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Subject: A.C.E. Revision II: Summary of Estimated Net Coverage

The attached document provides summary results of the Accuracy and Coverage Evaluation
(A.C.E.) Revision II estimates of net coverage along with a review of the estimation
methodology and the results of the estimation of the dual system estimate components.

Summary of Estimated Net Coverage

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Executive Summary

The Accuracy and Coverage Evaluation (A.C.E.) Revision II estimates are measures of the net coverage of the Census 2000 household population. The A.C.E. Revision II estimation method relies on Dual System Estimates (DSEs) that incorporate corrections for measurement errors detected by the A.C.E. Revision II measurement coding operation and the Further Study of Person Duplication. The estimation method is designed to handle overlap of measurement error detected by both studies in order to avoid overcorrecting for measurement error. An additional and new feature of the estimation method is that the DSEs for adult males are adjusted for estimated correlation bias.

This report provides net coverage estimates for Census 2000 based on the A.C.E. Revision II estimation methodology. Standard errors of estimates are in parentheses. Table 1 at the end of the executive summary gives percent net undercount estimates for major population groups. Here are some key findings. Statements of comparison are statistically significant at the $\alpha = 0.10$ level using a 2-sided test.

2000 A.C.E. Revision II Results

- The national A.C.E. Revision II percent net undercount estimate for Census 2000 is -0.49 (0.20). This reflects a small estimated overcount of the household population by Census 2000.

- The A.C.E. Revision II estimates that it is likely that Census 2000 experienced a small differential coverage of some major population groups, but this differential is dramatically less than that experienced in the past.

- The estimated percent net undercount for the Non-Hispanic White Domain is -1.13 (0.20), an estimated overcount of this population, while for the Non-Hispanic Black Domain, the estimate is 1.84 (0.43), an undercount of this population. Only the Non-Hispanic White and Non-Hispanic Black Domains have percent net undercount estimates significantly different from zero.

- The estimated percent net undercount for the Non-Hispanic White Domain is lower than the percent net undercount estimate for the Hispanic Domain.

- The estimated percent net undercount for Non-Hispanic Asians is lower than the Non-Hispanic Black Domain estimate.

- There are no other significant differences among the Race/Hispanic Origin Domain estimates due to sampling variation.

- The A.C.E. Revision II estimate of percent net undercount for Owners is -1.25 (0.20), reflecting an estimated overcount of this population, while for the Non-Owners, the percent net undercount estimate is 1.14 (0.36).

- Among Age/Sex groups, A.C.E. Revision II estimated statistically significant overcounts in Census 2000 of children between 10 and 17 years of age, adult females, and males 50 and over.

- A.C.E. Revision II estimated statistically significant undercounts in Census 2000 for males between 18 and 49 years of age.

2000 Results Relative to 1990

The 2000 A.C.E. Revision II estimates have been adjusted for correlation bias which is somewhat limiting when making comparisons with 1990 coverage estimates. If the 1990 Post-Enumeration Survey (PES) had been adjusted for correlation bias, the estimated undercounts would have been higher. This comparison of 2000 A.C.E. Revision II with 1990 PES will understate the differences in Census coverage between 1990 and 2000. Other methodological differences concerning the absence or presence of duplicates in either census would also affect comparisons. The extent of possible duplication in the 1990 census is not known.

Limitations

A number of assumptions were required to produce A.C.E. Revision II estimates. Some of the major issues in developing the dual system estimator were

- adjustment for correlation bias,
- adjustment for underestimation of duplicates,
- estimation of residence probability for P-Sample links,
- estimation of correct enumeration probability for E-Sample links, including duplicate links to reinstated and deleted census enumerations, and
- the use of separate E- and P- Sample post-strata.

See Kostanich (2003) for further discussion on these issues.

Table 1: Percent Net Undercount for Major Groups

	2000 A.C.E. Revision II [1]		1990 PES [2]		
Characteristic	Estimate (%)	S. E. (%)	Estimate (%)	S. E. (%)	Characteristic
Total	-0.49	0.20	1.61	0.20	Total
Race/Origin Domain					Race/Origin Domain
Non-Hispanic White	-1.13	0.20	0.68	0.22	Non-Hispanic White & Other [3]
AIAN Off Reservation	0.62	1.35			
Non-Hispanic Black	1.84	0.43	4.57	0.55	Black
Hispanic	0.71	0.44	4.99	0.82	Hispanic
Non-Hispanic Asian	-0.75	0.68	2.36	1.39	Asian or Pacific Islander [4]
Hawaiian or Pacific Isl	2.12	2.73			
AIAN On Reservation	-0.88	1.53	12.22	5.29	AIAN On Reservation
Tenure					Tenure
Owner	-1.25	0.20	0.04	0.21	Owner
Non-Owner	1.14	0.36	4.51	0.43	Non-Owner
Age/Sex					Age/Sex
0-9	-0.46	0.33	3.18	0.29	0-17 [5]
10-17	-1.32	0.41			
18-29 Male	1.12	0.63	3.30	0.54	18-29 Male
18-29 Female	-1.39	0.52	2.83	0.47	18-29 Female
30-49 Male	2.01	0.25	1.89	0.32	30-49 Male
30-49 Female	-0.60	0.25	0.88	0.25	30-49 Female
50+ Male	-0.80	0.27	-0.59	0.34	50+ Male
50+ Female	-2.53	0.27	-1.24	0.29	50+ Female

A negative estimated net undercount denotes an estimated net overcount.

[1] The A.C.E. Revsion II net undercount is for the household population.

[2] The 1990 net undercount is for the PES universe which included noninstitutional, non-military Group Quarters in addition to the household population. The results from the Committee on Adjustment of Postcensal Estimates (CAPE) are total population estimates. As a result, the 1990 estimates may differ from the CAPE results. See Bryant et al. (1992) and Thompson (1992).

[3] For 1990, American Indian off Reservation was included in the Non-Hispanic White Race/Origin Domain.

[4] For 1990, Asian or Pacific Islander was a single Race/Origin Domain.

[5] For 1990, the "0 - 17" Age/Sex group was a single group.

Methodology

The Accuracy and Coverage Evaluation (A.C.E.) Revision II estimates are measures of the net coverage of the Census 2000 household population. The A.C.E. Revision II estimation method relies on Dual System Estimates (DSEs) that incorporate corrections for measurement errors detected by the A.C.E. Revision II measurement coding operation and the Further Study of Person Duplication. The estimation method is designed to handle overlap of measurement error detected by both studies in order to avoid overcorrecting for measurement error. An additional and new feature of the estimation method is that the DSEs for adult males are adjusted for estimated correlation bias.

The general form of the dual system estimation is the data-defined census count multiplied by the ratio of the correct enumeration rate to the match rate. The correct enumeration rate is derived from the Full E sample, a sample of census enumerations. The match rate is derived from the Full P sample, an independent sample which is matched to the census. Both the correct enumeration rate and the match rate are estimated for population groups called post-strata. For A.C.E. Revision II, different sets of post-strata are used to estimate these rates. Double-sampling ratio adjustments from a subsample referred to as the Revision sample are incorporated into the Full sample to correct for error detected by the A.C.E. Revision II measurement coding operation.

For the Full E sample, correct enumeration rates are estimated for 525 post-strata based on the following characteristics: Proxy Status, Race/Hispanic Origin Domain, Tenure, Household Relationship, Household Size, Type of Census Return (Mailback vs. Non-Mailback), Date of Return (Early vs. Late), Age and Sex. When summarizing across age and sex, there are 93 Full E-sample post-stratum groups.

For the Full P sample, match rates are estimated for 480 post-strata based on these characteristics: Race/Hispanic Origin Domain, Tenure, Size of Metropolitan Statistical Area, Type of Census Enumeration Area, Tract Return Rate (Low vs. High), Region, Age, and Sex. When summarizing across age and sex, there are 64 Full P-sample post-stratum groups.

For each of the 525 Full E-sample post-strata, corrections are incorporated into the estimated correct enumeration rate to account for measurement error detected in the measurement coding operation and the Duplicate Study. Likewise, when computing the match rate for each of the 480 Full P-sample post-strata, appropriate corrections are incorporated into the match rate.

Corrections are made to the adult male post-strata for correlation bias. Correlation bias refers to the tendency for people enumerated in the census to be more likely included in the coverage survey than those missed in the census. Correlation bias usually results in a downward bias in the coverage estimates, meaning that the coverage survey does not fully account for all missed cases. Because the Census 2000 net undercount was, for the first time, close to zero, with a large number of known erroneous enumerations, it was crucial to adjust for errors going in both directions.

For a more detailed discussion of the A.C.E. Revision II methodology, see Kostanich (2003). See the Attachment for a description of the Race/Hispanic Origin Domains.

Results

Table 1 shows the estimated percent net undercount for Total, Race/Hispanic Origin Domain, Tenure, and Age/Sex groups. Table 2 shows the estimate of net undercount. Statements of comparison are statistically significant at the $\alpha = 0.10$ level using a 2-sided test. Major highlights include:

2000 A.C.E. Revision II Results

- The national A.C.E. Revision II percent net undercount estimate for Census 2000 is -0.49 (0.20). The A.C.E. Revision II estimated a small overcount of the household population by Census 2000.

- The A.C.E. Revision II estimates show differential coverage of some major population groups in Census 2000 although this differential was dramatically lower than historical measures of this differential.

- The estimated percent net undercount for the Non-Hispanic White Domain is -1.13 (0.20), an estimated overcount of this population, while for the Non-Hispanic Black Domain, the estimate is 1.84 (0.43), an undercount of this population. Only the Non-Hispanic White and Non-Hispanic Black Domains have percent net undercount estimates significantly different from zero.

- The estimated percent net undercount for the Non-Hispanic White Domain is lower than the percent net undercount estimate for the Hispanic Domain.

- The estimated percent net undercount for Non-Hispanic Asians is lower than the Non-Hispanic Black Domain estimate.

- There are no other significant differences among the Race/Hispanic Origin Domain estimates due to sampling variation.

- The A.C.E. Revision II estimate of percent net undercount for Owners is -1.25 (0.20), reflecting an overcount of this population, while for the Non-Owners, the percent net undercount estimate is 1.14 (0.36).

- Among Age/Sex groups, A.C.E. Revision II estimated statistically significant overcounts in Census 2000 of children between 10 and 17 years of age, adult females, and males 50 and over.

- A.C.E. Revision II estimated statistically significant undercounts in Census 2000 for males between 18 and 49 years of age.

Table 2: Net Undercount Estimates for Major Groups (in thousands)

2000 A.C.E. Revision II [1]			1990 PES [2]		
Characteristic	Estimate	S. E.	Estimate	S. E.	Characteristic
Total	-1,332	542	3,994	488	Total
Race/Origin Domain					Race/Origin Domain
Non-Hispanic White	-2,151	382	1,277	417	Non-Hispanic White
AIAN Off Reservation	10	21			
Non-Hispanic Black	628	146	1,389	168	Black
Hispanic	248	152	1,102	181	Hispanic
Non-Hispanic Asian	-74	67	174	103	Asian or Pacific Islander
Hawaiian or Pac Isl	13	16			
AIAN On Reservation	-5	8	52	22	AIAN On Reservation
Tenure					Tenure
Owner	-2,320	372	71	334	Owner
Non-Owner	988	310	3,871	368	Non-Owner
Age/Sex					Age/Sex
0-9	-180	130	2,084	191	0 - 17
10-17	-422	129			
18 - 29 Male	245	138	792	130	18 - 29 Male
18 - 29 Female	-295	111	687	113	18 - 29 Female
30 - 49 Male	848	104	685	114	30 - 49 Male
30 - 49 Female	-257	105	326	95	30 - 49 Female
50+ Male	-270	90	-160	93	50+ Male
50+ Female	-1,001	107	-419	98	50+ Female

A negative estimated net undercount denotes an estimated net overcount.

[1] The A.C.E. Revsion II net undercount is for the household population.

[2] The 1990 net undercount is for the PES universe which included noninstitutional, non-military Group Quarters in addition to the household population. The results from the Committee on Adjustment of Postcensal Estimates (CAPE) are total population estimates. As a result, the 1990 estimates may differ from the CAPE results. See Bryant et al. (1992) and Thompson (1992).

[3] For 1990, American Indian off Reservation was included in the Non-Hispanic White Race/Origin Domain.

[4] For 1990, Asian or Pacific Islander was a single Race/Origin Domain.

[5] For 1990, the "0 - 17" Age/Sex group was a single group.

2000 Relative to 1990

The 2000 A.C.E. Revision II estimates have been adjusted for correlation bias which is somewhat limiting when making comparisons with 1990 coverage estimates. If the 1990 Post-Enumeration Survey (PES) had been adjusted for correlation bias, the estimated undercounts would have been higher. This comparison of 2000 A.C.E. Revision II with 1990 PES will understate the differences in Census coverage between 1990 and 2000. Other methodological

differences concerning the absence or presence of duplicates in either census would also affect comparisons. The extent of possible duplication in the 1990 census is not known.

2000 Relative to Earlier Estimates

The original March 2001 A.C.E. estimates were found to be unacceptable because they failed to detect significant numbers of erroneous census enumerations. There were also suspicions that the A.C.E. may have included residents in its P sample that were actually non-resident. The Census Bureau's Executive Steering Committee for A.C.E. Policy (ESCAP) recommended twice **not** to correct the census counts. These original estimates are considered unacceptable.

In the fall of 2001, revised preliminary estimates of percent net undercount were released for three Race/Hispanic Origin Domains in Thompson et al. (2001) based on Fay (2001, 2002) methodology. This methodology was extended to other Race/Hispanic Origin Domains in Mule (2002). These preliminary results were intended to be informative about the existence of differential net coverage in Census 2000. The revised preliminary and the A.C.E. Revision II estimates both show that there is some differential coverage. Otherwise, these estimates should not be compared because any differences are a direct result of the different methodologies used. For example, the revised preliminary estimates only include corrections to the measurement of erroneous census enumerations, whereas the A.C.E. Revision II estimates also include corrections for measurement error in the match rate as well as an adjustment for correlation bias. There are many other methodological differences; however, these two alone are probably the major reasons for any differences. The A.C.E. Revision II estimates are more comprehensive than the revised preliminary estimates and reflect the Census Bureau's best estimates of the coverage of Census 2000.

Components of the DSE

Table 3 shows the estimated census inclusion rates for the 64 Full P-sample post-stratum groups. The census inclusion rate is an estimate of the proportion of the true population included in the census. This rate reflects the P-sample match rate and the effect of correcting for correlation bias. Generally, census inclusion rates are higher for Owners than for Non-Owners. In addition, census inclusion rates are higher for people who are associated with high return rate tracts instead of low return rate tracts. Table 4 gives the corresponding standard errors of the census inclusion rate while Table 5 provides census counts of the household population for the 64 Full P-sample post-stratum groups.

Table 6 shows the estimated census correct enumeration rates for the 93 Full E-sample post-stratum groups. Note that the estimated census correct enumeration rates are not the same as the E-sample correct enumeration rates. See Bell (2002) for details. Generally, census correct enumeration rates are higher for Mailback groups than for Non-Mailback groups and higher for early returns than late returns. Typically, the Late Non-Mailback post-stratum groups have the lowest correct enumeration rates among these four groups. Most notable, though, is the low estimated correct enumeration rates for the Proxy post-stratum groups. Proxy status appears to be a good discriminator for correct enumerations. It is important to note that there is no

corresponding Proxy variable in the Full P-sample post-stratification. The census inclusion rate of proxy enumerations is not known. The resulting net coverage estimates for proxy enumerations borrow the census inclusion rates for associated P-sample post-strata, which one can hypothesize may be too high. This fact is not known.

Table 7 shows the corresponding standard errors of the census correct enumeration rates. Table 8 provides census counts of the household population for the 93 Full E-sample post-stratum groups.

Table 9 shows A.C.E. Revision II net coverage estimates and estimated components for major population groups. These estimates include the percent net undercount, the census data-defined rate, the census correct enumeration rate, the census inclusion rate, the match rate, and the standard error of the percent net undercount. As mentioned earlier, the census inclusion rate is the match rate that incorporates the correlation bias adjustment. Note that for children and females, the census inclusion rate and the match rate are the same since these groups are not adjusted for correlation bias.

Table 3: 64 A.C.E. Revision II Full P-Sample Post-Stratum Groups - Census Inclusion Rates (%)

Race/Hispanic Origin Domain Number*	Tenure	MSA/TEA	High Return Rate				Low Return Rate			
			NE	MW	S	W	NE	MW	S	W
Domain 7 (Non-Hispanic White or "Some other race")	Owner	Large MSA MO/MB	95.30	96.32	95.19	95.12	92.81	94.28	92.20	92.39
		Medium MSA MO/MB	96.28	97.01	94.90	95.68	97.16	94.59	93.33	91.11
		Small MSA & Non-MSA MO/MB	95.98	96.06	95.35	95.73	93.14	90.92	92.26	91.41
		All Other TEAs	92.90	96.00	92.94	91.26	92.05	93.32	91.96	89.03
	Non-Owner	Large MSA MO/MB	89.10				85.39			
		Medium MSA MO/MB	89.51				85.17			
		Small MSA & Non-MSA MO/MB	89.65				85.19			
		All Other TEAs	88.32				83.19			
Domain 4 (Non-Hispanic Black)	Owner	Large MSA MO/MB	89.25				84.91			
		Medium MSA MO/MB								
		Small MSA & Non-MSA MO/MB	89.07				86.87			
		All Other TEAs								
	Non-Owner	Large MSA MO/MB	82.38				79.01			
		Medium MSA MO/MB								
		Small MSA & Non-MSA MO/MB	83.99				84.78			
		All Other TEAs								
Domain 3 (Hispanic)	Owner	Large MSA MO/MB	92.10				88.01			
		Medium MSA MO/MB								
		Small MSA & Non-MSA MO/MB	90.87				88.83			
		All Other TEAs								
	Non-Owner	Large MSA MO/MB	86.44				80.72			
		Medium MSA MO/MB								
		Small MSA & Non-MSA MO/MB	83.53				75.91			
		All Other TEAs								
Domain 5 (Native Hawaiian or Pacific Islander)	Owner		87.15							
	Non-Owner		83.27							
Domain 6 (Non-Hispanic Asian)	Owner		92.32							
	Non-Owner		87.07							
American Indian or Alaska Native — Domain 1 (On Reservation)	Owner		86.13							
	Non-Owner		87.14							
American Indian or Alaska Native — Domain 2 (Off Reservation)	Owner		90.54							
	Non-Owner		84.25							

*   For Census 2000, persons can self-identify with more than one race group. For post-stratification purposes, persons are included in a single Race/Hispanic Origin Domain. This classification does not change a person's actual response. Further, all official tabulations are based on actual responses to the census.

Table 4: 64 A.C.E. Revision II Full P-Sample Post-Stratum Groups - Census Inclusion Rate Standard Errors (%)

Race/Hispanic Origin Domain Number*	Tenure	MSA/TEA	High Return Rate				Low Return Rate			
			NE	MW	S	W	NE	MW	S	W
Domain 7 (Non-Hispanic White or "Some other race")	Owner	Large MSA MO/MB	0.97	1.08	0.73	0.63	1.09	1.33	1.73	1.92
		Medium MSA MO/MB	1.08	0.88	0.51	0.46	1.40	0.85	1.28	2.69
		Small MSA & Non-MSA MO/MB	1.04	0.74	1.21	0.90	3.86	2.46	1.18	1.41
		All Other TEAs	1.20	1.02	1.13	1.86	2.21	1.09	0.90	1.65
	Non-Owner	Large MSA MO/MB	0.98				1.08			
		Medium MSA MO/MB	0.98				1.32			
		Small MSA & Non-MSA MO/MB	0.89				1.13			
		All Other TEAs	0.86				1.66			
Domain 4 (Non-Hispanic Black)	Owner	Large MSA MO/MB	0.51				1.22			
		Medium MSA MO/MB								
		Small MSA & Non-MSA MO/MB	0.77				1.73			
		All Other TEAs								
	Non-Owner	Large MSA MO/MB	0.79				0.94			
		Medium MSA MO/MB								
		Small MSA & Non-MSA MO/MB	1.16				1.80			
		All Other TEAs								
Domain 3 (Hispanic)	Owner	Large MSA MO/MB	0.47				1.36			
		Medium MSA MO/MB								
		Small MSA & Non-MSA MO/MB	1.04				1.84			
		All Other TEAs								
	Non-Owner	Large MSA MO/MB	0.77				1.27			
		Medium MSA MO/MB								
		Small MSA & Non-MSA MO/MB	1.42				3.37			
		All Other TEAs								
Domain 5 (Native Hawaiian or Pacific Islander)	Owner		3.46							
	Non-Owner		3.05							
Domain 6 (Non-Hispanic Asian)	Owner		1.21							
	Non-Owner		0.82							
American Indian or Alaska Native — **Domain 1** (On Reservation)	Owner		1.39							
	Non-Owner		1.38							
Domain 2 (Off Reservation)	Owner		1.66							
	Non-Owner		1.75							

* For Census 2000, persons can self-identify with more than one race group. For post-stratification purposes, persons are included in a single Race/Hispanic Origin Domain. This classification does not change a person's actual response. Further, all official tabulations are based on actual responses to the census.

Table 5: 64 A.C.E. Revision II Full P-Sample Post-Stratum Groups - Census Household Population (Millions)

Race/Hispanic Origin Domain Number*	Tenure	MSA/TEA	High Return Rate				Low Return Rate			
			NE	MW	S	W	NE	MW	S	W
Domain 7 (Non-Hispanic White or "Some other race")	Owner	Large MSA MO/MB	11.5	6.8	5.3	5.8	3.0	0.7	1.5	0.9
		Medium MSA MO/MB	5.6	11.7	11.9	8.2	0.5	1.2	3.6	2.3
		Small MSA & Non-MSA MO/MB	2.9	11.4	7.9	3.6	0.4	0.9	3.4	1.5
		All Other TEAs	4.1	6.9	5.0	1.8	1.4	1.1	11.9	2.3
	Non-Owner	Large MSA MO/MB	8.5				3.8			
		Medium MSA MO/MB	11.5				3.1			
		Small MSA & Non-MSA MO/MB	9.4				2.1			
		All Other TEAs	5.0				2.5			
Domain 4 (Non-Hispanic Black)	Owner	Large MSA MO/MB	8.5				2.8			
		Medium MSA MO/MB								
		Small MSA & Non-MSA MO/MB	3.9				1.3			
		All Other TEAs								
	Non-Owner	Large MSA MO/MB	9.2				3.7			
		Medium MSA MO/MB								
		Small MSA & Non-MSA MO/MB	3.5				0.5			
		All Other TEAs								
Domain 3 (Hispanic)	Owner	Large MSA MO/MB	9.7				2.5			
		Medium MSA MO/MB								
		Small MSA & Non-MSA MO/MB	2.9				1.7			
		All Other TEAs								
	Non-Owner	Large MSA MO/MB	10.7				3.8			
		Medium MSA MO/MB								
		Small MSA & Non-MSA MO/MB	2.6				0.7			
		All Other TEAs								
Domain 5 (Native Hawaiian or Pacific Islander)	Owner		0.3							
	Non-Owner		0.3							
Domain 6 (Non-Hispanic Asian)	Owner		6.0							
	Non-Owner		3.9							
American Indian or Alaska Native — **Domain 1** (On Reservation)	Owner		0.4							
	Non-Owner		0.2							
American Indian or Alaska Native — **Domain 2** (Off Reservation)	Owner		0.9							
	Non-Owner		0.6							

*   For Census 2000, persons can self-identify with more than one race group. For post-stratification purposes, persons are included in a single Race/Hispanic Origin Domain. This classification does not change a person's actual response. Further, all official tabulations are based on actual responses to the census.

•   Numbers may not add due to rounding.

Table 6: 93 A.C.E. Revision II Full E-Sample Post-Stratum Groups - Census Correct Enumeration Rates (%)

Race/Hispanic Origin Domain*		Tenure	Relationship	HH Size	Early Mail-back	Late Mail-back	Early Non-Mailback	Late Non-Mailback
Domain 7 PROXY Non-Hispanic White or SOR					61.14			
Domain 4 PROXY Non-Hispanic Black					57.61			
Domain 3 PROXY Hispanic					59.18			
Domain 5 PROXY Native Hawaiian or Pacific Islander					63.25			
Domain 6 PROXY Non-Hispanic Asian					59.24			
Domain 1 PROXY AI or AN On Reservation					80.50			
Domain 2 PROXY AI or AN Off Reservation					72.59			
Domain 7 Non-Hispanic White or Some other race		Owner	HHer/Nuclear	2-3	97.33	96.22	94.33	90.26
				4+	97.97	97.09	96.15	93.17
			Other	1	95.67	93.90	91.70	87.21
				2-3	92.03	91.57	90.48	87.77
				4+	89.78	89.59	88.73	87.88
		Non-Owner	HHer/Nuclear		95.93	95.02	93.12	89.97
			Other		92.70	91.67	89.64	86.40
Domain 4 Non-Hispanic Black		Owner	HHer/Nuclear		96.62	95.40	93.73	90.96
			Other		90.87	90.54	89.56	86.85
		Non-Owner	HHer/Nuclear		94.75	93.79	92.69	89.12
			Other		90.11	89.02	89.34	84.57
Domain 3 Hispanic		Owner	HHer/Nuclear		97.68	96.98	95.20	91.60
			Other		92.88	91.82	88.90	88.42
		Non-Owner	HHer/Nuclear		96.12	95.29	92.84	89.50
			Other		90.83	90.40	86.16	84.85
Domain 5 Native Hawaiian or Pacific Islander		Owner & Non-Owner	HHer/Nuclear		97.32	93.92	93.05	92.16
			Other		89.05	86.94	86.05	88.05
Domain 6 Non-Hispanic Asian		Owner & Non-Owner	HHer/Nuclear		97.34	95.65	92.35	90.95
			Other		90.98	90.13	86.51	86.10
American Indian or Alaska Native	**Domain 1** On Reservation	Owner & Non-Owner	HHer/Nuclear		93.02			
			Other		88.71			
	Domain 2 Off Reservation	Owner & Non-Owner	HHer/Nuclear		97.10	93.91	94.11	90.50
			Other		88.93	87.70	89.59	84.08

* For Census 2000, persons can self-identify with more than one race group. For post-stratification purposes, persons are included in a single Race/Hispanic Origin Domain. This classification does not change a person's actual response. Further, all official tabulations are based on actual responses to the census.

Table 7: 93 A.C.E. Revision II Full E-Sample Post-Stratum Groups -
Census Correct Enumeration Rate Standard Error (%)

Race/Hispanic Origin Domain*		Tenure	Relationship	HH Size	Early Mail-back	Late Mail-back	Early Non-Mailback	Late Non-Mailback
Domain 7 PROXY Non-Hispanic White or SOR					1.08			
Domain 4 PROXY Non-Hispanic Black					1.57			
Domain 3 PROXY Hispanic					1.88			
Domain 5 PROXY Native Hawaiian or Pacific Islander					13.41			
Domain 6 PROXY Non-Hispanic Asian					3.78			
Domain 1 PROXY AI or AN On Reservation					3.20			
Domain 2 PROXY AI or AN Off Reservation					5.97			
Domain 7 Non-Hispanic White or Some other race		Owner	HHer/Nuclear	2-3	0.56	0.97	0.89	0.66
				4+	0.92	0.57	1.02	1.06
			Other	1	0.93	0.82	0.91	1.15
				2-3	0.61	0.80	0.98	1.02
				4+	0.90	0.92	1.52	1.40
		Non-Owner	HHer/Nuclear		0.59	0.41	0.71	0.64
			Other		0.58	0.48	1.21	0.59
Domain 4 Non-Hispanic Black		Owner	HHer/Nuclear		1.09	0.62	1.28	0.83
			Other		0.68	0.67	0.99	1.23
		Non-Owner	HHer/Nuclear		0.90	1.03	1.16	0.82
			Other		0.71	1.04	1.31	0.88
Domain 3 Hispanic		Owner	HHer/Nuclear		0.77	0.61	0.85	1.11
			Other		0.95	0.68	1.28	1.38
		Non-Owner	HHer/Nuclear		1.08	1.16	0.82	0.79
			Other		0.65	0.61	1.27	1.10
Domain 5 Native Hawaiian or Pacific Islander		Owner & Non-Owner	HHer/Nuclear		0.73	1.82	2.81	2.05
			Other		2.38	3.10	3.78	2.97
Domain 6 Non-Hispanic Asian		Owner & Non-Owner	HHer/Nuclear		0.59	1.20	1.11	0.99
			Other		1.13	1.18	2.19	1.61
American Indian or Alaska Native	**Domain 1** On Reservation	Owner & Non-Owner	HHer/Nuclear		1.01			
			Other		1.10			
	Domain 2 Off Reservation	Owner & Non-Owner	HHer/Nuclear		1.18	1.48	2.05	1.92
			Other		1.80	2.08	2.60	2.92

*   For Census 2000, persons can self-identify with more than one race group. For post-stratification purposes, persons are included in a single Race/Hispanic Origin Domain. This classification does not change a person's actual response. Further, all official tabulations are based on actual responses to the census.

Table 8: 93 A.C.E. Revision II Full E Sample Post-Stratum Groups -
Census Household Population (Millions)

Race/Hispanic Origin Domain*		Tenure	Relationship	HH Size	Early Mail-back	Late Mail-back	Early Non-Mailback	Late Non-Mailback
Domain 7 PROXY Non-Hispanic White or SOR					4.8			
Domain 4 PROXY Non-Hispanic Black					1.4			
Domain 3 PROXY Hispanic					0.9			
Domain 5 PROXY Native Hawaiian or Pacific Islander					0.02			
Domain 6 PROXY Non-Hispanic Asian					0.2			
Domain 1 PROXY AI or AN On Reservation					0.02			
Domain 2 PROXY AI or AN Off Reservation					0.04			
Domain 7 Non-Hispanic White or Some other race		Owner	HHer/Nuclear	2-3	34.0	19.8	3.5	4.7
				4+	24.7	18.0	3.3	5.5
			Other	1	6.5	3.6	0.7	1.0
				2-3	4.7	3.1	0.7	0.9
				4+	4.4	3.6	0.7	1.3
		Non-Owner	HHer/Nuclear		10.9	8.0	3.3	4.9
			Other		6.7	4.8	1.9	2.9
Domain 4 Non-Hispanic Black		Owner	HHer/Nuclear		3.4	4.2	0.9	1.9
			Other		1.8	2.4	0.5	1.1
		Non-Owner	HHer/Nuclear		2.7	3.2	1.5	3.0
			Other		1.5	1.8	0.7	1.5
Domain 3 Hispanic		Owner	HHer/Nuclear		4.0	4.7	1.1	1.7
			Other		1.7	2.2	0.4	0.8
		Non-Owner	HHer/Nuclear		2.9	4.3	1.5	2.7
			Other		1.3	2.2	0.7	1.5
Domain 5 Native Hawaiian or Pacific Islander		Owner & Non-Owner	HHer/Nuclear		0.1	0.1	0.05	0.09
			Other		0.07	0.05	0.02	0.06
Domain 6 Non-Hispanic Asian		Owner & Non-Owner	HHer/Nuclear		2.8	2.5	0.6	0.9
			Other		1.1	1.1	0.3	0.5
American Indian or Alaska Native	**Domain 1** On Reservation	Owner & Non-Owner	HHer/Nuclear		0.3			
			Other		0.2			
	Domain 2 Off Reservation	Owner & Non-Owner	HHer/Nuclear		0.4	0.4	0.1	0.2
			Other		0.1	0.2	0.06	0.09

*   For Census 2000, persons can self-identify with more than one race group. For post-stratification purposes, persons are included in a single Race/Hispanic Origin Domain. This classification does not change a person's actual response. Further, all official tabulations are based on actual responses to the census

•   Numbers may not add due to rounding.

Table 9: A.C.E. Revision II Net Coverage Estimates for Major Groups

Characteristic	Net Undercount (%)	Data-Defined Rate (%)	Correct Enumeration Rate (%)	Census Inclusion Rate (%)	Match Rate (%)	SE (Net Undercount) (%)
Total	-0.49	97.07	93.48	91.19	91.76	0.20
Race/Origin Domain						
Non-Hispanic White	-1.13	97.70	94.19	93.06	93.43	0.20
Non-Hispanic Black	1.84	95.65	90.61	85.08	87.13	0.43
Hispanic	0.71	95.21	92.56	87.50	87.76	0.44
Hawaiian or Pacific Isl	2.12	95.41	91.29	85.25	85.52	2.73
Non-Hispanic Asian	-0.75	96.49	92.80	90.22	90.55	0.68
AIAN On Reservation	-0.88	94.13	91.04	86.45	86.69	1.53
AIAN Off Reservation	0.62	96.24	91.88	87.88	88.16	1.35
Tenure						
Owner	-1.25	97.61	94.72	93.61	94.16	0.20
Non-Owner	1.14	95.90	90.73	86.02	86.62	0.36
Age/Sex						
0-9	-0.46	95.68	93.94	90.30	90.30	0.33
10-17	-1.32	96.39	94.32	92.12	92.12	0.41
18-29 Male	1.12	96.35	89.79	85.54	86.36	0.63
18-29 Female	-1.39	96.54	90.34	88.43	88.43	0.52
30-49 Male	2.01	97.47	93.61	89.40	91.63	0.25
30-49 Female	-0.60	97.63	94.92	93.22	93.22	0.25
50+ Male	-0.80	97.96	93.79	92.62	93.94	0.27
50+ Female	-2.53	97.92	94.07	94.44	94.44	0.27

Net Undercount is for household population.
A negative net undercount denotes a net overcount.

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Computing Net Coverage Estimates and Related Statistics

Here are the basic formulas for computing coverage-related statistics.

Dual System Estimate

The general form of the dual system estimator is the census count multiplied by the data-defined rate, which is then multiplied by the ratio of the correct enumeration rate to the match rate. The correct enumeration rate and the match rate are determined using different sets of post-strata. The DSE is the estimate of the household population.

$$DSE_{ij} = Cen_{ij} \times r_{DD,ij} \times \frac{r_{CE,i}}{\tilde{r}_{M,j}}$$

where

i and j	represent the post-strata used to calculate the correct enumeration rate and match rate, respectively.
Cen_{ij}	is the census count of the household population in the cross-classification of post-strata i and j. Includes late adds.
$r_{DD,ij}$	is the data-defined rate for the cross-classification of post-strata i and j. Includes late adds in the denominator and excludes late adds in the numerator.
$r_{CE,i}$	is the correct enumeration rate for the E-sample post-stratum i,
$\tilde{r}_{M,j}$	is the match rate for the P-sample post-stratum j that has been corrected for correlation bias.

Note that the ij cross-classification of post-strata actually are expanded to reflect the detailed Age/Sex groups.

Only the match rates for adult males, except for Nonblack males between the ages of 18 and 29, have been corrected for correlation bias. A match rate including a correction for correlation bias is referred to as the census inclusion rate.

The post-stratum subscripts are omitted in subsequent formulae.

Percent Net Undercount

The percent net undercount (UC) is the estimated net undercount (or net overcount) divided by the dual system estimate expressed as a percentage. A positive number implies undercoverage while a negative number implies overcoverage. The percent net undercount for Census 2000 shown in this document is strictly for the household population which excludes Group Quarters persons. Also, people in Remote Alaska are excluded.

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$$UC = \frac{(DSE - Cen)}{DSE} \times 100$$

Percent Net Undercount Standard Error

The standard errors for percent net undercount estimates in this report were direct computations using a jack-knife replication methodology. The formula for approximating the standard error is

$$SE(UC) = (100 - UC)\frac{\sqrt{Var(DSE)}}{DSE}$$

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Race/Hispanic Origin Domains

The Race/Hispanic Origin Domain assignment generally follows the guidelines listed below, but it is essential to see Haines (2001) for the complete set of rules used to classify people into one of the seven Domains. The Race/Hispanic Origin Domain assignment is hierarchical.

Domain 1 (American Indian or Alaska Native on reservations) includes:

All people on a reservation with American Indian or Alaska Native either as their single race or as one of multiple races, regardless of their Hispanic origin.

Domain 2 (American Indian or Alaska Native off reservations) includes:

All people in Indian Country[1] but not on a reservation with American Indian or Alaska Native either as their single race or as one of multiple races, regardless of their Hispanic origin.

All Non-Hispanic people not in Indian Country with American Indian or Alaska Native as their single race.

Domain 3 (Hispanic) includes:

All Hispanic people in Indian Country, excluding those with American Indian or Alaska Native either as their single race or as one of multiple races.

All Hispanic people not in Indian Country, excluding those who live in the state of Hawaii and have Native Hawaiian or Pacific Islander as a single race or as one of multiple races.

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[1] Indian Country is land considered (either wholly or partially) on an American Indian reservation/trust land, Tribal Jurisdiction Statistical Area, Tribal Designated Statistical Area, or Alaska Native Village Statistical Area. For Census 2000, Tribal Jurisdiction Statistical Area has been formally renamed as Oklahoma Tribal Statistical Area.

Domain 4 (Non-Hispanic Black) includes:

All Non-Hispanic people with Black as their only race.

All Non-Hispanic people with the race combination of Black and American Indian or Alaska Native who do not live in Indian Country.

All people with the race combination of Black and another single race group (Native Hawaiian or Pacific Islander, Asian, White, or "Some other race"), excluding those who live in the state of Hawaii and are Native Hawaiian or Pacific Islander in addition to Black.

Domain 5 (Native Hawaiian or Pacific Islander) includes:

All Non-Hispanic people with the single race Native Hawaiian or Pacific Islander.

All Non-Hispanic people with the race combination of Native Hawaiian or Pacific Islander and American Indian or Alaska Native who do not live in Indian Country.

All Non-Hispanic people with the race combination of Native Hawaiian or Pacific Islander and Asian.

All people living in the state of Hawaii with Native Hawaiian or Pacific Islander race, regardless of their Hispanic origin and whether they identify with a single race or multiple races.

Domain 6 (Non-Hispanic Asian) includes:

All Non-Hispanic people with Asian as their single race.

All people with the race combination of Asian and American Indian or Alaska Native who do not live in Indian Country.

Domain 7 (Non-Hispanic White or "Some other race") includes:

\#   All Non-Hispanic people self-identifying as either White or "Some other race" as their single race, or self-identifying as both White and "Some other race."

\#   All Non-Hispanic people with the race combination of American Indian or Alaska Native and White or "Some other race" who do not live in Indian Country.

\#   All Non-Hispanic people with the race combinations of Asian and White or "Some other race."

\#   All Non-Hispanic people with the race combination of Native Hawaiian or Pacific Islander and White or "Some other race," excluding those who live in the state of Hawaii.

\#   All Non-Hispanic people with three or more races who live in Indian Country, excluding those with American Indian or Alaska Native as one of the races.

\#   All Non-Hispanic people with three or more races and who do not live in Indian Country, excluding those who live in Hawaii and have Native Hawaiian or Pacific Islander as one of the races.