
NOTE: The data set WORK.TWO has 131617 observations and 19 variables.
NOTE: DATA statement used:
real time 1:16.66
cpu time 4.25 seconds
46 proc sort;
47 by famid ppposold;
48
NOTE: There were 131617 observations read from the dataset WORK.TWO.
```

NOTE: The data set WORK.TWO has 131617 observations and 19 variables.
NOTE: PROCEDURE SORT used:
real time 8.62 seconds
cpu time 2.12 seconds
49 data three;
50 merge one (in=inone) two;
51 by famid ppposold;
52 if inone;
53
NOTE: There were 131293 observations read from the dataset WORK.ONE.
NOTE: There were 131617 observations read from the dataset WORK.TWO.
NOTE: The data set WORK.THREE has 131293 observations and 56 variables.
NOTE: DATA statement used:
real time 25.89 seconds
cpu time 2.90 seconds
54 proc sort;
55 by famid famhead;
56
NOTE: There were 131293 observations read from the dataset WORK.THREE.
NOTE: The data set WORK.THREE has 131293 observations and 56 variables.
NOTE: PROCEDURE SORT used:
real time 50.92 seconds
cpu time 4.47 seconds
57 data four;
58 set three;
59 by famid famhead;
60
61 if first.famid then pers=0;
62 pers+marsupwt;
63 if first.famid then ageds=0;
64 ageds+aged;
65 if first.famid then oldies=0;
66 oldies+old;
67 if first.famid then kids=0;
68 kids+kid;
69 if first.famid then blacks=0;
70 blacks+black;
71 if first.famid then privins=0;
72 privins+privin;
73 if first.famid then pubins=0;
74 pubins+pubin;
75 if first.famid then unins=0;
76 unins+unin;
77 if first.famid then fearnval=0;
78 fearnval+pearnval;
79 if last.famid and marsupwt gt 0 then output;
80
NOTE: There were 131293 observations read from the dataset WORK.THREE.
NOTE: The data set WORK.FOUR has 55029 observations and 65 variables.
NOTE: DATA statement used:
real time 4.79 seconds
cpu time 1.72 seconds
81 data five;
82 set four;
83
84 if oldies gt 2 then oldies=3;
85 if fpersons gt 4 then fpersons=5;
86
87 if unins=fpersons then unpers=pers;
88

```
89 * median moop in povpu97.sd2 for non-aged family heads;
90 medimoop=1045;
91 moopscal=1045/1767;
92
93 if oldies=0 and privins=fpersons then do;
94 if fpersons=1 then moopscal=.4;
95 if fpersons=2 then moopscal=1;
96 if fpersons=3 then moopscal=1;
97 if fpersons=4 then moopscal=1.2;
98 if fpersons gt 4 then moopscal=1.1;
99 end;
100
101 if oldies=0 and pubins=fpersons then do;
102 if fpersons=1 then moopscal=.1;
103 if fpersons=2 then moopscal=.3;
104 if fpersons=3 then moopscal=.2;
105 if fpersons=4 then moopscal=.4;
106 if fpersons gt 4 then moopscal=.4;
107 end;
108
109 * 2 approaches to August 2 letter method for adjusting for uninsured;
110 * means for MEPS 1996 total medical expenditures for privately
111 insured families with half to median total expenditures
112 divided by reference family median moop;
113 if oldies=0 and unins=fpersons then do;
114 if fpersons=1 then moopscal=515/1767;
115 if fpersons=2 then moopscal=1946/1767;
116 if fpersons=3 then moopscal=2073/1767;
117 if fpersons=4 then moopscal=2659/1767;
118 end;
119
120 * means for MEPS 1996 total medical expenditures for privately
121 insured families with half to median family income
122 divided by reference family median moop;
123 if oldies=0 and unins=fpersons then do;
124 if fpersons=1 then exscal=1902/1767;
125 if fpersons=2 then exscal=3600/1767;
126 if fpersons=3 then exscal=4865/1767;
127 if fpersons=4 then exscal=5535/1767;
128 end;
129
130 if oldies=0 and privins gt 0 and unins gt 0 then do;
131 if fpersons=2 then moopscal=.9;
132 if fpersons=3 then moopscal=.8;
133 if fpersons=4 then moopscal=1.1;
134 if fpersons gt 4 then moopscal=1.2;
135 end;
136
137 if oldies=0 and pubins gt 0 and unins gt 0 then do;
138 if fpersons=2 then moopscal=.1;
139 if fpersons=3 then moopscal=.2;
140 if fpersons=4 then moopscal=.4;
141 if fpersons gt 4 then moopscal=.4;
142 end;
143
144 if oldies=1 then moopscal=.9;
145 if oldies=2 then moopscal=1.5;
146 if oldies ge 3 then moopscal=1.5;
147
148 * Option 1, method developed for first report with Aug 2
```

```
149 adjustment for uninsured;
150
151 fcsum=18519;
152 refmoop=.07;
153
154 fcsupart=fcsum*.805*(1-refmoop)*1.2*scalepm;
155 moopart=fcsum*.805*refmoop*moopscal;
156
157 moopitt=fcsupart+moopart;
158 * moopitt=moopitt*geo1;
159
160 moopinc=def017+moop;
161
162 moopafi=moopinc/moopitt;
163
164 if moopafi lt .5 then moopgrp=1;
165 if moopafi ge .5 and moopafi lt 1 then moopgrp=2;
166 if moopafi ge 1 and moopafi lt 1.3 then moopgrp=3;
167 if moopafi ge 1.3 and moopafi lt 2 then moopgrp=4;
168 if moopafi ge 2 and moopafi lt 3 then moopgrp=5;
169 if moopafi ge 3 then moopgrp=6;
170
171 * Option 1a, method developed for first report with large Aug 2
172 adjustment for uninsured;
173
174 if exscal ne . then expart=fcsum*.805*refmoop*exscal;
175 else expart=moopart;
176
177 exprts=fcsupart+expart;
178 * exprts=exprts*geo1;
179
180 exprtafi=moopinc/exprts;
181
182 if exprtafi lt .5 then exprtgrp=1;
183 if exprtafi ge .5 and exprtafi lt 1 then exprtgrp=2;
184 if exprtafi ge 1 and exprtafi lt 1.3 then exprtgrp=3;
185 if exprtafi ge 1.3 and exprtafi lt 2 then exprtgrp=4;
186 if exprtafi ge 2 and exprtafi lt 3 then exprtgrp=5;
187 if exprtafi ge 3 then exprtgrp=6;
188
189 * NRC mid-range in first report;
190
191 nasafi=(def017)/nl6;
192
193 if nasafi lt .5 then nasgrp=1;
194 if nasafi ge .5 and nasafi lt 1 then nasgrp=2;
195 if nasafi ge 1 and nasafi lt 1.3 then nasgrp=3;
196 if nasafi ge 1.3 and nasafi lt 2 then nasgrp=4;
197 if nasafi ge 2 and nasafi lt 3 then nasgrp=5;
198 if nasafi ge 3 then nasgrp=6;
199
200 * official measure;
201
202 afi=ftotval/fpovcut;
203
204 if afi lt .5 then afigrp=1;
205 if afi ge .5 and afi lt 1 then afigrp=2;
206 if afi ge 1 and afi lt 1.3 then afigrp=3;
207 if afi ge 1.3 and afi lt 2 then afigrp=4;
208 if afi ge 2 and afi lt 3 then afigrp=5;
```

```
209 if afi ge 3 then afigrp=6;
210
211
212 * Option 2, add median moop amounts to NRC thresholds
213 with small adjustment for uninsured;
214
215 moopon=1767*moopscal;
216
217 shrt2afi=(def017+moop)/(nl6+moopon);
218
219 if shrt2afi lt .5 then shrt2grp=1;
220 if shrt2afi ge .5 and shrt2afi lt 1 then shrt2grp=2;
221 if shrt2afi ge 1 and shrt2afi lt 1.3 then shrt2grp=3;
222 if shrt2afi ge 1.3 and shrt2afi lt 2 then shrt2grp=4;
223 if shrt2afi ge 2 and shrt2afi lt 3 then shrt2grp=5;
224 if shrt2afi ge 3 then shrt2grp=6;
225
226 * Option 2a, add median moop amounts to NRC thresholds
227 with large adjustment for uninsured;
228
229 if exscal ne . then lrgmoop=1767*exscal;
230 else lrgmoop=moopon;
231
232 shrt3afi=(def017+moop)/(nl6+lrgmoop);
233
234 if shrt3afi lt .5 then shrt3grp=1;
235 if shrt3afi ge .5 and shrt3afi lt 1 then shrt3grp=2;
236 if shrt3afi ge 1 and shrt3afi lt 1.3 then shrt3grp=3;
237 if shrt3afi ge 1.3 and shrt3afi lt 2 then shrt3grp=4;
238 if shrt3afi ge 2 and shrt3afi lt 3 then shrt3grp=5;
239 if shrt3afi ge 3 then shrt3grp=6;
240
241 fams=1;
242 pers=pers/marsupwt;
243 kids=kids/marsupwt;
244 ageds=ageds/marsupwt;
245 blacks=blacks/marsupwt;
246 unpers=unpers/marsupwt;
247
248 if adwk=1 then inwrkfam=pers;
249 * if fearnval gt 0 then inwrkfam=pers;
250
NOTE: Missing values were generated as a result of performing an operation on missing values.
Each place is given by: (Number of times) at (Line):(Column).
48682 at 246:14
NOTE: There were 55029 observations read from the dataset WORK.FOUR.
NOTE: The data set WORK.FIVE has 55029 observations and 93 variables.
NOTE: DATA statement used:
real time 5.55 seconds
cpu time 1.60 seconds
251 proc tabulate;
252 class afigrp moopgrp exprtgrp nasgrp shrt2grp shrt3grp;
253 var fams pers kids ageds blacks inwrkfam unpers;
254 weight marsupwt;
255
256 table all afigrp, inwrkfam pers kids ageds blacks unpers;
257
258 table all nasgrp, inwrkfam pers kids ageds blacks unpers;
259
260 table all moopgrp, inwrkfam pers kids ageds blacks unpers;
```

261
262 table all exprtgrp, inwrkfam pers kids ageds blacks unpers;
263
264 table all shrt2grp, inwrkfam pers kids ageds blacks unpers;
265
266 table all shrt3grp, inwrkfam pers kids ageds blacks unpers;
267
268 run;
NOTE: There were 55029 observations read from the dataset WORK.FIVE.
NOTE: PROCEDURE TABULATE used:
real time 3.18 seconds
cpu time 1.67 seconds

[1] Constance F. Citro, and Robert T. Michael (eds.), (1995) Measuring Poverty: A New Approach, (National Academy Press, Washington DC).

[2] These may be found, along with the datasets used to produce them, at https://www.census.gov/hhes/www/povmeas.html

[3] Kathleen Short, Thesia Garner, David Johnson, and Patricia Doyle, (1999) Experimental Poverty Measures: 1990 to 1997, U.S. Bureau of the Census, Current Population Reports, Consumer Income, P60-205, (U.S. Government Printing Office, Washington, DC).

[4] P60-205, C-1.

[5] For the poverty estimates presented below, the variable SCALEPM from the Census experimental dataset povpu97.sd2 was used.

[6] The values from the Consumer Expenditure Survey were developed by Thesia Garner of the Bureau of Labor Statistics.

[7] This issue is explored in Richard Bavier, "Variation in need for shelter and medical out-of-pocket spending," paper presented at the Joint Statistical Meetings, August 1999.

[8] Compare Table 2 to the NGA/U column of Table B2a. in P60-205. The Census report includes estimates of the effects of realized capital gains in the NRC resource measure, although capital gains were not included in the NRC resource definition. Poverty estimates that reflect the effects of federal income taxes paid, including taxes on capital gains, but did not count the capital gains income on which the tax was paid, would be inconsistent.

[9] In presenting its report, the NRC panel cited the handling of medical needs as the largest factor in the increase. However, it appears that the higher level chosen for the reference family threshold has a much larger effect. See, Richard Bavier, "Three False Steps," https://www.census.gov/hhes/www/povmeas/papers.html.

[10] The original official thresholds were set at three times the level of an economy food plan. Initially indexed to the price of food, since the late 1960s, the official thresholds have been indexed by the CPI-U for all items. The market-basket quantities that weight the CPI-U item prices include expenditures for transportation to work, tools and work clothes, and child care. However, for families that actually have such expenses, the share that these expenses represent of their own expenditures is no doubt greater than their weight in the CPI-U for all items.

[11] See P60-205, C16-19.