Analysis of Conflicting Households

FINAL REPORT

This evaluation reports the results of research and analysis undertaken by the U.S. Census Bureau. It is part of a broad program, the Census 2000 Testing, Experimentation, and Evaluation (TXE) Program, designed to assess Census 2000 and to inform 2010 Census planning. Findings from the Census 2000 TXE Program reports are integrated into topic reports that provide context and background for broader interpretation of results.

Xijian Jim Liu
Roxanne Feldpausch
Damon Smith

Decennial Statistical
Studies Division

U S C E N S U S B U R E A U

Helping You Make Informed Decisions

CONTENTS

LIST OF TABLES

EXECUTIVE SUMMARY

The Accuracy and Coverage Evaluation measures the overall and differential coverage of the United States population in Census 2000. The major steps of the Accuracy and Coverage Evaluation are housing unit matching and person matching. In this evaluation, we investigate conflicting households. A household is defined as the person or group of persons who live in a housing unit. We refer to those people listed in the Accuracy and Coverage Evaluation at an address or housing unit as the Accuracy and Coverage Evaluation household for that unit and to the people listed in the census at an address or housing unit as the census household for that unit. A conflicting household refers to the people at a matched, non-vacant address or individual housing unit, where the Accuracy Coverage Evaluation household and census household do not contain any matched or possibly matched person. There are also conflicting household addresses. These addresses refer to the housing unit that contains a conflicting household.

After the before followup person matching, initial conflicting households were identified (based on preliminary housing unit matching results and before followup person matching results) and were sent to person followup. This evaluation focuses on final conflicting households that were identified after all person matching and housing unit matching were completed. The main difference is the use of the final housing unit matching results that processed the units not in the initial housing unit matching, such as addresses added to the census after January 2000, addresses in the list/enumerate areas, and addresses in relist clusters. Using the final housing unit matching results may also change some of the initial housing unit match links.

There are 4,369 final conflicting household addresses in the Accuracy and Coverage Evaluation sample for the United States. Persons in these final conflicting households accounted for 1.2 percent of the Accuracy and Coverage Evaluation sample and 1.3 percent of the Enumeration sample (a sample of people enumerated in the census).

The Accuracy and Coverage Evaluation interview errors can be determined by the number of survey nonresidents and the census interview errors can be determined by the number of erroneous enumerations. Unresolved cases could also be an indication of potential interview errors. A higher degree of census enumeration errors than Accuracy and Coverage Evaluation interview errors are evidenced in conflicting households. In conflicting households,
- The percent of Enumeration sample people coded as confirmed erroneous enumerations is higher than the percent of the Accuracy and Coverage Evaluation sample people coded as confirmed nonresidents (26.9 percent vs. 5.1 percent);
- The percent of Accuracy and Coverage Evaluation sample people having unresolved status is higher than that of Enumeration sample people having unresolved status (30.4 percent vs. 26.3 percent);
- People from conflicting households have a significantly higher unresolved rate (30.4 percent for the Accuracy and Coverage Evaluation sample and 26.3 percent for the census sample) than people in matched (1.8 and 1.5 percent respectively) and not matched (3.7 and 10.8 percent) housing units.

- Including imputation for unresolved residency and enumeration status, the estimated number of Enumeration sample erroneous enumerations is larger than the number of nonresidents among the Accuracy and Coverage Evaluation persons (1,355,026 vs. 436,900).

Among the conflicting household addresses,

- There are more Enumeration sample whole household erroneous enumerations (1,057) than Accuracy and Coverage Evaluation whole household nonresidents (646);
- There are similar numbers of Accuracy and Coverage Evaluation addresses of whole household unresolved (1,132) and census addresses of whole household unresolved (1,070).
- The followup interviews indicate that for 1,302 addresses it was the Accuracy and Coverage Evaluation household rather than the census household that lived at the sample address on Census Day. For the opposite scenario, there were 688 addresses where the census household and not the Accuracy and Coverage Evaluation household lived at the sample address on Census Day.

For the different characteristic groupings studied, the groups that have higher rates of conflicting households than their counterparts are renters, Hispanics, Blacks, people of age 18-29, males of age 30-49, and households in multi-unit structures.

1. BACKGROUND

The Accuracy and Coverage Evaluation (A.C.E.) measures the overall and differential coverage of the United States population in Census 2000. The major steps of the A.C.E. are housing unit (HU) matching and person matching. During the preliminary housing unit operation, housing units within the sample cluster were listed and matched to the January 2000 version of the decennial master address file (DMAF). If an A.C.E. address and an address in the DMAF were matched or matched with unresolved housing unit status, a housing unit link was established. In this evaluation, we investigate conflicting households. A household is defined as the person or group of persons who live in a housing unit. We refer to those people listed in the A.C.E. at an address or housing unit as the A.C.E. household for that unit and to the people listed in the census at an address or housing unit as the census household for that unit. A conflicting household refers to the people at a matched, non-vacant address or individual housing unit, where the A.C.E. household and census household do not contain any matched or possibly matched person. The address or housing unit that contain conflicting households are also conflicting. These addresses are called conflicting household addresses.

The A.C.E. sample person data were obtained from A.C.E. person interview results and census persons data were obtained from the Hundred Percent Census Unedited Files (HCUF) for the addresses. During before followup person matching, A.C.E. sample persons were matched to the people enumerated in the census. If the A.C.E. and the census had whole households of nonmatch people at a matched address, these households were identified as initial conflicting households and were sent to Person Followup (PFU) interview to gather additional information to correctly code their residence status and enumeration status. Final person match codes were assigned during after followup coding according to information obtained from PFU. Later, during the final housing unit operation some of the results from the initial housing unit operation were verified. Addresses that were added to the DMAF after January 2000 as well as addresses in list/enumerate clusters and relist clusters were matched for the first time during the final housing unit matching operation.

In this project, we investigate conflicting households. A conflicting household refers to the situation mentioned above where the people in the A.C.E. household are different from the people in the census household at a matched address. In other words, the people in this housing unit are conflicting. These cases have been referred to as the Smith/Jones cases in the past. This evaluation analyzes final conflicting households identified after all person matching and housing unit matching were completed, that is, after the final housing unit match operation. Using data from the final housing unit (FHU) match operation benefits the analysis because FHU processes the units not in the initial housing unit match, such as addresses added to the census after January 2000, addresses in the list/enumerate areas, and addresses in relist clusters. In addition, the final housing unit operation may have resulted in changes to the housing unit match links when compared to the initial phase. (See also Table A-1 in the Appendix).

1

2. METHODS

Households

A household is defined as the person or group of persons who live in a housing unit. We refer to those people listed in A.C.E. at an address or housing unit as the A.C.E. household for that unit and to the people listed in census at an address or housing unit as the census household for that unit.

Conflicting households

A conflicting household refers to the people at a matched, non-vacant address or individual housing unit, where the A.C.E. household and census household do not contain any matched or possibly matched person. There is a conflict because the A.C.E. contains one household and the census contains another household. These cases have been referred to as "Smith/Jones" households in the past, because the Smith's are in the A.C.E. and the Jones's are in the census at the same address.

Conflicting household addresses

Conflicting household addresses refer to the housing units that contain conflicting households. There were 4,369 conflicting household addresses in the A.C.E. sample.

Initial conflicting households and final conflicting households

Conflicting households sent to person followup were identified at the end of the before followup person matching. They are defined based on before followup person matching results and preliminary housing unit matching results. They are called initial conflicting households.

The conflicting households investigated in this evaluation are those identified after all person matching and housing unit matching were completed. They are defined based on results of after followup person matching and final housing unit matching. Final housing unit matching may change the initial housing unit match links, and includes some addresses that were not in the initial housing unit matching, such as addresses added to the census inventory after January 2000, addresses in list/enumerate areas, and addresses in relist clusters.

The weights used in this evaluation

For person counts, we include all A.C.E. sample and Enumeration sample or E-sample (a sample of people enumerated in the census) persons in person matching. Person results are weighted using weights that reflect the probability of selection in all stages of sampling. A.C.E. sample weights also reflect noninterview adjustment. Standard errors are computed using stratified Jackknife method via VPLX. Housing unit results are unweighted.

Analyzing conflicting households

In this evaluation we investigate

- The interview errors related to conflicting households;
- The characteristics of conflicting household addresses and people.

Census interview errors can be measured by the E-sample erroneous enumerations. A.C.E. interview errors can be measured by the nonresidents that were removed from the A.C.E. sample. Cases with unresolved status in which the followup interview did not collect enough information to determine the residence status and enumeration status, also provide a measure of potential interview errors.

We also tabulate the distribution of conflicting households by selected variables such as type of enumeration area, tenure, type of basic address, race domain, and age and gender groupings.

3. LIMITS

The following issues and errors are beyond the scope of this report:

- Errors in coding matching status and residence status,
- Errors in data keying,
- Errors due to nonresponse,
- Response errors,
- Imputation errors,
- Correlation bias,
- Other errors.

This analysis is for the fifty states in the U.S. and the District of Columbia only.

4. RESULTS

In the 2000 A.C.E., there were 4,369 addresses that were identified as final conflicting households after all A.C.E. operations were completed. Persons in these final conflicting households consisted of 1.2 percent of the A.C.E. sample and 1.3 percent of the enumeration sample or E-sample.

Table 1 presents details on the composition of final conflicting households.

Table 1. Final Conflicting Households in the 2000 Accuracy and Coverage Evaluation

	A.C.E. Sample	E-sample
Number of conflicting household addresses	4 ,369	4,369
Weighted number of people in conflicting household addresses	3,085,165	3,547,750
Percent of conflicting persons in A.C.E. sample/E-sample	1.2%	1.3%
Weighted estimate of residents/correct enum.	2,648,265	2,192,724
Confirmed resident/correct enumeration	*1,992,526*	*1,661,209*
Imputed from unresolved status	*655,739*	*531,515*
Weighted estimate of nonresidents/erroneous enumeration	436,900	1,355,026
Confirmed nonresident/erroneous enumeration	*156,732*	*955,258*
Imputed from unresolved status	*280,168*	*399,768*

4.1 How are interview errors related to conflicting households?

4.1.1 What are the percent nonresidents and percent unresolved for A.C.E. persons in conflicting households? What are the percent erroneous enumeration and percent unresolved for the census persons in conflicting households?

In conflicting households,

- The percent of E-sample persons having confirmed erroneous enumerations status (26.9 percent, standard error = 1.08 percent) is much higher than the percent of A.C.E. persons who are confirmed nonresidents (5.1 percent, standard error = 0.42 percent).
- The total percent of A.C.E. persons having unresolved residence status (30.3 percent, standard error = 1.19 percent) is slightly higher than the total percent of E-sample persons having unresolved status (26.3 percent, standard error = 1.03 percent). These percentages are

4

not statistically different.
- The number of erroneous enumerations in the E-sample (955,259, standard error = 46,491) is more than the number of nonresidents in the A.C.E. sample (156,732, standard error = 13,710).

Table 2 shows the nonresident and unresolved residence status for the A.C.E. sample persons as well as the erroneous enumeration and unresolved enumeration status in the E-sample by housing unit match status. The bases of the percentages shown are A.C.E. sample persons or E-sample persons in the row category.

The unresolved rate of people in conflicting households are significantly higher (30.4 percent for A.C.E. sample and 26.3 percent for E-sample) than the unresolved rates in housing units matched (1.8 percent for A.C.E. sample and 1.5 percent for E-sample) and housing units not matched (3.7 percent for A.C.E. sample and 10.8 percent for E-sample).

Table 2. Percent of Sample Persons with Nonresident, Erroneous Enumeration and Unresolved Status (standard error)

Final Housing Unit Match Status	A.C.E. Sample			E-sample		
	Non-residents	Unresolved with High Prob. of Nonresident	Other unresolved	Erroneous Enumeration	Unresolved with High Prob. of Err. Enum.	Other Unresolved
Housing unit matched	0.9 (0.02)	0.2 (0.01)	1.6 (0.04)	3.0 (0.04)	0.4 (0.02)	1.1 (0.04)
Housing unit not matched	1.7 (0.18)	0.5 (0.11)	3.2 (0.26)	13.0 (0.60)	1.2 (0.10)	9.6 (0.79)
Conflicting household	5.1 (0.42)	8.7 (0.58)	21.7 (1.06)	26.9 (1.08)	12.5 (0.78)	13.8 (0.76)
Total	**0.9 (0.02)**	**0.3 (0.01)**	**1.9 (0.04)**	**4.1 (0.07)**	**0.6 (0.02)**	**2.0 (0.08)**

Table 3 shows the different types of erroneous enumeration by housing unit match status. The bases of the percents shown are E-sample persons in the row category. Among people in the conflicting households in the E-sample, there are 9.3 percent fictitious, 7.6 percent other residence, and 6.6 percent duplicates. The estimated number of erroneous enumerations contributed from imputing unresolved status consists of 11.3 percent of the E-sample people in conflicting households. The 11.3 percent imputed erroneous enumerations can be classified into 4.6 percent potentially fictitious people, 5.9 percent people who lived elsewhere on Census Day and 0.8 percent other.

Table 3. Percent of E-sample Persons by Type of Erroneous Enumeration (standard error)

Final Housing Unit Match Status	Type of Erroneous Enumeration					Unresolved Imputed as Erroneous Enumeration
	Insufficient information	Duplicate	Fictitious	Geocoding error	Other residence	
Housing unit matched	1.7	0.4	0.1	0.0	0.8	0.4
	(0.03)	(0.01)	(0.01)	(0.00)	(0.02)	(0.02)
Housing unit not matched	3.1	4.3	0.6	2.9	2.1	1.6
	(0.19)	(0.25)	(0.09)	(0.50)	(0.13)	(0.10)
Conflicting household	3.4	6.6	9.3	0.0	7.6	11.3
	(0.30)	(0.49)	(0.90)	(0.00)	(0.51)	(0.66)
All	**1.8**	**0.8**	**0.3**	**0.2**	**1.0**	**0.6**
	(0.03)	**(0.03)**	**(0.02)**	**(0.04)**	**(0.02)**	**(0.02)**

Tables 4 shows the different types of A.C.E. nonresidents by final housing unit match status. The bases of the percents shown are all A.C.E. persons in the row category. The majority of the A.C.E. nonresidents in conflicting households are people who had other residences. The estimated number of nonresidents contributed from imputing the unresolved status consists of 9.1 percent of the A.C.E. people in conflicting households. These imputed nonresidents can be classified into 2.0 percent potentially fictitious people, 5.4 percent people who lived elsewhere on Census Day, and 1.7 percent others.

Table 4. Percent of A.C.E. Sample Persons by Type of Nonresident Status (standard error)

Housing Unit Match Status	Type of Nonresident					Unresolved Imputed as Nonresidents
	Did not live here	Other residence	Duplicate	Fictitious	Geocoding error	
HU matched	0.2	0.3	0.2	0.0	0.0	0.4
	(0.01)	(0.01)	(0.01)	(0.00)	(0.00)	(0.01)
HU not matched	0.1	0.5	1.0	0.0	0.0	0.8
	(0.05)	(0.11)	(0.14)	(0.00)	(0.00)	(0.10)
Conflicting household	0.6	3.2	1.1	0.2	0.0	9.1
	(0.14)	(0.34)	(0.22)	(0.07)	(0.00)	(0.50)
All	**0.4**	**0.2**	**0.2**	**0.0**	**0.1**	**0.5**
	(0.01)	**(0.01)**	**(0.01)**	**(0.00)**	**(0.02)**	**(0.01)**

4.1.2. How many addresses of conflicting households were coded whole household erroneous enumeration or whole household nonresidents after followup?

To analyze the conflicting households, A.C.E. sample conflicting households and the corresponding E-sample households are linked using the housing unit match link. Conflicting households are then tabulated according to A.C.E. sample household categories and E-sample household categories. These household categories are classified by final person matching results. **Table 5** shows the unweighted number of conflicting household addresses by the final A.C.E. residence status. As shown in Table 5,

- There are more E-sample whole household erroneous enumeration addresses (1,057) than A.C.E. sample whole household removed addresses (646);
- There are a comparable number of whole household unresolved in the E-sample (1,070) and in the A.C.E. sample (1,132);
- Among conflicting household addresses whose A.C.E. household has at least one non-match resident, 875 E-sample households have whole household erroneous enumeration residence status, and 563 E-sample households have whole household unresolved residence status;
- Among conflicting household addresses whose E-sample household has at least one correct enumeration, 437 A.C.E. households have whole household removed residence status, and 630 A.C.E. households have whole household unresolved residence status.

Table 5. Distribution of Conflicting Household Addresses by Final Residence Status (unweighted)

E-Sample Household Residence Status	A.C.E. Sample Household Residence Status				
	Has at least one non-match resident	Whole household removed	Whole household unresolved	Mixed type removed and unresolved	Total
Has at least one correct enumeration	1,031	437	630	48	2,146
Whole household erroneous enumeration	875	74	101	7	1,057
Whole household unresolved	563	124	371	12	1,070
Mixed type erroneous and unresolved	52	11	30	3	96
Total	2,521	646	1,132	70	4,369

Weighted results can be found in Table A-3 of the Appendix.

Table 6 shows the number and percent of conflicting household addresses with at least one non-match resident by E-sample household category. At these addresses, A.C.E. collected information on the right household. The 1,031 households having at least one correct enumeration are probably families in doubled-up living arrangements or the result of mail misdeliveries. The 875 whole household erroneous enumerations indicate census enumeration errors. These households are further classified into different types of erroneous enumerations. There are 362 whole household fictitious, 238 whole household other residence, and 219 whole household duplicates.

Table 6. Distribution of Conflicting Household Addresses with at least one A.C.E. Non-matched Resident by E-sample Household Category

E-sample Household Category	Number of Addresses	Percent
Has at least one correct enumeration	1,031	40.9
Whole household erroneous enumeration	875	34.7
Whole household duplicate	219	8.7
Whole household other residence	238	9.4
Whole household geocoding error	5	0.2
Whole household fictitious	362	14.4
Mixed type whole household erroneous enumeration	51	2.0
Whole household unresolved	563	22.3
Mixed type erroneous and unresolved	52	2.1
Total	2,521	100.0

Similarly, **Table 7** shows the conflicting households with at least one correctly enumerated person by A.C.E. sample household category.   In these addresses, the census collected information for the right households. Whole household removed indicates A.C.E. interview errors.

Table 7. Conflicting Household Addresses that have at least one Correctly Enumerated E-sample Person

A.C.E. Sample Household Category	Number of Addresses	Percent
Has at least one non-match resident	1,031	48.0
Whole household removed	437	20.4
Whole household unresolved	630	29.4
Mixed type nonresident and unresolved	48	2.2
Total	2,146	100.0

4.1.3. How are interview errors observed by the Census Day residence questions on the followup form?

It is interesting to use the answers to the Census Day residence questions on the followup forms combined with match codes to analyze interview errors in conflicting households.

The A.C.E.(or census) household lived at the address if there is a non-match resident (or correct enumeration) in the household and the answer to the Census Day residence question was "Yes";

The A.C.E. (or census) household did not live at the address if one of the following is true:

- it has a whole household of nonresidents (or erroneous enumerations), or
- the followup form indicated that the whole household contains either persons who did not live at the address on the Census Day or potentially fictitious people.

Note: There are some exceptions to the definitions provided above. There are situations in which the followup form indicated a person lived at the sample address on the Census Day, but this person was coded as a nonresident for reasons such as duplication. It is also possible that the followup form said the person did not live at the address on Census Day, but this person was coded as a resident because the Census Day address was inside the cluster, e.g., next door.

As shown in **Table 8**, there were 651 (14.9 percent) housing units where both the A.C.E. household and the census household lived at the address on Census Day. This is a result of families in doubled-up living arrangements. The proportion of conflicting addresses where only the A.C.E. household lived at the address on Census Day (29.8 percent) is almost double the proportion of when only the census household lived at the address on Census Day (15.7 percent).

For 34.3 percent of housing units with conflicting cases, we were not able to determine if either household lived there on Census Day.

Table 8. Summary of which Households Lived at the Conflicting Household Address on Census Day

Which Household Lived at the Address	Number of Addresses	Percent
Both the A.C.E. household and the census household	651	14.9
The A.C.E. household only	1,302	29.8
The census household only	688	15.7
Neither the A.C.E. household nor the census household	228	5.2
Undetermined	1,500	34.3
Total	**4,369**	**100.0**

4.2. What are the characteristics of conflicting household addresses?

Table 9 provides the distribution of conflicting household addresses by the type of enumeration area. The majority of the housing units with conflicting households were in mailout/mailback enumeration areas. Of the A.C.E. sample housing units in mailout/mailback enumeration areas, 1.8 percent were conflicting households. Of the E-sample housing units in mailout/mailback enumeration areas, 1.7 percent were conflicting households.

Table 9. Distribution of Conflicting Household Addresses by Type of Enumeration Area

Type of Enumeration Area	Number of Addresses	Percent of Addresses	Percent A.C.E. sample Addresses	Percent E-sample Addresses
Mail out/mail back (MO/MB)	3,708	84.9	1.8	1.7
Update/Leave (U/L)	546	12.5	1.3	1.3
List/Enumerate	18	0.4	0.9	0.9
Rural Update/Enumerate	86	2.0	1.4	1.4
Urban Update/Leave	6	0.1	1.1	1.0
Urban Update/Enumerate	1	0.0	0.3	0.3
MO/MB to U/L conversion	4	0.1	0.6	0.6
All	4,369	100.0	1.7	1.6

Table 10 provides the distribution of conflicting household addresses by the type of basic address. The A.C.E. and Census had different classifications for the basic address types. Besides single family house and multi-unit building, A.C.E. had mobile home in parks, mobile home not in parks, single family house in a special place, multi-unit in a special place, and other as a category. The single-unit category in the following table includes single family house and single family home in a special place; the multi-unit category includes multi-unit building and multi-unit in a special place.

As shown in Table 10, there is roughly the same number of conflicting households at single unit addresses as multi unit addresses. However, multi-unit addresses have higher rates of conflicting households (3.1 and 2.6 percent) than single unit addresses (1.2 percent for both samples).

Table 10. Distribution of Conflicting Household Addresses by Type of Basic Address

Type of Basic Address (TBA)	A.C.E. Sample Household			E-sample Household		
	Number of Addresses	Distribution (%)	Percent of A.C.E. sample HUs	Number of Addresses	Distribution (%)	Percent of E-sample HUs
Single-unit	2,071	47.4	1.2	2,258	51.7	1.2
Multi-unit	2,013	46.1	3.1	2,111	48.3	2.6
Mobile home and others	285	6.5	1.8	--	--	
All	4,369	100.0	1.7	4,369	100.0	1.6

Table 11 provides the distribution of conflicting household addresses for the A.C.E. sample and the E-sample by tenure. There were more conflicting household addresses that were renter occupied (66.1 percent and 65.2 percent) than owner occupied (33.9 percent and 34.8 percent). Renter occupied housing units have a higher percentage of conflicting households (3.1 and 2.8 percent) than owner occupied housing units (0.9 percent for both A.C.E. and E-samples).

Table 11. Distribution of Conflicting Household Addresses by Tenure

Tenure	A.C.E. sample Household			E-sample Household		
	Number of Addresses	Distribution (%)	Percent of A.C.E. sample HUs	Number of Addresses	Distribution (%)	Percent of E-sample HUs
Owner Occupied	1,482	33.9	0.9	1,522	34.8	0.9
Renter Occupied	2,887	66.1	3.1	2,847	65.2	2.8
All	4,369	100.0	1.7	4,369	100.0	1.6

Table 12 provides the tenure for the linked household by census type of structure. A linked household occurs when the person or persons in A.C.E. and census sample households are matched. Results indicate that tenure reported from A.C.E. and from census did not agree at about 31 percent of the single unit conflicting household addresses and about 12 percent of the multi-unit conflicting household addresses. This refers to the situation where the A.C.E. household is owner and the census household is renter or the census household is owner and the A.C.E. household is renter.

Table 12. Tenure for the Linked Conflicting Household Addresses by Census Type of Structure

Tenure	Single Unit		Multi Unit		All	
Both A.C.E. household and census household are owners	936	41.4%	91	4.3%	1027	23.5%
The A.C.E. household is owner, the census household is renter	349	15.5%	106	5.0%	455	10.4%
The census household is owner, the A.C.E. household is renter	348	15.4%	147	7.0%	495	11.3%
Both A.C.E. household and census household are renters	625	27.7%	1,767	83.7%	2392	54.8%
All	2,258	100.0%	2,111	100.0%	4,369	100.0%

Table 13 provides tabulations of the number of conflicting household addresses by household mover status. Addresses of whole household outmovers have a higher percentage of conflicting households (5.4 percent) than addresses with at least one nonmover (1.6 percent). Of the 490 whole household outmover addresses, 218 are whole household unresolved, and 65 are whole household nonresident.

Table 13. Conflicting Household Addresses by Household Mover Status

Mover Status	Number of Addresses	Distribution (%)	Percent of Mover Status Categories that are Conflicting HH's
Whole household outmovers	490	11.2	5.4
At least one nonmover in the household	3,879	88.8	1.6
All	**4,369**	**100.0**	**1.7**

4.3. What are the characteristics of persons in conflicting households?

According to **Table 14**, by race domain, more than 40 percent of the people in conflicting households are Hispanics or non-Hispanic Blacks. Hispanics and Blacks have the highest percent being in conflicting households. A.C.E. sample conflicting households had a slightly higher percentage of non-Hispanic Blacks and lower percentage of non-Hispanic Whites than E-sample conflicting households. The columns of percent in conflicting households show the percent of A.C.E. sample or E-sample people in the race domain category who are in a conflicting household.

Table 14. People in Conflicting Households by Race Domain (weighted)

Race Domain	A.C.E. Sample Household			E-sample Household		
	Number of Persons	**Distribution (%)**	**Percent of Race Domain in Conflicting HH's**	**Number of Persons**	**Distribution (%)**	**Percent of Race Domain in Conflicting HH's**
American Indian on reserves	4,437	0.14	1.1	5,125	0.14	1.2
American Indian off reserves	30,010	0.97	2.4	16,280	0.60	1.2
Hispanic	719,028	23.31	2.2	823,957	23.22	2.5
Non-Hispanic Black	653,010	21.17	2.2	731,938	20.63	2.3
Pacific Islander	5,878	0.19	1.1	8,784	0.25	1.8
Non-Hispanic Asian	145,272	4.71	1.6	176,016	4.96	1.8
Non-Hispanic White and Others	1,527,529	49.51	0.8	1,785,651	50.33	0.9
All	3,085,165	100.0	1.2	3,547,750	100.0%	1.3

13

Table 15 provides information about people in conflicting households by age/sex group. Males between the ages 18-29 have the highest percentage of people in conflicting households in both the A.C.E. and E-samples (2.1 and 2.2 percent). Females 50 or older have the lowest percentage(0.7 percent and 0.9 percent) of people in conflicting households for both A.C.E. and E-samples.

Table 15. People in Conflicting Households by Age/Sex Group (weighted)

Age/Sex Group	A.C.E. Sample Household			E-sample Household		
	Number of Conflicting People in Age/Sex Group	**Distribution (%)**	**Percent of Age/Sex Group that are from Conflicting HH's**	**Number of Conflicting People in Age/Sex Group**	**Distribution (%)**	**Percent of Age/Sex Group that are from Conflicting HH's**
1-17	725,027	23.50	1.1	826,495	23.30	1.2
18-29, male	430,578	13.96	2.1	457,327	12.89	2.2
18-29, female	374,548	12.14	1.8	394,755	11.13	1.9
30-49, male	570,212	18.48	1.4	602,617	16.99	1.5
30-49, female	465,942	15.10	1.1	543,074	15.31	1.3
50+, male	245,749	7.97	0.8	349,697	9.86	1.0
50+, female	273,110	8.85	0.7	373,787	10.54	0.9
All	3,085,165	100.00	1.2	3,547,750	100.00	1.3

4.4. What causes conflicting households?

Initial conflicting households were sent to person followup interview. The following reasons are observed from the notes on followup forms.

- One of the households moved out and the other moved in before or after the Census Day.

  The A.C.E. captured the current residents while those enumerated by the Census had moved out. Interview errors occurred in this situation.

- Housing unit mix ups.

  For multi-unit addresses, the two linked households lived in different units in the same multi-unit apartment complex or in the same small multi-unit building without unit designation. For single family houses, one of the households lived at the sample address, the other household lived at another address inside or outside the block cluster.

- Families in doubled-up living arrangements.

  Two or more families lived at the same address. As shown in Table 8, 651 of the final conflicting households fall in this category. The three following situations were observed:
  - ✓ The two households shared the same housing unit.
  - ✓ There are both an owner and a renter household living at the same address (See Table 12).
  - ✓ The two households lived at the same address with separate entrances or in different levels.

- One household (usually the census) was the owner who did not live at the address, the other household was the renter.

- Misspelled names, or inconsistent use of nicknames, maiden names.

  There were 324 addresses of initial conflicting household that later had person matches between the linked A.C.E. household and census household. In many of these cases, matches were found after names were resolved in the followup interviewing.

- A.C.E. listing errors, error with the DMAF, and matching errors in the preliminary housing unit matching.

  A small portion (75 addresses, or 1.7%) of the initial housing unit match link of the addresses of initial conflicting households were found to be false in the final housing unit operation. Table A-2 in the Appendix shows the final housing unit matching results of the initial conflicting households.

- Other reasons observed involved language barriers.

  Interviewers may not have been able to communicate and conduct an interview in the language of the household respondent.

5. CONCLUSIONS

There are 4,369 addresses of final conflicting households in the A.C.E. sample. The estimated number (weighted) of people in these conflicting households are 3,085,165 A.C.E. persons and 3,547,750 census persons, or 1.2 percent of the A.C.E. sample and 1.3 percent of the E sample.

There is a higher degree of census enumeration errors than A.C.E. interview errors observed in conflicting households. In conflicting households,

- The percent of E-sample people coded as confirmed erroneous enumerations is higher than the percent of A.C.E. people coded as confirmed nonresidents (26.9 percent vs. 5.1 percent);
- The percent of A.C.E. sample people having unresolved status is higher than that of E-sample people having unresolved status (30.4 percent vs. 26.3 percent);
- Taking into account the imputation for residency and enumeration status, the estimated number of E-sample erroneous enumerations is bigger than the number of nonresidents among the A.C.E. persons (1,355,026 vs. 436,900);
- High erroneous enumeration rates are found in conflicting households. Among E-sample persons in the conflicting households, 9.3 percent are fictitious, 7.6 percent are other residence, 6.6 percent are duplicates, 3.4 percent are insufficient information, 4.6 percent are erroneous enumerations imputed from potentially fictitious people, and 5.9 percent are erroneous enumerations imputed from people who lived elsewhere on Census Day.
- Among A.C.E. sample persons in the conflicting households, 3.2 percent are other residence, 2.0 percent are nonresidents imputed from potentially fictitious people, and 5.4 percent are nonresidents imputed from people who lived elsewhere on Census Day.

Among the housing units with conflicting households,

- There are more E-sample whole household erroneous enumerations (1,057) than A.C.E. sample whole household nonresidents (646);
- There are similar numbers of A.C.E. addresses of whole household unresolved (1,132) and census addresses of whole household unresolved (1,070).
- The followup interviews indicate that for 1,302 addresses it was the A.C.E. household rather than the census household that lived at the particular address on Census Day. For 688 addresses, it was the census household rather than the A.C.E. household that lived at the particular address on Census Day.

Among persons in conflicting households,

- Hispanics, Blacks, people of age 18-29, and males of age 30-49 have the highest percentage of being in conflicting households.
- Most of the conflicting households live in multi-unit structures and about two thirds are renter occupied.
- About forty-four percent of the people in conflicting households are Black or Hispanic.

16

- We also found that about 30 percent of the single-unit addresses of conflicting households were doubled-up families where one household is the owner, and the other is the renter.
- People from conflicting households have a higher unresolved rate (30.4 percent for Accuracy and Coverage Evaluation sample and 26.3 percent for census sample) than people in matched (1.8 and 1.5 percent respectively) and not matched (3.7 and 10.8 percent) housing units.

There were several reasons that could create conflicting households at an address:

- More than one household could live at the same address and the A.C.E. and the Census may have each enumerated information on a different household;
- For some multi-unit apartments, census forms were delivered to a common area and were picked up by respondents randomly. Accidentally, a respondent could fill out a form that was addressed to another apartment and consequently, the A.C.E. person interviews enumerated a different household in that apartment;
- A.C.E. interviews or census enumerations could be conducted at the wrong address;
- People who moved between the census enumeration and A.C.E. person interviews may also cause conflicting households.

6. REFERENCES

Childers, Danny (2000) "Accuracy and Coverage Evaluation: The Design Document", DSSD Census 2000 Procedures and Operations Memorandum Series, S-DT-1

Hogan, Howard (1993) "The 1990 Post-Enumeration Survey: Operations and Results", Journal of the American Statistical Association, Vol 88, No 423.

7. APPENDIX - A

Table A-1. Final Conflicting Household Addresses by Initial Housing Unit Match Status

Initial Housing Unit Match Status	A.C.E. sample	E-sample
Housing unit was matched but was not conflicting household	330	246
Housing unit was not matched	100	81
Census adds		105
Initial conflicting household addresses	3,939	3,937
Total	**4,369**	**4,369**

Table A-2. Initial Conflicting Household Addresses by Final Housing Unit Match Status

Final Housing Unit Match Status	A.C.E. sample	E-sample
Final conflicting household addresses	3,939	3,937
Matched to the same address	*3,927*	*3,927*
Matched to a different address	*12*	*10*
Address matched (not conflicting household)	452	449
Matched to the same address	*434*	*434*
Matched to a different address	*18*	*15*
Address not matched	16	50
[1]Not in final housing unit matching	29	0
Total	**4,436**	**4,436**

[1] Whole household geocoding errors

Table A-3. Distribution of Conflicting Household Addresses by Final Residence Status (weighted)

E-sample Household Residence Status	A.C.E. Sample Household Residence Status				
	Has at least one non-match resident	Whole household removed	Whole household unresolved	Mixed type removed and unresolved	Total
Has at least one correct enumeration	366,653	20,747	228,514	14,711	630,626
Whole household erroneous enumeration	324,470	8,385	41,392	1,604	375,851
Whole household unresolved	214,437	11,067	142,799	3,968	372,271
Mixed type erroneous and unresolved	17,626	606	12,406	668	31,307
Total	923,187	40,805	425,111	20,951	1,410,054

Table A-4. Comparison of A.C.E. Sample Non-match Residents and E-sample Erroneous Enumerations (the number on top is the weighted number of nonmatch residents and the number on the bottom is the weighted number of erroneous enumerations)

E-sample Household	A.C.E. Sample Household				
	Has at least one non-match resident	Whole household removed	Whole household unresolved	Mixed type removed and unresolved	Total
Has at least one correct enumeration	764,993 70,323	0 18,182	286,230 17,722	10,989 86	1,062,152 106,313
Whole household erroneous enumeration	757,529 679,341	0 56,455	43,781 69,437	968 5,664	802,278 810,898
Whole household unresolved	473,391 244,299	0 37,303	174,329 87,856	2,319 3,495	650,038 372,953
Mixed type erroneous and unresolved	42,475 38,567	0 4,801	18,016 18,713	755 2,782	61,246 64,863
Total	2,038,328 1,032,530	0 116,742	522,356 193,728	15,030 12,027	2,575,714 1,355,026