



82LTC

UNITED STATES DEPARTMENT OF COMMERCE  
Bureau of the Census  
Washington, D.C. 20233

August 19, 1982

MEMORANDUM FOR

From:

Subject: Weighting Specifications for the Long Term Care Survey (LTC)

This memorandum provides instructions for weighting LTC data from LTC screening interviews (called "screeners" below) and detailed interviews (LTC-3's) of those screened into the survey. Both a screener file and an LTC-3 file will be produced. Because of separate noninterview adjustments for the screener and LTC-3, a sample person's weight on the LTC-3 file will not necessarily equal that person's weight on the screener file. Summing screener weights will produce a national cross-sectional estimate of noninstitutionalized persons age 65 and over. Summing LTC-3 weights will provide the corresponding estimate of impaired persons as defined by the LTC.

Approximately 55,000 persons were selected for the LTC sample from files of Medicare recipients. About 51,000 of these were selected from a December 1981 file; the remaining 4,000 were selected from a March 1982 file. This "two step" sample selection will not effect weights. A subsample of the 55,000 sample persons is being screened. Screens are being conducted by telephone whenever possible. Personal visits are made when necessary. It is expected that over 6,000 persons will be screened into the LTC and undergo detailed interviews.

All sample persons were selected from within the 173 LTC primary sampling units (PSUs). Each LTC PSU consists of one or more current surveys (CS) PSUs. LTC PSUs were divided into two groups for purposes of sample selection; this division has no effect on weighting and is therefore ignored here.

The LTC sample selection procedure is described in the February 26, 1982 memorandum from \_\_\_\_\_, "Sampling Specifications for the Long Term Care Survey (LTC)." This memorandum, along with the May 18, 1982 memorandum, also from "Specifications for Computing First-Stage Ratio Estimate Factors for Weighting Data from the Long Term Care Survey," will be referred to in this memorandum.

Separate procedures are given below for computing screener weights and LTC-3 weights. The procedures are identical for the most part, the main difference being an additional stage of noninterview adjustment when computing LTC-3 weights.

Weights computed per these specifications are to be used to compute person estimates only. Probabilities of selection of households cannot be determined; therefore household weights are unknown.

## I. SCREENER WEIGHTS

Compute a screener weight for each sample person as follows.

### A. Base Weights

A person's base weight is defined as  $SI \times \frac{101}{r} \times k$ , where

SI = National sampling interval as defined in the LTC sampling specifications  
= 477.415818

r = number of reduction groups retained for the LTC sample (these are the first r reduction groups as listed in attachment F of the LTC sampling specifications).  
= 66

and

k = a factor to account for a sample reduction if necessary. It is likely that k will equal 1, i.e., there will be no sample reduction. If the sample is reduced, k may vary by screener type, i.e., telephone vs. personal visit (PV). PV screeners are those that are identified as telephone field type A non-interviews.

The 67th through 101st reduction groups should not have been screened. All persons in these reduction groups should be zero weighted and not included in the weighting process.

### B. Screener Noninterview Adjustment Factors

A noninterview adjustment factor is to be applied to the base weight of each screened person.

1. The following kinds of screener type A noninterviews are to be adjusted for.

#### PV Field Type A

Code 1 - Unable to locate/moved address unknown  
Code 2 - No one home  
Code 3 - Sample person temporarily absent/proxy unavailable  
Code 4 - refused  
Code 5 - Sample person unable to respond/proxy unavailable  
Code 6 - Other

#### Telephone or PV Field Type C

Code 8 - Deceased on or after April 1, 1982  
Code 10 - Institutionalized on or after April 1, 1982  
Code 12 - Moved outside country on or after April 1, 1982  
Code 13 - Moved within country, beyond limit

Noninterview reasons are found in item 26. of the LTC screener questionnaire (form LTC-2). Telephone Field type A noninterviews (codes 1-6) should all have been designated as PV screeners, so they should not be counted as noninterviews. Telephone or PV Field type C noninterviews with codes 7, 9, 11, 14, and 15 (for PV only) should be treated as type C noninterviews and zero weighted.

2. The 865 screener noninterview adjustment cells are defined by the following variables:

- a. Age on March 31, 1982 (65-74, 75-79, 80-84, 85+). This can be determined from the date of birth on the LTC sample file or from the age stratum code defined in the LTC sampling specifications.
- b. Original reason for Medicare entitlement (age, disability), for age 65-74 only. This is determined by Data Code 4 on the LTC sample file and is identical to the substratum code defined in II.E.3 of the LTC sampling specifications, i.e.,

Data Code 4 = 0 => age

Data Code 4 = 1, 2, 3 => disability

c. LTC PSU

A person's LTC PSU number can be obtained from the LTC sample file.

3. For each of the 865 screener noninterview cells, compute weighted (using the base weight) and unweighted tallies of interviewed and of type A noninterviewed persons. Also compute the screener noninterview adjustment factor for each cell,

$$F_h = \frac{I_h + A_h}{I_h} ,$$

where  $I_h$  and  $A_h$  are the weighted number of interviews and type A noninterviews, respectively, in the  $h^{\text{th}}$  screener noninterview adjustment cell.

Printout the weighted and unweighted tallies and the screener noninterview adjustment factors in the format specified in attachment B. SMD will examine the factors and collapse cells as necessary; this should prove more cost effective than computerizing the cell collapsing procedure. The weighting procedure should be interrupted at this point, since cell collapsing will change the values of the  $F_h$ 's for the effected cells and the rest of the weighting procedure depends on these values. Printout the tallies and factors again after the cells are collapsed.

### C. First-Stage Ratio Estimate Factors

Apply a first-stage ratio estimate factor to the weight of each person in each NSR LTC PSU. A list of NSR LTC PSUs appears as attachment C of the specifications for computing LTC first-stage ratio estimate factors. A first-stage factor will be computed for each of 32 cells as outlined in those specifications. Remember that some factors may be changed from the computed values due to cell collapsing by SMD.

1. For each person selected from an NSR LTC PSU, determine the cell the person belongs in as specified below.
  - a. Census region (Northeast, North Central, South, West). Census region is given by state in attachment A.
  - b. Residence (SMSA, non-SMSA)
 

Residence status varies by LTC PSU. All but four LTC PSUs are entirely SMSA or non-SMSA areas. Attachment C of the LTC first-stage factor specifications, gives the residence status of each nonself-representing (NSR) LTC PSU. Attachment E of this memorandum gives the residence status of each self-representing (SR) PSU. Note that, with the exception of three mixed SMSA/non-SMSA LTC PSUs, all SR LTC PSUs are SMSA.

    - (1) For all but the four mixed SMSA/non-SMSA LTC PSUs, assign each person the residence status of the LTC PSUS he/she was sampled from.
    - (2) For each of the remaining four LTC PSUs (101, 102, 109, 125), printout all records from the two LTC address files (described in V.C. of the LTC sampling specifications), sorted by post office (i.e., town, city, etc.) within LTC PSUs. Knowing the composition of each of these LTC PSUs and the residence status of each component, residence status will be clerically assigned to persons according to their addresses.
  - c. Age on December 31, 1981 (65-74, 75-79, 80-84, 85+).
 

Note that this age is defined for a different time than that for determining the age used to assign age stratum codes for sample selection.
2. Apply the first-stage factor for the appropriate region x residence x age cell to each person's weight.

### D. Second-Stage Ratio Estimate Factors

A second-stage ratio estimate factor should be applied to the weight of each person. A second-stage factor will be computed for each of 20 age x race x sex cells. The appropriate factor should then be applied to each person's weight.

1. Determine each person's cell as follows:
  - a. Age on August 1, 1982 (65-69, 70-74, 75-79, 80-84, 85+).
  - b. Race (Black, non-black). Race is given in item 14. on the LTC-2. There are five race categories on the questionnaire and control card:
    - 1 - White
    - 2 - Black
    - 3 - Asian or Pacific Islander
    - 4 - American Indian, Eskimo, or Aleut
    - 5 - Other

If a person's race is not given on the LTC-1 or LTC-2, then attempt to obtain race from the LTC sample file. Assign codes 1, 2, and 3 (white, black, and other, respectively) on the sample file to the appropriate race on the LTC-1 and LTC-2. If the sample file indicates the race is unknown (code 0) then impute, using the race of the first preceding person whose race is known (i.e., not imputed) in the age group (as defined in a. above) of the person whose race is in question. If there is no such preceding person then designate the race as white.

Assign codes 1, 3, 4, and 5 to non-black and Code 2 to black.

- c. Sex (male, female). This is found in item 4c. of the LTC-2.
2. Compute a second-stage factor for each of the 20 cells:
    - a. Calculate the weighted number of persons in each cell. The weight to use is (base weight) x (screener noninterview adjustment factor) x (first-stage factor).
    - b. Population Division has provided independent estimates of the August 1, 1982 civilian noninstitutional population for each cell. These are given in attachment C.
    - c. The second-stage ratio estimate factor for a given cell is equal to
 
$$\frac{\text{Independent estimate of cell population}}{\text{Weighted number of persons in the cell}}$$

Printout the independent estimate, weighted number of persons, and second-stage factor for each cell. SMD will examine the factors and will collapse cells if necessary. Any collapse will, of course, require reweighting from this point on.

#### E. Final Screener Weights

A person's final screener weight is equal to (base weight) x (screener noninterview adjustment factor) x (first-stage ratio estimate factor) x (second-stage ratio estimate factor).

## II. LTC-3 WEIGHTS

Compute an LTC-3 weight for each person screened into the LTC as follows.

### A. Base Weights

## B. Screener Noninterview Adjustment Factors

Apply a screener noninterview adjustment factor to each person's weight. This factor is the same as that computed when determining screener weights.

## C. LTC-3 Noninterview Adjustment Factors

Apply a noninterview adjustment factor to the weight of each interviewed (LTC-3 interview) person.

1. The following kinds of LTC-3 noninterviews will be adjusted for.

### Field Type A

- Code 1 - Unable to locate/moved, address unknown
- Code 2 - No one home
- Code 3 - Sample person temporarily absent/proxy unavailable
- Code 4 - Refused
- Code 5 - Sample person unable to respond/proxy unavailable
- Code 6 - Other

### Field Type C

- Code 7 - Deceased on or after April 1
- Code 8 - Institutionalized on or after April 1
- Code 9 - Moved outside country on or after April 1
- Code 10- Moved within country beyond limit

Noninterview reasons are given in item 10 of the LTC control card (form LTC-1). Code 11, Field type C other noninterviews should be treated as type C noninterviews and given zero weights.

2. The 32 LTC-3 noninterview cells are defined by the following variables:

- a. Residence (SMSA, non-SMSA)  
This was determined in I.C.1.b.
- b. Impairment as reported on the LTC-2 (ADL only, IADL only, ADL and IADL, assumed ADL and IADL--this is explained below).

Determine a person's impairment as follows, where all numbers and letters refer to questions on the LTC-2.

(1) A person is considered to be "ADL only" if

20 a., b., or c. is marked "yes"  
and

19 e. is marked "no"  
and

24 a., b., and c. are all marked "no" or all blank

(2) A person is considered to be "IADL only" if

20a., b., and c. are all marked "no" or all blank  
or

19a. through d. and 19f. through i are all marked  
"no" and 19e. is marked "yes" and 20a., b., or c. is  
marked "yes"

(3) 19e. is an IADL item while the rest of 19. consists of  
ADL items. This causes confusion when 19e. and any other  
part of 19 are both marked "yes." For noninterview  
adjustment, a person is assumed to be "ADL and IADL" if

19a. through d. and 19f. through i. are not all  
marked "no"

and  
19e. is marked "yes"

and  
20a., b., or c. is marked "yes"

(4) A person is considered to be "ADL and IADL" if

19a. through d. and 19f. through i. are not all  
marked "no"

and  
19e. is marked "no"

and  
20a., b., or c. is marked "yes"

and  
24a., b., or c. is marked "yes"

c. Census region (Northeast, North Central, South, West)

This was determined in I.C.1.a.

3. Compute LTC-3 noninterview adjustment factors as follows:

a. For each of the 32 LTC-3 noninterview cells, compute weighted and unweighted tallies of interviewed and of type A noninterviewed persons. The weight to use here is the final screener weight defined in I.E. Also compute the LTC-3 noninterview adjustment factor for each cell using the formula given in I.B.3. where, of course,  $h$  refers here to LTC-3 noninterview adjustment cells and  $I_h$  and  $A_h$  are the weighted tallies of LTC-3 interviews and type A noninterviews obtained above.

Printout the weighted and unweighted tallies and the LTC-3 non-interview adjustment factors in the format specified in attachment D. SMD will examine the factors and collapse cells as necessary. Again, the weighting procedure should be interrupted while SMD collapses cells as necessary and recomputes the  $F_h$ 's for the collapsed cells. Printout the tallies and factors again after the cells are collapsed.

b. Also compute additional LTC-3 noninterview adjustment factors, only for use in forming unbiased estimates, by following the instructions in a. but substituting  $(\text{base weight}) \times (\text{screener noninterview adjustment factor})$  for the final screener weight.

#### D. First-Stage Ratio Estimate Factors

Apply a first-stage ratio estimate factor to the weight of each person. This factor is equal to that defined in I.C.

#### E. Second-Stage Ratio Estimate Factors

Apply a second-stage ratio estimate factor. This factor is equal to that determined in I.D.

#### F. Final LTC-3 Weights

A person's final LTC-3 weight is equal to (base weight) x (screener noninterview adjustment factor) x (LTC-3 noninterview adjustment factor #1) x (first-stage ratio estimate factor) x (second-stage ratio estimate factor).

#### G. Flagging "False Positives"

Some persons will have been screened into the LTC and undergone the detailed LTC-3 interview when they actually are not impaired (as defined for the LTC). Such individuals were intentionally screened in to ensure that no person who should have been screened in was rejected by the screening process. These "false positives" should receive LTC-3 weights but are to be flagged so that they can easily be identified should it be desired to exclude them when making estimates concerning impaired persons. Specifications for flagging the appropriate records during merging of the screener and LTC-3 files will be developed by your staff.

### III. OUTPUT

Produce the printed output and data tapes specified below.

#### A. Printed Output

Provide the following output so that SMD might evaluate the weighting procedure and its implementation.

1. SI, r, and k (if  $k \neq 1$  for all persons)
2. Base weights for telephone and PV screeners (these will be identical if there is no sample reduction).
3. Unweighted tallies by LTC PSU of interviewed persons and of noninterviewed persons by type of noninterview, separately for telephone screeners, PV screeners, and LTC-3's.
4. Weighted tallies of interviews by noninterview cell before and after noninterview adjustment separately for screener noninterview adjustment, LTC-3 noninterview adjustment #1, and LTC-3 noninterview adjustment #2. Use the final screener weights for LTC-3 adjustment #1 and (base weight) x (screener noninterview adjustment factor) for LTC-3 adjustment #2.



Also printout the tallies and factors specified in I.B.3. for screener noninterview adjustment and those specified in II.C.3. for LTC-3 noninterview adjustment.

5. For screener weighting only, weighted and unweighted tallies of persons by cell before and after each stage of ratio estimation.

Also printout the first-stage ratio estimate factor for each first-stage cell.

For second-stage ratio estimation, provide independent estimates and second-stage ratio estimate factors by second-stage cell.

## B. Data Tapes

Produce the following data tapes:

1. Produce a screener file containing the screener record of each sample person, including screener noninterviews. Each person should have a final screener weight assigned according to these specifications. Also assign the weight before ratio adjustment, i.e.,  $(\text{base weight}) \times (\text{screener noninterview adjustment factor})$ , so that unbiased estimates may be computed. All noninterviews should be assigned zero screener weights.
2. Produce an LTC-3 file containing the screener, control card, and LTC-3 record of each person screened into the LTC, including LTC-3 noninterviews. Each person should have a final LTC-3 weight assigned according to these specifications. In addition, assign the weight before ratio adjustment, i.e.,  $(\text{base weight}) \times (\text{screener noninterview adjustment factor}) \times (\text{LTC-3 noninterview adjustment factor \#2})$ , so that unbiased estimates may be computed. All LTC-3 noninterviews should be assigned zero LTC-3 weights. Flag "false positives" as indicated in II.G.

## Attachments

ATTACHMENT A: States and Their SSA State Codes by Census Region

<u>Northeast</u>	<u>North Central</u>	<u>South</u>	<u>West</u>
CT 07	IL 14	AL 01	AK 02
ME 20	IN 15	AR 04	AZ 03
MA 22	IA 16	DE 08	CA 05
NH 30	KS 17	DC 09	CO 06
NJ 31	MI 23	FL 10	HI 12
NY 33	MN 24	GA 11	ID 13
PA 39	MO 26	KY 18	MT 27
RI 41	NE 28	LA 19	NV 29
VT 47	ND 35	MD 21	NM 32
	OH 36	MS 25	OR 38
	SD 43	NC 34	UT 46
	WI 52	OK 37	WA 50
		SC 42	WY 53
		TN 44	
		TX 45	
		VA 49	
		WV 51	

Attachment B: Format for Printout of Screener  
Noninterview Adjustment Parameters

Printout the weighted tallies, unweighted tallies, and factors for screener noninterview adjustment in the following format. LTC PSUs should be sorted by regional office. Note that for persons 65-74 years of age, those originally entitled due to disability precede those originally entitled due to age, in contrast to the order used in selecting the LTC sample.

The format within each cell is not specified. The cells themselves should be laid out as shown.

		AGE			
		65-74	75-79	80-84	85+
		Original reason for entitlement			
Regional Office		Age	Disability		
Boston	LTC PSUs ⋮				
New York	LTC PSUs ⋮				
⋮	⋮				
Los Angeles	LTC PSUs ⋮				

ATTACHMENT C: Independent Estimates of August 1, 1982 Civilian  
 Noninstitutional Population by Age, Race, and Sex

	Black		Non-black	
	<u>Male</u>	<u>Female</u>	<u>Male</u>	<u>Female</u>
65-69	318,698	438,117	3,602,492	4,467,461
70-74	242,180	351,226	2,715,014	3,724,663
75-79	152,225	237,276	1,740,160	2,721,514
80-84	83,169	144,057	920,838	1,688,185
85+	52,185	101,212	565,766	1,185,966

ATTACHMENT D: Format for Printout of LTC-3 Noninterview Adjustment Parameters

Printout the weighted tallies, unweighted tallies, and factors for LTC-3 noninterview adjustment in the format specified below. The format within each cell is not specified. The cells should be laid out as follows.

		IMPAIRMENT							
		IADL ONLY		ADL AND IADL		Assumed ADL AND IADL		ADL ONLY	
		Residence		Residence		Residence		Residence	
		SMSA	Non-SMSA	SMSA	Non-SMSA	SMSA	Non-SMSA	SMSA	Non-SMSA
R E G I O N	NE								
	NC								
	S								
	W								

ATTACHMENT E: Residence Status of SR LTC PSUs

SMSA SR LTC PSUs:

103	104	105	106	107	108
201	202	203	204	205	206
207	208	209			
301	302	303	304	305	306
307	308	309	310		
401	402	403	404	405	406
407	408	409	410	411	

Non-SMSA SR LTC PSUs:

None

Mixed SMSA/non-SMSA SR LTC PSUs:

101	102	109
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