

1990 RESURVEY OF MATURE MEN

APPENDIX 27: Procedures for Calculating the 1990 Weights
R6013.10., R6013.20., R7113.10.-R7113.30.

**Procedure for Calculating the 1990 Weights
for the Resurvey of NLS Older Males**

Of the original sample of 5,020 men representing the **civilian noninstitutionalized population of males age 45-59 in 1966**, the 1990 re-survey of the NLS sample of older men has yielded interviews with 2,092 surviving men, with 1,341 widows of decedents, and, in the absence of a living widow, with 865 other next-of-kin of the decedents--86 percent of the original number of cases. The purpose of this paper is to think through the problems of assigning appropriate weights to the 1990 sample and to describe the method that has been used. The first three sections describe and evaluate the weighting procedure that has been used in the past; the last section, beginning on p. 4, discusses the issues relating to the 1990 weights and describes the procedure that has been used.

Original Sample Design

The cohort of men between the ages of 45 and 59 in the 1966 civilian noninstitutionalized population was represented by a multi-stage probability sample located in 235 sample areas comprising 485 counties and independent cities representing every state and the District of Columbia. The sample was drawn by the Bureau of the Census from the primary sampling units (PSUs) that had been selected for the experimental Monthly Labor Survey conducted between early 1964 and late 1966. These areas were selected by grouping all of the nation's counties and independent cities into about 1,900 primary sampling units (PSUs) and then forming 235 strata of one or more PSUs that were relatively homogeneous according to socioeconomic characteristics. A single PSU was selected to represent each stratum, and within each PSU a probability sample of housing units was selected to represent the civilian noninstitutionalized population.

Because one of the survey requirements was to provide separate reliable statistics for blacks, **households in predominantly black enumeration districts (EDs) were selected at a rate approximately three to four times that for households in predominantly white Eds.** The sample was designed to provide approximately 5,000 respondents--about 1,500 blacks and 3,500 whites.

An initial sample of about 42,000 housing units was selected, and a screening interview was conducted in March and April, 1966. Somewhat over 35,000 housing units were found to be available for interview, of which usable information was obtained for 34,662 households--a completion rate of 98 percent. As the result of the screening operation, 5,518 males age 45 to 59 were designated to be interviewed. These had been sampled differentially within four strata: whites in white EDs (i.e., EDs containing predominantly white households), blacks in white EDs, whites in black EDs, and blacks in black EDs.

Base Year Sampling Weights

The first step in developing the sampling weights for 1966 was to assign each sample case a basic weight consisting of the reciprocal of the final probability of selection, reflecting the differential sampling by race within each stratum. Some members of the original sample could not be interviewed in the 1966 survey because of absence, refusal, or unavailability for other reasons; the number of men actually interviewed was 5,020.

The initial sample-based weights for those interviewed were accordingly adjusted to the extent necessary to account for the individuals who were not interviewed. This adjustment was made separately for each of eight groupings, based on the four Census regions (Northeast, North Central, South, West) by urban-rural residence.

The composition of a sample obtained in the manner described above may differ somewhat, by chance, from that of the population as a whole with respect to residence, age, and race. Since these population characteristics are closely correlated with the principal measurements that were to be made from the sample, the sample cases were weighted appropriately to conform to the known distribution of these population characteristics. This weighting was accomplished in the initial survey through two stages of ratio estimation.

The first stage took into account differences at the time of the 1960 Census between the distribution by race and residence of the population as estimated from the sample PSUs and that of the total population in each of the four major regions of the country. Using 1960 Census data, estimated population totals by race and residence for each region were computed by appropriately weighting the Census counts for PSUs in the sample. Ratios were then computed between these estimates (based on sample PSUs) and the actual population totals for the region as shown by the 1960 Census.

In the second stage, the sample proportions were adjusted to independent current (1966) estimates of the civilian noninstitutionalized population by age, sex, and race. These estimates were prepared by carrying forward the most recent Census data (1960) to take account of subsequent aging of the population, mortality, and migration between the United States and other countries. The adjustment was made by race within the three five-year age groups represented by the sample.

Sampling Weight Adjustments for Attrition

Subsequent to the initial interview of each cohort, reductions in sample size have occurred due to noninterviews. In order to compensate for these losses, the sampling weights of the individuals who were interviewed had to be revised. In each survey year, this revision was done in two stages. First, "out-of-scope" noninterviews were identified by the Bureau of the Census and eliminated from the sample of noninterviews. This group consisted of individuals who were institutionalized, who had died, who were members of the Armed Services, or who had moved outside the United States--i.e., individuals who were no longer members of the noninstitutionalized civilian population of the United States.

The second stage in the adjustment made in each survey year acknowledged the nonrepresentative characteristics of the in-scope noninterviews. Those who were eligible but not interviewed, as well as those who were interviewed, were distributed into strata (cells) according to their race, years of school completed, and years in place of residence at the first interview (1966). Within each of the cells, the base year sampling weights of those interviewed were increased by a factor equal to the reciprocal of the reinterview rate (using base year weights) in that survey year.

Base year (1966) weights for whites ranged between 3,115 and 16,651, with a mean of 3,859 and those for blacks ranged from 641 to 2,854, with a mean of 916. By 1983, the mean weights after adjustment for attrition according to these procedures had risen to 5,165 for whites and 1,118 for blacks.

Evaluation of the Process of Reweighting for Attrition

A degree of confidence in the procedure that has been

used in each survey year to reweight the members of the 1966 sample is provided by a comparison between measures obtained from the 1/1000 Sample of the 1980 Census of Population and corresponding (weighted) measures from the 1980 and 1981 NLS surveys (Table 1).

Overall, the estimates of the population of males aged 69 to 73 in 1980 yielded by these two sources differed by less than 2 percent (Census = 11,864,000; NLS = 12,081,000). Racial composition and the composition by age among both whites and blacks are virtually identical. By highest year of school completed, the distributions of the total samples are also very similar, although when the two racial groups are disaggregated the NLS distribution indicates a somewhat lower level of attainment for black men than the Census data. The two sources also produce remarkably similar distributions by marital status, although, again, there are somewhat greater differences in the case of the blacks.

Economic measures yielded by the two data sources are also quite similar, although not quite so close as the demographic measures just described. Labor force status in the week preceding the survey showed about three-fifths of the men (Census = 57%; NLS = 61%) to be neither working nor looking for work. About one-half of the men (Census = 49%; NLS = 50%) had not worked in the preceding year, but almost one-third had worked at least 50 weeks (Census = 33%; NLS = 34%). Wage and salary income of at least \$15,000 was earned by 19 percent of the men according to the Census figures and by 17 percent according to NLS. Total family income distributions were somewhat less similar: about one-fifth of the men (Census = 19%; NLS = 21%) had annual incomes under \$5,000, but the proportion of men reporting incomes of \$25,000 or higher was 26% in the Census and 19% in the NLS. This difference, however, may result from the nature of the adjustment used to compensate for the fact that the Census data related to calendar 1979 whereas the NLS data related to 1980. (See footnote #, Table 1).

Weighting the 1990 Sample

Surviving Men From the foregoing description, it is clear that even if all of the surviving members of the original sample were to have been interviewed in 1990, they could not be assumed to constitute a representative sample of the U. S. civilian population of males 69-83 years of age in that year. The reasons are (1) that no adjustments to the 1966 sample have been made to reflect immigration into the United States or movement from armed service to civilian life between 1966 and 1990 and (2) that whereas members of the original sample who resided in institutions in 1990 are included in the sample, the original sample did not include

men who were then institutionalized.

These differences, while theoretically important, are not likely to affect significantly most types of analysis of the 1990 sample of men, because the proportions of the 1966 male population 45-59 years of age who were "defined" out of the universe represented by the sample were quite small. According to figures obtained from the 1970 Census of Population, the proportion of men 45 to 59 years of age (in 1970) who resided in institutions was only 1.02 percent, and those in the military service comprised less than one-half of one percent (.004%). We have no estimate of the number of persons who migrated into (or re-entered) the United States between 1966 and 1990, but the numbers in this age group of males is unlikely to be large. In sum, if we ignore for a moment the problem of attrition from the sample for reasons other than death, the 1990 sample of surviving men may be viewed for most purposes as adequately representing the 1990 population of males 69-83 years of age--with just one additional minor caveat: since the 1990 interview was conducted 4-5 months later than the earlier ones, some of the men will have achieved age 84.

So far as the male members of the original sample are concerned, the process of assigning 1990 weights is conceptually no different from the weighting scheme that has been used in each of the prior years--with one exception. That is, in all prior years institutionalized men have been regarded as "out of scope" and not interviewed, whereas in 1990 those residing in institutions ($n=61$) were eligible for interview and have therefore been treated in the same way as men residing at home.

Widows Where a study is to be made of the labor market experience or economic characteristics of widows in their own right, no readily available weights are appropriate. This is because the widows do not constitute a representative sample of any subset of widows in the population that can be defined in demographically meaningful terms. The best that can be said is that the widows constitute a representative sample of women who in 1966 were married to civilian, noninstitutionalized men aged 45 to 59 (or who between 1966 and 1990 married someone in that group) and whose husband died prior to 1990 (irrespective of whether the woman remarried)!

If the data in fact remain unweighted, users must be warned against attempting to make population estimates and also against using the data for deriving descriptive statistics unless the sample is stratified by race, since blacks have been substantially oversampled relative to

whites. For purposes of multivariate analysis, many researchers in the past have used unweighted data, and for those who have found this theoretically desirable, there is no reason why the widows' data cannot be used in the same way, provided it is recognized that the sample does not purport to be representative of any age group of widows in 1990 (or any other year).

Some researchers may wish to make generalizations in guarded terms about widows in their sixties and seventies--e.g., to present a statistic purporting to show the proportion of the total with incomes under \$10,000 in 1989. To serve such purposes we have generated a weight for each widow identical to that which would have been assigned to her husband had he been alive and interviewed in 1990.

The steps involved in deriving such weights for the widows interviewed in 1990 are as follows:

1. For each deceased member of the original sample of men who were married at any time between 1966 and time of death, we have identified his (most recent) wife.
2. We have eliminated as "out of scope" those widows who died or left the United States prior to time of interview in 1990.
3. To each remaining woman, the base year (1966) weight of her husband was assigned.
4. Both the women who have been interviewed and those who have not (for reasons other than death or emigration) were distributed into the same strata into which their husbands would have fallen had they been alive (by race, years of school completed, and years in place of residence in 1966 [see section on "Weight Adjustment for Attrition," above]).
5. Within each cell the base year weight of each woman who has been interviewed has been multiplied by the reciprocal of the reinterview rate for women in that cell.

Decedent men In the absence of a living widow, an attempt was made to obtain information about the deceased member of the original sample from a "proxy"--some other individual (most frequently a son or daughter). In order to develop weights for use in studies of decedent members of the original sample for whom 1990 information was obtained, we have combined these proxies with the widows and have created a set of weights in exactly the same manner as those

for the "in-scope" widows, i.e., by implementing steps 3-5, above for the combined group.

Total 1966 sample In order to permit investigations of the 1990 status of the original members of the sample of men we have created a "total weight" for 1990. This has been done by combining the three groups from whom 1990 information was obtained (surviving men, widows, and proxies) and subjecting this group the procedure described above.

Using the 1990 Weights

Researchers will doubtless wish to use the 1990 data in one of three basic ways:

1. To study the 1990 population of males 69-83 years of age, in many cases relating their current circumstances and characteristics to what has been learned about them in previous surveys. For studies of this kind the 1990 weights for the surviving men (derived by the procedure used in the past) would seem to be appropriate for the reasons elucidated in the preceding section.

2. To examine the 1990 status of members of the original sample. For this purpose the 1990 "total weight" is the appropriate one. In many studies of this kind some or all of the 1990 information may have come from the men's widows (or other relatives). This makes no difference so long as the appropriate weights for the men to whom the data relate are used.

3. To study members of the original sample who had died by 1990. In these cases all of the information obtained in the 1990 survey will, of course, have been reported by the widows or some other proxy for the decedent. The appropriate weight, therefore, is the combined widow-proxy weight.

Comparison of 1966 and 1990 Weighted Samples

In the light of all of the foregoing, it is clear that except for the fact that five surviving members of the original sample had left the country and no proxy could be found, the weighted total of the sample cases for which interviews were obtained in 1990 (surviving men and decedents) should theoretically equal the weighted total of the original 1966 sample. As the following figures

demonstrate, this is in fact the case, which inspires some confidence in the reweighting scheme:

1966 weighted total sample: 14,976,000
1990 weighted total sample
surviving men + decedents): 14,956,000

Ratio 1990/1976 = 14,956/14,976 = 99.9%

In addition, it will be recalled from Table 1 that when weighted NLS data for 1980 are compared with corresponding information from the 1/1000 sample of the 1980 Census, both population totals and percentage distributions by selected demographic and economic characteristics (e.g., age, race, education, marital status, labor force and employment status, income) are comfortably close.

In view of all of this, and of the fact that the original 1966 weights developed by the Census Bureau were adjusted to independent current (1966) estimates of the civilian male population by age and race, it is difficult to explain the fact that NLS estimates of the relevant population are consistently lower than Census estimates for 1981, 1983, and 1990--and larger in 1990 than in the earlier two years. Moreover, the disparity is considerably greater for blacks than for whites (Table 2). We have no explanation for these differences and have not attempted to make any adjustments for them.

Table 1

Selected Characteristics of Men 69-73 Years of Age, By Race, 1980:
Comparison of NLS Data and 1/1000 Sample, Decennial Census
(Percentage Distributions)

Characteristic	Total: All races*		Whites		Blacks	
	NLS	Census	NLS	Census	NLS	Census
Total population (millions)	12.1	11.9	11.0	10.6	0.9	1.0
<u>Age:</u>						
Total	100	100	100	100	100	100
59-63	39	40	39	40	40	40
64-68	34	34	34	34	36	35
69-73	27	26	27	26	24	25
<u>Years of schooling:</u>						
Total	100	100	100	100	100	100
< 9	34	31	32	29	64	58
9-11	19	19	19	19	17	17
12	26	27	27	28	13	15
13-15	9	11	10	11	3	6
16+	12	12	12	13	3	4
<u>Marital status:</u>						
Total	100	100	100	100	100	100
Married	85	83	86	84	72	66
Widowed	6	6	6	6	13	12
Sep/Div	5	6	4	5	11	16
Never mar.	4	5	4	5	4	6
<u>Labor force status:**</u>						
Total	100	100	100	100	100	100
OLF	61	57	61	56	64	63
Employed	38	41	38	42	33	35
Unemployed	1	2	1	2	3	2
<u>Weeks worked. 1979:***</u>						
Total	100	100	100	100	100	100
None	50	49	50	48	55	58
1-49	16	18	15	18	17	18
50+	34	33	35	34	28	24

Table 1 (Continued)

Selected Characteristics of Men 69-73 Years of Age, By Race, 1980:
Comparison of NLS Data and 1/1000 Sample, Decennial Census
(Percentage Distributions)

Characteristic	Total: All races*		Whites		Blacks	
	NLS	Census	NLS	Census	NLS	Census
<u>Wage/salary</u>						
<u>income. 1979:***</u>						
Total	100	100	100	100	100	100
None	63	56	63	56	60	60
\$5,000	10	11	10	11	14	12
\$5,000-14,999	10	14	10	13	15	18
\$15,000-24,999	11	12	11	12	9	7
\$25,000+	6	7	6	8	2	3
<u>Net family</u>						
<u>income:#</u>						
Total	100	100	100	100	100	100
\$5,000	21	19	17	17	34	35
\$5,000-14,999	39	31	35	32	47	35
\$15,000-24,999	21	24	24	24	12	17
\$25,000-49,999	16	21	20	22	7	12
\$50,000+	3	5	4	5	(a)	1

* Includes nonwhites/nonblacks.

** In week preceding survey week.

*** Calendar year 1979 for Census; 12-month period prior to August 1980 survey date for NLS.

Census data are for calendar year 1979; NLS data are from 1981 survey and relate to calendar year 1980. Class limits for NLS income categories have been inflated by percentage increases in median family income, 1979-1980.

(a) Less than 0.5 percent.

Table 2

Comparison of NLS and Census Population Estimates
NLS Older Male Cohort, Selected Years
(Percent Deviation of NLS from Census)

Age	All races	Whites	Blacks
<u>1980</u>			
Total			
59-73	+1.8	+3.4	-3.2
<u>1981</u>			
Total	-4.6	-2.7	-14.0
60-64	-5.5	-4.0	-11.9
65-69	-7.6	-5.1	-11.0
70-74	-0.3	+2.6	-22.7
<u>1983</u>			
Total	-3.2	-1.3	-13.2
62-66	-4.1	12.8	-9.1
67-71	-5.0	-3.2	-11.6
72-76	+0.6	+3.8	-22.7
<u>1990</u>			
Total	-5.7	-3.4	-17.3
69-74	-10.9	-9.0	-20.7
75-83	-5.5	-2.8	-20.5
<u>1990 (Adjusted for Mortality)*</u>			
Total	-5.7	-3.4	-17.3
69-74	-9.0	-7.0	-19.2
75-83	-1.7	+1.1	-16.1

*Census projections are for July 1 of each year; all but a few of the 1990 interviews were conducted in November-December of that year (whereas the earlier surveys were conducted in the summer). The estimates below have been made by taking into account estimated mortality (prepared by Frank L. Mott) by single year of age between July 1 and December 31, 1990.

Source: Census data for 1980 from 1/1000 sample of the 1980 Decennial Census; Census data for subsequent years from Current Population Reports, Population Estimates and Projections "Projections of the Population of the United States, by Age, Sex, and Race."