VARIANCE ESTIMATION AND THE REDESIGNED NATIONAL HEALTH INTERVIEW SURVEY

Van L. Parsons, National Center for Health Statistics
Robert J. Casady, Bureau of Labor Statistics

I. Introduction

The National Health Interview Survey (NHIS), sponsored by the National Center for Health Statistics and produced with the cooperation of the Bureau of the Census, has been redesigned for the data collection years 1985 to 1995. The purpose of this paper is to present design and estimation methodology which should facilitate the analysis of NHIS data. In Section II the NHIS redesign is presented under an idealized framework, in Section III estimation for the NHIS is discussed, and in Section IV several examples, based upon preliminary 1985 data, are given.

II. A conceptual model for the 1985-1995 design

The NHIS can be considered as a complex multistage probability sample. The basic structure is outlined below.

A. Stratification and Primary Stage Units

The primary sampling units (PSUs) of the universe were partitioned into 52 self-representing strata (SR) and 73 nonself-representing strata (NSR).

B. Second Stage Units

The PSUs were first partitioned into geographically compact areas called enumeration districts (EDs) which were further partitioned into geographical compact areas called blocks. Within each block, clusters of an expected eight housing units were formed to serve as secondary stage sampling units (referred to as area segments). Housing units constructed after the 1980 Decennial Census were excluded from the clustering process described above in those geographical areas where it was possible to form lists of "new construction" housing units. The "new construction" lists were used to form clusters of an expected four housing units to serve as secondary stage sampling units (referred to as permit segments).

C. Substratification of Segments Within PSUs

The segments within each PSU were partitioned into as many as three substrata.

Substratum 1 - This substratum contained all permit segments.

Substratum 2 - PSUs with 5 to 50 percent Black population were targeted for the oversampling of Blacks. Substratum 2 contains area segments having a "large" proportion of Blacks.

Substratum 3 - In PSUs targeted for oversampling, this substratum contains all area segments not contained in Stratum 2.

D. First Stage Sample Selection

For the full NHIS design all 52 PSUs from the SR strata were included in the sample with certainty. Within the NSR strata two PSUs were selected without replacement and with probability proportional to relative size within the stratum using Durbin's (1967) procedure.

E. Second Stage Sample Selection

The following two assumptions appear to reasonably describe the selection of segments within the sample PSUs.

1. The process of second stage sampling within a PSU was independent of the second stage sampling within other PSUs. Also, second stage sampling within a substratum was independent of the second stage sampling within other substrata.
2. Within each substratum the sample segments were selected by a random systematic sample. In substrata 2 and 3 this sample was based upon an implicit stratification of the ED's within the substrata.

It should be noted that the second stage sampling rates satisfied the following conditions.

i. The overall sampling interval for second stage units for the full NHIS design was SI = 1638.4365.

ii. Within a sample PSU, say i, the average second stage sampling rate, $f_{i.}$ was determined by the equation

$$f_{i.} \cdot \text{Prob(PSU i chosen)} = 1/SI.$$

iii. Assuming the three substrata within PSU i have sizes M_{i1}, M_{i2} and M_{i3} segments (expressed in comparable units over substrata), the respective sampling rates f_{i1}, f_{i2} and f_{i3} satified

$$f_{i.} \cdot \sum_{j=1}^{3} M_{ij} = \sum_{j=1}^{3} f_{ij} \cdot M_{ij}$$

with $f_{i2} > f_{i3}$ (oversampling of "Black" segments)

and $f_{i1} = f_{i.}$ (no oversampling of "new construction units").

It should be noted that if PSU i is not oversampled for Blacks then the sampling rate for both the permit segments and the area segments is f_i.

F. Third and higher stages of sampling

Within a segment the subsampling of housing units, households, families may be performed.

III. Estimators of Totals and their Variances

A. Basic Inflation Estimators: General Methodology

Under the conceptual NHIS design, a Horvitz-Thompson estimator for a population characteristic can be constructed. For simplicity of discussion it will be temporarily assumed that the universe contains one stratum and each PSU has three substrata. Each segment is collection of elementary units of interest, (e.g. persons, households, etc.). Associated with each elementary unit is some characteristic, say x.

A.1 Notation:

N = the number of PSUs in the stratum

n = the number of PSUs selected for sample

π_i = the probabitity of selecting PSU i

π_{ig} = the probability of selecting PSUs i and g

M_{ij} = number of segments in substratum j of PSU i

m_{ij} = number of sample segments in substratum j of PSU i

$f_{ij} = m_{ij} / M_{ij}$, the sampling fraction within substratum j of PSU i

X_{ijk} = the aggregate for characteristic x over all elementary units in segment k of substratum j of PSU i

$X_{ij.} = \sum_{k=1}^{M_{ij}} X_{ijk}$, the total for stratum j of PSU i

$\bar{X}_{ij.} = X_{ij.} / M_{ij}$, the mean total for all segments in substratum j of PSU i

$X_{i..} = \sum_{j=1}^{3} X_{ij.}$, the total for PSU i

$X_{...} = \sum_{i=1}^{N} X_{i..}$, the stratum total

$\hat{X}_{ijk}$ = the estimator for X_{ijk} whenever PSU i, substratum j and segment k are selected at the first and second stages of sampling

$\hat{X}_{ij.} = (1/f_{ij}) \sum_{k=1}^{m_{ij}} \hat{X}_{ijk}$, an estimator for $X_{ij.}$

$\bar{\hat{X}}_{ij.} = \hat{X}_{ij.} / m_{ij}$, the mean total for sample segments in substratum j of PSU i

$\hat{X}_{i..} = \sum_{j=1}^{3} \hat{X}_{ij.}$,an estimator for $X_{i..}$

$S^2_{ij} = \sum_{k=1}^{M_{ij}} (X_{ijk} - \bar{X}_{ij.})^2 / (M_{ij} - 1)$, the substratum variance

$s^2_{ij} = \sum_{k=1}^{m_{ij}} (\hat{X}_{ijk} - \bar{\hat{X}}_{ij.})^2 / (m_{ij} - 1)$, an estimator of variance.

A.2 A fundamental result from sampling theory.

Assuming the conceptual design, estimators of totals and their variances, which are approximately unbiased, may be constructed. The motivation for the proposed estimators lies in the following result. (See Chapters 8 and 11 of Cochran (1977) for a general discussion.)

If $E(\hat{X}_{ijk} \mid$ PSU i ,substratum j, segment k $) = X_{ijk}$,

$Var(\hat{X}_{ijk} \mid$ PSU i, substratum j,segment k$) \equiv \sigma^2(i,j,k)$,

r_{ij} is the intracluster correlation coefficient for substratum j within PSU i as defined in equation (8.7) of Cochran (1977), (it is assumed that all systematic samples are of the same size) then

(1.0) An unbiased estimator of an NSR stratum total, $X_{...}$, is

$$\hat{X}_{...} = \sum_{i=1}^{n} (1/\pi_i) \hat{X}_{i..}$$

which has sampling variance

$$\sum_{i=1}^{N} \sum_{g>i}^{N} \beta_{ig} \cdot [X_{i..}/\pi_i - X_{g..}/\pi_g]^2$$

$$+ \sum_{i=1}^{N} (1/\pi_i) \left[\sum_{j=1}^{3} (M^2_{ij}/m_{ij}) \; G_{ij} \; S^2_{ij} + \sum_{j=1}^{3} \sum_{k=1}^{M_{ij}} (1/f_{ij}) \sigma^2(i,j,k) \right]$$

where $\beta_{ig} = (\pi_i \pi_g - \pi_{ig})$ and

$$G_{ij} = \frac{M_{ij}-1}{M_{ij}} [1 + (m_{ij}-1) r_{ij}]$$

An estimator of $Var(\hat{X}_{...})$ is

$$\sum_{i=1}^{n} \sum_{g>i}^{n} \beta_{ig}/\pi_{ig} [\hat{X}_i/\pi_i - \hat{X}_g/\pi_g]^2$$

$$+ \sum_{i=1}^{n} (1/\pi_i) \cdot \sum_{j=1}^{3} (M^2_{ij}/m_{ij}) \; s^2_{ij}$$

The expection of this quantity is

$$\sum_{i=1}^{N} \sum_{g>i}^{N} \beta_{ig} \cdot [X_{i..}/\pi_i - X_{g..}/\pi_g]^2$$

$$+ \sum_{i=1}^{N} (1/\pi_i) \left[\sum_{j=1}^{3} (M^2_{ij}/m_{ij}) G_{ij} C_{ij} S^2_{ij} + \sum_{j=1}^{3} \sum_{k=1}^{M_{ij}} (1/f_{ij}) \sigma^2(i,j,k) \right]$$ where

$$C_{ij} = 1 - \pi_{ij} \cdot m_{ij} \cdot r_{ij}/[1+(m_{ij}-1)r_{ij}]$$

A.3 Bias of the variance estimator

The bias of the proposed variance estimator depends upon the intracluster correlation coefficient, r_{ij}, defined by the systematic sampling procedure. If cases of nonvariable systematic sample means are eliminated, then $r_{ij} > -1/(m_{ij}-1)$. Defining a systematic sample via an implicit stratification within a substratum should result in $r_{ij} \leq 0$. This latter bound implies that $C_{ij} \geq 1$, and hence, the proposed estimators will tend to overestimate variance. It is felt, however, that the bias introduced will be relatively small since the implicit stratification variables used to order the universe segments have little correlation with most NHIS variables. The value of r_{ij} should be close to $-1/(M_{ij}-1)$, the correlation coefficient for a simple random sample without replacement procedure.

For an assumed simple random sample, the value of G_{ij} becomes $(1 - f_{ij})$ and the value of C_{ij} becomes $1 + [\pi_i f_{ij} / (1-f_{ij})]$. For NHIS probabilities of selection, this value of C_{ij} would be close to unity in the majority of cases.

B. Inflation estimators for the NHIS

The results of A. can best be adapted to the NHIS by considering segment totals, which have been inflated by the product of all basic inflation weights, as the fundamental unit. Let h =1,2,... be an ordering of all sample segments. For a characteristic x and segment h in substratum j of PSU i of stratum s let

$$\hat{X}_{bh} = (1/\pi_{si}) \cdot (1/f_{sij}) \cdot \sum x \cdot (W3+)$$

with the sum over all elementary units in segment h, inflating the response characteristic x by the inverse of the segment subsampling probabilities (W3+). (The responding segment units are treated as resulting from a higher order subsampling scheme within the segment. This adjustment is included in W3+.)

The basic inflation weights may also be absorbed into the substratum sample variance formula. Let

$$s^2_{bij} = (1/\pi_i)^2 \cdot (1/f_{ij})^2 \cdot s^2_{ij}$$

With this notation the basic estimator of the universe total can be expressed:

$$\hat{X}_b = \sum_h \hat{X}_{bh} \qquad (2.0)$$

and the variance estimator can be expressed as a function of $\hat{\underline{X}}_b$, the vector of all $\hat{X}_{bh}$ estimators,

$$\hat{Var}(\hat{X}_b) = V(\hat{\underline{X}}_b) \qquad (3.0)$$

$$= \sum_{i:\ \text{SR-PSU}} \sum_{j=1}^{3} m_{ij} \cdot s^2_{bij}$$

$$+ \sum_{s:\ \text{NSR stratum}} \frac{\beta_{s12}}{\pi_{s12}} \cdot [\hat{X}_{bs1} - \hat{X}_{bs2}]^2$$

$$+ \sum_{i=1}^{2} \pi_{si} \cdot \sum_{j=1}^{3} m_{sij} \cdot s^2_{sbij}$$

(Formulae (2.0) and (3.0) are easily adapted to NHIS data tapes.)

C. Non-Linear Estimation and Ratio Adjustments

For the NHIS, each individual's base weight is multiplied by both a first stage and poststratification ratio adjustment. Unlike the basic weight estimators of totals, these ratio adjusted estimators are non-linear and therefore approximate methods must be used for variance estimation; see Rust (1985). For the NHIS it was decided to use Taylor linearization procedures to approximate variances. Further discussion of this decision is given in Casady, Parsons and Snowden (1986).

Before the first and second order ratio adjusted estimators are given, a brief review of the variance approximation methodology for non-linear estimators, as proposed by Woodruff (1971) is given.

C.1 Woodruff's Linearization Procedure

Consider a universe with N elements. For a specified sample design, D, define

a_i = 1 if element i is chosen for sample
0 otherwise

Assume that if $\underline{X} = X_1, X_2, \ldots, X_N$ are known real numbers associated with the universe elements then a variance estimator for the linear estimator $\hat{L} = \sum_{i=1}^{N} a_i X_i$ exists and can be expressed as $\hat{V}(D,\underline{X})$. If a non-linear estimator, $\hat{\theta}$, can be expressed by Taylor's series as $\hat{\theta} \approx \sum_{i=1}^{N} a_i X_i^*$, then a variance estimator of $\hat{\theta}$ is $\hat{V}(D,\underline{X}^*)$

C.2 First Stage Ratio Adjustment

The estimator for a characteristic total using the first stage ratio inflation factor is defined as follows:

Let c = 1,2,...,16 be an index set corresponding to the 16 region-race-residency classes within the NSR PSUs,

z_{ci} = the Census total for the class c within NSR PSU i inflated by $(1/\pi_i)$,

z_c = the Census total for the class c,

$\hat{z}_c = \sum_{s:NSR} \sum_{i=1}^{2} z_{sci}$, an estimator for z_c,

$\hat{X}_{bhc}$ = base weight aggregate for segment h and class c (for NSR segment h)

The first stage ratio estimator for the universe total is:

$$\hat{X}_1 = \sum_{h:SR} \hat{X}_{bh} + \sum_{h:NSR} \sum_{c} \hat{X}_{bhc} \cdot (z_c / \hat{z}_c)$$

The variance of $\hat{X}_1$ may be estimated by substituting the linearized variables U_h for the variables $\hat{X}_{bh}$ in the expression (3.0)

$$U_h = \begin{cases} \hat{X}_{bh} , & h \text{ an SR segment} \\ \sum_{c} K_{1c} (\hat{X}_{bhc} - K_{2c} [z_{ci}/m_i]), & h \text{ an NSR segment in PSU } i \end{cases}$$

where $m_i = m_{i1} + m_{i2} + m_{i3}$, the number of sample segments in PSU i,

$K_{1c} = z_c / E(\hat{z}_c)$: estimated with $z_c/\hat{z}_c$,

$K_{2c} = E(\sum_h \hat{X}_{bhc}) / E(\hat{z}_c)$:estimated with $\sum_h \hat{X}_{bhc} / z_c$.

C.3. Poststratification ratio adjustment

Let a = 1,2,...60 be an index set corresponding to the 60 poststratification age-race-sex classes. The poststratification total is

$$\hat{X}_2 = \sum_{a} (\hat{X}_{1a}/\hat{Y}_{1a}) \ Z_a$$

where $\hat{X}_{1a}$ is the first stage estimator of total for the characteristic x in class a, and

$\hat{Y}_{1a}$ is the first stage estimator of total for the population in class a.

Z_a = census total for the poststratification cell a

The variance of $\hat{X}_2$ may be estimated by substituting the linearized variables U_h for the variables $\hat{X}_{bh}$ in expression (3.0)

$$U_h = \sum_{a} R_{1a} (U_{1h} - R_{2a} U_{2h})$$

where U_{1h} and U_{2h} are the first stage ratio adjustment U_h-terms for the linearizations of $\hat{X}_{1a}$ and $\hat{Y}_{1a}$, respectively,

$R_{1a} = Z_a / E(\hat{Y}_{1a})$: estimated by $Z_a/\hat{Y}_{1a}$

$R_{2a} = E(\hat{X}_{1a}) / E(\hat{Y}_{1a})$: estimated by $(\hat{X}_{1a} / \hat{Y}_{1a})$

C.4 Ratios of two poststratification totals

In the NHIS population, means rather than population totals are of main interest. The ratio of two poststratification totals will be expressed:

$$R = N_2 / D_2$$

The U_h transformation is

$$U_h = C_1 (U_{1h} - C_2 U_{2h})$$

where U_{1h} and U_{2h} are the poststratification adjustment U_h terms for the linearizations of N_2 and D_2, respectively,

$C_1 = 1/E(D_2)$: estimated by $1/D_2$,

$C_2 = E(N_2)/E(D_2)$: estimated by (N_2/D_2).

IV <u>Design Modifications for 1985 and Examples</u>

A. Sample Reduction in 1985

Budgetary considerations required the NHIS design to be modified to achieve a 25 percent sample reduction in the 1985 data collection year. This reduction was met by utilizing one of the NHIS design features: the NHIS was originally partitioned into four "equal" subdesigns or panels. Dropping a panel from the active 1985 sample resulted in the meeting of budgetary constraints. A brief description of the methodology used is now presented.

All universe strata were collapsed into 62 superstrata. This was achieved by first classifying the strata by population size: Large-SR, Medium-SR, Small-SR and NSR, and then collapsing by stratum characteristics. Six types of collapsed strata resulted; their contents are:

CS1: One Large-SR stratum
CS2: Two Medium-SR strata
CS3: Two Small-SR strata and one Medium stratum
CS4: Four Small-SR strata
CS5: Two NSR strata
CS6: One NSR stratum and Two Small-SR strata

After the first and second stage sampling of the full NHIS design had been completed, the sample in each collapsed stratum was partitioned into four "similiar" components.

CS1 : The full sample of segments was randomly divided into 4 subsamples.

CS2: The full sample of each Medium-SR PSU was randomly divided into 2 subsamples.

CS3: The full sample from each of 2 Small-SR PSUs was kept intact and the full sample of the Medium-SR PSU was divided into 2 subsamples.

CS4, CS5, CS6 : The full sample from each of 4 PSU's was kept intact.

The sample reduction was achieved by randomly dropping one of the four components from each stratum. The methodology discussed in Sections II and III can be adapted to this resulting design.

Collapsed strata CS4,CS5 and CS6 may be treated as NSR strata in which three sample PSU's are chosen with the following probabilities:

$$P(\text{ PSU } i \text{ chosen }) = (3/4)\ \pi_i$$

$$P(\text{ PSU } i \text{ and PSU } g \text{ chosen}) = (1/2)\ \pi_{ig}$$

Collapsed stratum CS1 may be treated as an SR stratum.

For this study, the Medium-SR PSU's were treated as SR-PSU's but with having a full or half sample size with probability 1/2. For these collapsed strata, conditional Horvitz-Thompson estimators were used to achieve variance reduction within the collapsed strata types CS2 and CS3. Conditional variance estimators were also developed. For computational simplicity, one may approximate the design for collapsed stratum type CS2 as two SR-stratum with fixed sample sizes, and treat collapsed stratum type CS3 as a type CS4 but treating the Medium SR-stratum within as two distinct strata. This latter computational approach was not used in the examples which follow, but since few actual cases of the survey actually fall into CS2 and CS3, the methodology chosen will have little impact.

B. Impact of Weighting Adjustments upon Estimation: Some Examples

The NHIS estimation methodology is demonstrated in the Table using the preliminary Quarter 1, 1985 NHIS data tape. This data represents a national sample of approximately 1300 segments containing 23,000 interviewed persons. First and second order estimation examples for means are provided for typically published health variables for variables 1 to 6 and for demographic variables for variables 7 and 8.

In order to study the impact of the ratio adjustments upon estimation, the mean square error of an estimator should be analyzed under the different strategies. At this time the bias component has not been studied for the redesign NHIS, and it will be treated as negligible for the three types of estimators. Historically in the NHIS, some poststratification cells suffered from undercoverage, and the poststratification may reduce the bias in some situations.

For the health variables, the first stage ratio adjustment has little impact upon the standard error estimate. The standard error for the first stage ratio estimator appears to fluctuate -3% to +3% about the base estimate standard error. The estimators for characteristic totals behaved similarly. The second stage ratio adjustment appears to be more influential. There usually is a 0% to 6% reduction in standard error due to this adjustment over the base and first stage estimator. Many of the health variables measured by the NHIS are not highly correlated with the poststratification classes and consequently, the second stage ratio adjustment does not have a large scale impact .

<u>References</u>

Cochran, W.G. (1977) <u>Sampling Techniques</u>, 3d ed., John Wiley and Sons, New York.

Durbin, J. (1967) Design of multi-stage for the estimation of sampling errors, <u>App. Stat.</u>, 16,152-164.

Casady, R.J., Parsons, V.L., Snowden, C.B. (1986) Simplfied National Health Interview Survey Design and impact upon variance estimation. ASA Proceedings On Survey Research Methods.

Rust, K. (1985), Variance estimation for complex estimators in sample surveys, Journal of Official Statistics, 1, 381-397.

Woodruff, R.S. (1971) A simple method for approximating the variance of a complicated estimate. Jour. Amer. Stat. Assoc., 66, 411-414.

Table

Impact of Weighting Adjustment upon the First Order Estimate and the Standard Error (SE) for the Estimator: Quarter 1 1985, NHIS Sample

		Base Weight		1st Stage Ratio Adjustment		1st and 2nd Stage Ratio Adjustment	
VARIABLE	DOMAIN	EST	SE(B)	EST	SE as % of SE(B)	EST	SE as % of SE(B)
(1) Percent of Population Reporting Excellent Health Status	U.S	38.0	0.60	38.1	100.3%	38.0	95.6%
	Age 65+	15.6	0.89	15.7	100.2%	15.6	98.6%
	Female	35.1	0.68	35.2	100.3%	34.9	94.3%
	Black	29.1	1.40	29.4	101.8%	29.3	97.0%
	South	35.9	1.08	36.1	99.9%	36.0	96.3%
	West	42.0	1.31	42.0	100.0%	42.0	99.4%
	Poverty	26.8	1.25	26.9	100.6%	26.8	98.3%
	Black-South	25.6	1.89	25.9	103.2%	26.0	100.7%
(2) Percent of Persons Reporting One or More Hospital Episodes the Last Year	U.S	9.5	0.21	9.5	100.0%	9.6	93.4%
	Age 65+	20.8	0.75	20.7	99.2%	20.7	99.2%
	Female	11.1	0.31	11.1	100.4%	11.2	98.0%
	Black	9.3	0.56	9.3	99.8%	9.5	98.3%
	South	10.2	0.38	10.2	99.5%	10.3	98.3%
	West	9.1	0.50	9.0	98.7%	9.1	96.7%
	Poverty	11.4	0.63	11.3	99.8%	11.4	98.6%
	Black-South	9.5	0.78	9.5	99.9%	9.7	98.8%
(3) Percent of Persons Reporting One or More Doctor Visits in the Last Year	U.S	74.1	0.36	74.2	100.1%	74.0	99.9%
	Age 65+	82.4	0.85	82.4	98.1%	82.4	98.1%
	Female	79.4	0.42	79.4	100.0%	79.4	98.1%
	Black	72.3	1.12	72.5	99.0%	72.2	94.1%
	South	73.2	0.68	73.2	97.8%	73.0	98.6%
	West	74.2	0.77	74.2	100.0%	74.1	99.9%
	Poverty	73.6	1.07	73.7	99.4%	73.6	98.6%
	Black-South	78.1	0.73	78.1	100.0%	78.2	99.0%
(4) Average Number of Doctor Visits per Person	U.S	5.5	0.14	5.5	99.2%	5.5	97.6%
	Age 65+	8.2	0.51	8.2	103.5%	8.2	102.2%
	Female	6.3	0.20	6.3	100.3%	6.3	98.4%
	Black	5.2	0.38	5.2	100.7%	5.3	102.7%
	South	5.2	0.24	5.2	99.3%	5.2	98.7%
	West	6.0	0.32	6.0	100.4%	6.0	98.5%
	Poverty	5.2	0.36	5.2	96.9%	5.2	94.0%
	Black-South	4.5	0.55	4.5	101.8%	4.6	103.4%
(5) Average Number of Bed Days per Person	U.S	5.9	0.19	5.9	99.7%	5.9	97.5%
	Age 65+	12.7	0.98	12.6	99.7%	12.9	101.6%
	Female	6.7	0.28	6.6	98.5%	6.7	98.6%
	Black	7.3	0.62	7.3	100.7%	7.5	103.3%
	South	6.2	0.36	6.2	99.8%	6.2	97.9%
	West	6.2	0.45	6.2	100.4%	6.3	104.2%
	Poverty	8.3	0.66	8.3	97.4%	8.3	96.2%
	Black-South	5.9	0.72	5.9	100.8%	6.1	106.9%
(6) Average Number of Conditions per Person	U.S	4.4	0.07	4.4	99.4%	4.4	91.2%
	Age 65+	10.0	0.26	9.9	99.0%	9.9	97.9%
	Female	4.9	0.09	4.9	99.5%	4.9	91.7%
	Black	3.8	0.16	3.8	98.3%	3.9	91.0%
	South	4.5	0.14	4.5	99.3%	4.5	96.4%
	West	4.8	0.17	4.8	100.0%	4.8	96.0%
	Poverty	5.5	0.21	5.5	99.2%	5.5	96.1%
	Black-South	3.8	0.23	3.8	97.5%	3.9	96.9%
(7) Percent of Blacks	U.S	11.4	0.56	11.0	98.0%	12.0	0.0%
	Age 65+	7.0	0.58	6.8	95.2%	8.3	0.0%
	Female	11.8	0.60	11.4	99.4%	12.4	0.0%
	South	17.5	1.14	16.5	97.5%	17.8	73.8%
	West	5.8	0.78	5.7	100.3%	6.3	105.7%
	Poverty	28.4	1.89	27.5	99.4%	29.3	83.6%
(8) Percent of Females	U.S	52.4	0.27	52.3	99.8%	51.7	0.0%
	Age 65+	58.9	0.79	58.9	101.5%	58.9	0.0%
	Black	54.3	0.82	54.3	98.7%	53.5	0.0%
	South	52.6	0.45	52.6	100.0%	51.9	82.4%
	West	51.7	0.67	51.7	98.5%	51.0	87.3%
	Poverty	58.1	0.96	58.2	101.4%	57.7	83.7%
	Black-South	53.8	1.12	53.8	97.1%	53.1	70.7%