

Chapter VI: STAGE II ENUMERATION IN TWO-STAGE AREAS

Approximately one-third of the Stage I enumerators in two-stage enumeration areas were retained for the second stage of the enumeration. These enumerators were given the Household Questionnaires that had been received in the District Offices from the sample households and the Stage II enumeration books that the Stage I enumerators had initiated by transcribing the Stage I information for sample households and housing units. The Stage II enumerators transcribed the sample information from the Household Questionnaires to the Stage II enumeration books. If the information was incomplete or a Household Questionnaire had not been received for a household, the enumerators were to obtain the required information by telephone or personal visit. On the average, three Stage I enumeration areas were given to each Stage II enumerator.

The work of the Stage II enumerator was reviewed by crew leaders and field reviewers in a manner generally similar to the field reviews for the Stage I operation. However, Stage II field review was different from that of Stage I in three respects: (1) On the first EA an enumerator could have a maximum of three field reviews; but the remaining EA's were given only final reviews. (2) Because of the greater variety of information required for the sample households and housing units, there were more complicated consistency checks. (3) The accuracy of the transcription from the Household Questionnaires had to be reviewed. (In Stage I, the Fosdic schedule was the basic enumeration document; and even though the information was sometimes transcribed from an Advance Census Report which the householder had filled out, the transcription was done in the presence of the householder and the enumerator could ask questions and correct the information when necessary.)

When the completed Stage II enumeration books were returned to the District Office they were subjected to an office review. Any enumeration books that failed the office review were sent back to the field for correction.

Field Review

The field reviews, verification of the transcription from the Household Questionnaires, and the closeout review for Stage II in two-stage areas were to be recorded on form F-244, Record of Field Review, PH-3 and PH-4. A sample of such forms received in Jeffersonville represents only 68 percent of the two-stage EA's. This is a considerably lower proportion than the estimated representation of Stage I EA's by field review forms. It is impossible to determine how

many forms were not sent to Jeffersonville or how many reviews were just not made.

If the tallies recorded on the forms F-244 are correct, the reviewers were more likely to take the correct action after Stage II field review than they were after Stage I field review: Table 36 shows that 95 percent of the EA's were handled correctly in Stage II (compared with about 80 percent in Stage I). The few reports received from the Technical Officers on their evaluations of Stage II field review also reflect a better performance by the crew leaders in Stage II: 90 percent correct actions (lines 8 and 9 of form F-244, table 4) compared with 84 percent in Stage I.

Table 32.--Errors in Each Field Review Section on First Review: Stage II of Two-Stage Areas
(Proportion of enumerators)

Number of errors	Field review section				
	I	II	III	IV	V
Total..	1.00	1.00	1.00	1.00	1.00
0.....	.82	.52	.37	.46	1.99
1.....	.10	.15	.17	.15	.01
2.....	1.06	.14	.07	.13	(2)
3.....	(2)	.05	1.03	.10	-
4.....	(2)	.03	(2)	.06	-
5.....	-	1.02	(2)	.02	-
6.....	(2)	(2)	-	.03	-
7.....	-	.01	-	.02	-
8.....	(2)	(2)	-	.01	-
9.....	-	(2)	-	.01	-
10.....	-	(2)	-	1.01	-
11.....	-	-	-	(2)	-
12.....	-	(2)	-	(2)	-
13.....	-	-	-	-	-
14.....	-	-	-	-	-
15.....	-	-	-	-	-
16.....	-	-	-	-	-
17.....	-	-	-	-	-
18.....	-	-	-	-	-
19.....	-	-	-	-	-
20 or more	(2)	-	-	(2)	-

² Less than .005.

¹Maximum allowable errors.

Source: Forms F-244, Record of Field Review, PH-3 and PH-4.

Table 33.--Errors in Each Field Review Section on Final Review: Stage II of Two-Stage Areas
(Proportion of enumerators)

Number of errors	Field review section				
	I	II	III	IV	V
Total.	1.00	1.00	1.00	1.00	1.00
0.....	.92	.69	.83	.58	¹ .98
1.....	.05	.14	.11	.16	.01
2.....	¹ .02	.09	.04	.10	(Z)
3.....	(Z)	.03	¹ .02	.06	(Z)
4.....	(Z)	.02	(Z)	.04	(Z)
5.....	(Z)	¹ .01	(Z)	.02	(Z)
6.....	-	(Z)	(Z)	.01	-
7.....	-	(Z)	(Z)	.01	(Z)
8.....	(Z)	(Z)	-	.01	-
9.....	(Z)	-	-	(Z)	-
10.....	-	-	-	¹ .01	-
11.....	-	-	-	(Z)	-
12.....	-	-	-	-	-
13.....	-	-	-	-	-
14.....	-	-	-	-	-
15.....	-	-	-	-	-
16.....	-	-	-	-	-
17.....	-	-	-	-	-
18.....	-	-	-	-	-
19.....	-	-	-	-	(Z)
20 or more	-	-	-	(Z)	-

Z Less than .005.

¹Maximum allowable errors.

Source: Forms F-244, Record of Field Review, PH-3 and PH-4.

Table 34.--Field Review Sections Failed: Stage II of Two-Stage Areas

(Proportion of EA's)

Number of review sections failed	First review	Final review
Total.....	1.00	1.00
None.....	.96	.99
1.....	.03	(Z)
2.....	.01	-
3.....	(Z)	(Z)
4.....	-	-
5.....	-	-

Z Less than .005.

Source: Forms F-244, Record of Field Review, PH-3 and PH-4.

Table 35.-- Specified Enumeration Book Errors: Stage II of Two-Stage Areas

(Proportion of enumerators)

Type of error	First review	Final review
Pages with creases, tears, or marks in margins.....	.01	.01
Blank sections with marks that might be picked up by FOSDIC.....	(Z)	.01
Missing questionnaire entries not noted on outer margin of page.....	.08	.05
Rules on the green sheet in front of the enumeration book not followed by enumerator when he found changes in sample housing units.....	.01	(Z)
Household questionnaire not brought to field review for units which had been transcribed.....	.02	.01

Z Less than .005.

Source: Forms F-244, Record of Field Review, PH-3 and PH-4.

Table 36.--Action Taken in Field Review Compared to Correct Action: Stage II of Two-Stage Areas

Action taken	Proportion of EA's
Total.....	1.000
Correct action performed.....	.951
Enumerator released.....	(Z)
Intermediate review made.....	.007
Only first and final review made.	.313
Final review only ¹631
Incorrect action performed.....	.029
Enumerator not released.....	.002
More reviews than necessary performed.....	.004
Not enough reviews made.....	.023
Correct action uncertain.....	.020
Only first review performed.....	.002
Only first and final reviews performed.....	.001
Not ascertainable.....	.017

Z Less than .0005.

¹It is assumed here that these were additional assignments undertaken by enumerators who had successfully completed their first assignments.

Source: Forms F-244, Record of Field Review, PH-3 and PH-4.

Stage II field review concentrated mainly upon the completeness of the sample housing and population information although checks were made for the accuracy and use of the Listing Book. For many items there was a reduction of only about 25 percent in the errors found between first and final reviews. Practically no EA's failed first review, according to reviewers. About one percent of the EA's failed final review.

Table 2 shows the error rates for each population and housing item checked during field review.

In all the discussion above it has been assumed that some enumerators did better work than others and that the problem was to release or retrain or correct the work of the worst enumerators. The proof that this actually was the case lies in table 45. If all the enumerators had performed at the same level, samples of their work of the size used in field review would have shown the "worst" 5 percent of them to be making no more than 10 percent of all the errors. (These enumerators would only appear to be the worst because of sampling variability.) However, the worst 5 percent of the Stage II enumeration books in the national sample contained 41 percent of the nonresponses for sample population items. The worst 10 percent contained 58 percent of the nonresponses, and the worst 20 percent, 76 percent of the nonresponses.

The most useful and concise summary of the effectiveness of Stage II quality control is found in table 29 (which covers Stage I and single-stage quality control as well). The table compares the estimated actual error rates and the proportions of ED's (enumeration book or books) which should have been rejected, as measured by the national sample of enumeration books, with the corresponding data reported at first review, final review, and office review.

The reported nonresponse rate went from .012 at first review to .007 at final review and .007 at office review. The actual nonresponse rate, however, as measured by the national sample, was .032. Thus, crew leaders and office reviewers were finding and reporting only about 22 percent of the actual omissions. Although .228 of the EA's should have been rejected at final review, only .005 were—a ratio of 46 to 1. Although .071 of the ED's should have been rejected in office review, only .008 were—a ratio of 9 to 1.

An investigation of the actual nonresponse rate of .032 showed that about one-third of the omissions were for people for whom no sample information at all was obtained. These people were in housing units which were not marked as closeout in the Listing Book. If these cases had been identified and eliminated from final review, the rate of .032 would have dropped to .022. This group, along with closeout housing units, will represent a special problem in the next census.

Certain concessions made to simplify the field review operation detracted somewhat from the rigor of the process. For population items in Stage II there was one acceptance number regardless of the number of

people that turned out to live in the four housing units sampled. The standard applied to EA's where there were exactly 12 people in the four housing units. Any time there were substantially more than 12 people there was a greater risk of accepting bad work. With fewer than 12 people, there was a greater risk of rejecting good work. The alternative would have been to set rejection numbers which varied by number of persons. This was done in the office inspection.

Simplified sample selection for final review in Stage II of two-stage areas probably led to an unrepresentative sample of the enumerator's work. Each field review form was printed with the numbers 1 through 24 in the same random sequence. The reviewers were to circle each number that represented a page used in the Listing Book until they had circled 6 numbers. Part of the final review covered the pages in the Listing Book represented by the first four numbers circled; the completeness check for the sample data was for the first sample unit on each of the last four page numbers circled. For the average Listing Book of 13.5 pages the result would be:

20	17	23	②
⑩	④	③	⑪
18	⑥	22	15
12	1	14	8
16	19	24	7
21	5	13	9

This type of inspection for final review hardly covered a random sample of all the enumerator's work. The first sample unit on page 3 was certain to be among the four pages chosen for completeness check unless the Listing Book contained more than 22 pages; that on page 4 was also certain to be chosen unless the Listing Book contained from 5 to 10 pages. In all, 71 percent of the units inspected in the sample of Stage II assignments covered units on the first six pages of the Listing Book, which could quite possibly have not represented the entire range of an enumerator's work. One alternative would have been to provide crew leaders with random samples which varied with the number of pages used in the Listing Book.

Closeout Review

In the Stage II closeout review the field reviewer was not to review each closeout case for missing items of information. Instead, he was to tally each closeout case according to whether or not a Household Questionnaire had been received. If an assignment contained four or more closeout cases for which no Household Questionnaire was received or if it contained 10 or more closeout cases for which an incomplete Household Questionnaire was received, the books for the assignment were given to a "closeout enumerator" for revisits to all closeout cases.

After June 10, 1960, this procedure was changed: Any EA that failed the closeout check was not given to

Table 37.--Results of Closeout Review: Stage II of Two-Stage Areas

Result according to tallies on forms F-244	Proportion of EA's
Total.....	1.00
No evidence of closeout review.....	.13
Some evidence of closeout review.....	.87
Tallies incomplete.....	.21
Tallies complete.....	.66
Failed.....	1.12
Passed.....	.54

¹Only .05 were actually rejected, according to the action shown by the crew leader on Line 68.

Source: Forms F-244, Record of Field Review, PH-3 and PH-4.

Table 38.--EA's Marked for Rejection in Closeout Review: Stage II of Two-Stage Areas

Rejected on form F-244, on--	Total	Urban		Rural
		Block	Nonblock	
Line 66 (Four or more closeout cases with no Household Questionnaire received).....	.116	.172	.073	.071
Line 67 (Ten or more closeout cases for which Household Questionnaire was received).....	.005	.010	.002	.002

Source: Forms F-244, Record of Field Review, PH-3 and PH-4.

Table 39.--Error Rates for Sample Population and Housing Items by Closeout Status: All Areas

Item	Error rate ¹		
	All areas	Two-stage areas	Single-stage areas
Sample population items:			
Excluding closeouts...	.032	.032	.032
Including closeouts...	.047	.052	.036
Sample housing items:			
Excluding closeouts....	.025	.023	.031
Including closeouts...	.030	.029	.031

¹Ratio of nonresponses and inconsistent responses to total expected responses.

Source: National sample of completed Stage II enumeration books.

a cleanup enumerator but was sent to the District Office. There a dummy sample questionnaire was made up for each occupied closeout unit, with incomplete items marked. This questionnaire was mailed to the households with a return envelope addressed to the Regional Office.

There is evidence that the crew leaders and field reviewers conducted some kind of closeout review for 87 percent of the sample EA's. According to the tallies on forms F-244, 12 percent of all EA's should have been rejected for closeout deficiencies.

The closeout entries were complete on only two-thirds of the forms F-244. As noted above, the tallies showed that 12 percent of all the EA's should have been

Table 40.--Housing Units Enumerated by Closeout Procedure: Stage II of Two-Stage Areas

(Proportion of EA's)

Number of closeout housing units	Total	Urban block	Urban nonblock	Rural
All questionnaires.....	1.00	1.00	1.00	1.00
0.....	.38	.27	.40	.52
1.....	.18	.17	.20	.17
2.....	.14	.14	.15	.12
3.....	.09	.11	.08	.07
4.....	.05	.06	.06	.04
5.....	.03	.04	.03	.02
6.....	.02	.03	.02	.01
7.....	.02	.03	.01	.01
8.....	.01	.02	.01	.01
9 or more.....	.08	.12	.03	.04
Questionnaires not returned by mail.....	1.00	1.00	1.00	1.00
0.....	.41	.32	.43	.55
1.....	.20	.18	.24	.19
2.....	.13	.15	.14	.10
3.....	.10	.12	.10	.06
4 ¹04	.05	.03	.04
5.....	.02	.03	.01	.01
6.....	.01	.02	.01	.01
7 or more.....	.08	.12	.05	.04
Questionnaires returned by mail.....	1.00	1.00	1.00	1.00
0.....	.72	.63	.75	.84
1.....	.12	.16	.10	.08
2.....	.06	.08	.07	.04
3.....	.03	.04	.03	.02
4.....	.02	.03	.02	.01
5.....	.02	.02	.02	-
6.....	.01	.01	-	-
7.....	-	.01	-	-
8.....	-	-	-	-
9.....	-	-	-	-
10 or more ²01	.02	-	-

¹Rejection number.

²The rejection number was 10.

Source: Forms F-244, Record of Field Review, PH-3 and PH-4.

rejected for failing the closeout check, but the "Yes" box in item 68 indicating closeout failure was marked for only 5 percent. The Regional Office telegraphic reports show only 2 percent.

The results of the Stage II closeout inspection in the field show that the problem of closeout cases was more serious in Stage II than in Stage I: About 12 percent of the Stage II EA's failed closeout review, compared with only 2 percent of the Stage I.

They also show (table 38) that over twice as high a proportion of EA's in urban block areas should have failed closeout review as in other areas. In certain cities the closeout problem was so severe that enumerators were sent out to revisit households for which the followup questionnaires were not returned. This work took place in Chicago, Detroit, San Francisco, St. Louis, Philadelphia, and Washington, D.C.

District Office Quality Control

The people who worked on Stage I quality control work in the District Offices were also used, if they had proved satisfactory, in the Stage II office operations. The plan consisted only of a completeness check on population and housing data. There was to be no re-verification of the transcription from the Household Questionnaires and no review of the closeouts in each EA.

Results of the office check were recorded on a form F-280, Office QC Record for PH-3 or PH-4, for each crew leader and field reviewer. Responses for every twelfth household were inspected. Enumeration books for any given ED were to be rejected and returned to the field for clean-up if the nonresponse rate exceeded

Table 41.--Technical Officers' Evaluation of Field Review: Stage II of Two-Stage Areas

Description of check	Total	Field review made according to instructions	Field review made but not completely or correctly	Field review not made
Form F-244:				
I. Listing Book review.....	1.00	.94	.02	.04
II. Household Questionnaire transcription.....	1.00	.91	.03	.06
Lines 8 and 9,.....	1.00	.90	.01	.09
III. Housing item review.....	1.00	.93	.03	.04
IV. Population item review.....	1.00	.93	.04	.04
V. Listing Book enumeration book agreement.....	1.00	.91	.02	.07
Lines 61-64.....	1.00	.86	.01	.13
VII. Closeout review.....	1.00	.37	.01	.62
Average.....	1.00	.84	.02	.14
Other:				
1. Correct pages and units reviewed	1.00	.93	.03	.04
2. Correct pages reviewed in Listing Book and enumeration book.....	1.00	.94	.02	.04
3. All errors recorded on F-244.....	1.00	.91	.05	.04
4. Enumerator required to fill form F-214	1.00	.79	.12	.09
5. F-214 from earlier review checked	1.00	.48	.16	.36
6. Action taken correctly in section VI of F-244	1.00	.90	.01	.09
7. Enumerator given F-242 when necessary	1.00	.34	.04	.62
Average.....	1.00	.76	.06	.18

Source: Forms F-289A, Evaluation of Field Review for PH-3 or PH-4.

4.8 percent, assuming a standard mix of population and housing lines.

A sample of forms F-280 was examined to determine error rates in the office operation for the groups of items that appeared on the review form. The results are given in table 2. As was observed in Stage I, the error rates for housing items greatly exceed those for population items.

Table 2 also compares the error rates reported in the Stage II office quality control operation with those reported in field review and with the estimated actual rates, as obtained from an analysis of the national sample of completed enumeration books. The overall error rate in the office compares favorably with that reported by crew leaders, but it represents only about one-third of the errors that were estimated to be actually present.

Although the Regional Office telegrams reported that 1.6 percent of the ED's had been rejected in Stage II office review in two-stage areas, the sample of two-stage forms F-280 shows only 0.8 percent. The proportion which should have been rejected, according to the national sample, was 7 percent.

Table 42.--Errors Found in Sample Population Items: Two-Stage Areas

Number of errors ¹	Proportion of EA's: Final field review	Proportion of ED's: National sample of completed enumeration books
Total.....	1.00	1.00
0.....	.58	.30
1.....	.16	.16
2.....	.10	.12
3.....	.06	.09
4.....	.04	.04
5.....	.02	.05
6.....	.01	.02
7.....	.01	.03
8.....	.01	.02
9.....	(Z)	.01
10.....	.01	.01
11 ²	(Z)	.02
12.....	-	.02
13.....	-	.01
14.....	-	.01
15.....	-	.01
16.....	-	-
17.....	-	(Z)
18.....	-	(Z)
19 or more.....	(Z)	.07

(Z) Less than .005.

¹Closeout housing units excluded from both checks.

²The rejection number on final field review.

Source: Forms F-244, Record of Field Review, PH-3 and PH-4, and national sample of completed enumeration books.

Part of the difficulty in the Stage II office review can perhaps be attributed to a lack of purity in the office quality control operations. The following describes the way in which time-study observers found office quality control to be running:

The quality-control operations were so named because they were intended to be a sample inspection of the quality of census results. However, they became subverted to other purposes. A large part of the time spent in these operations was devoted to checking on payrolling, an administrative aspect of the census. Much more time appears to have been used on this activity than the instructions called for.

An inordinate amount of time was apparently spent correcting counts on the summary page of the listing book. One observer estimated that at least half the time in the Stage II quality-control operation was spent referring to Stage I listing books to reconcile Stage I and Stage II counts. In some offices, quality-control clerks were not only making the required checks and changes on payroll forms but were also engaged in payroll

Table 43.--Errors Found in Sample Housing Items: Two-Stage Areas

Number of errors ¹	Proportion of EA's: Final field review	Proportion of ED's: National sample of completed Fosdic books
Total.....	1.00	1.00
0.....	.83	.54
1.....	.11	.20
2.....	.04	.10
3.....	.02	.03
4 ²	(Z)	.03
5.....	(Z)	.02
6.....	(Z)	.02
7.....	(Z)	.01
8.....	-	.01
9.....	-	(Z)
10.....	-	(Z)
11.....	-	.01
12.....	-	.01
13.....	-	(Z)
14.....	-	-
15.....	-	-
16.....	-	-
17.....	-	(Z)
18.....	-	.01
19 or more.....	-	.01

(Z) Less than .005.

¹Closeout housing units excluded from both checks.

²The rejection number on final review.

Source: Forms F-244, Record of Field Review, PH-3 and PH-4, and national sample of completed enumeration books.

computation and verification, a job which was intended for the Regional Offices.

Other operations performed by people hired for quality-control work included transcribing data from missed-persons forms to enumeration books, correcting Stage I enumeration books when missed persons were found in Stage II, and posting data from late-arriving household questionnaires to Stage II books.¹

¹ U.S. Bureau of the Census, *United States Censuses of Population and Housing, 1920: Enumeration Time and Cost Study*, pp. 20-21.

Table 44.-- Error Rates Found in Population and Housing Items in National Sample: Two-Stage Areas

(Excludes households and housing units enumerated by closeout procedure)

Nonresponse rate ¹	Sample population items		Sample housing items	
	Proportion of ED's	Cumulative proportion of ED's	Proportion of ED's	Cumulative proportion of ED's
Total.	1.000	1.000	1.000	1.000
.000.....	.317	.317	.542	.542
.001 to .009	.162	.479	.000	.542
.010 to .019	.154	.633	.094	.636
.020 to .029	.106	.739	.046	.682
.030 to .039	.022	.767	.089	.771
.040 to .049	.058	.825	.015	.786
.050 to .059	.061	.886	.043	.829
.060 to .069	.028	.914	.005	.834
.070 to .079	.000	.914	.000	.834
.075 to .079	.005	.919	.056	.890
.080 to .089	.008	.927	.000	.890
.090 to .099	.007	.934	.023	.913
.100 to .199	.022	.962	.048	.961
.200 to .299	.011	.975	.014	.975
.300 to .399	.015	.990	.012	.987
.400 to .499	.005	.995	.010	.997
.500 & over.	.005	1.000	.005	1.000
Mean....	(X)	.032	(X)	.025
Median..	(X)	.013	(X)	.000

(X) Not applicable.
¹This is the so-called "true" error rate used throughout this report. It is only "truer" than any others in the sense that it is based on a careful inspection after processing and a count of the number of people inspected.

Source: National Sample of completed enumeration books for Stage II.

Table 45.-- Proportion of Total Errors Made by Worst Enumerators: Stage II of Two-Stage Areas

Cumulative proportion of enumerators from worst to best	Proportion of total errors	
	Actual ¹	Theoretical ²
.05.....	.41	.10
.10.....	.58	.19
.15.....	.69	.26
.20.....	.76	.33
.50.....	.95	.66
.80.....	1.00	.92
1.00.....	1.00	1.00

¹From the analysis of a National Sample of completed enumeration books. The assumption is that each ED was worked on by a different enumerator, which may not always have been the case. The error rate was .032 and the number of items inspected in each ED was about 220.

²From a binomial distribution, assuming that all enumerators have an error rate of .030 and that 200 items are inspected. Contributed by Dr. Benjamin J. Tepping.

Note: In single-stage areas the errors were slightly less concentrated: the worst 7 percent of the enumerators made 40 percent of the errors.

Source: National Sample of completed enumeration books.

Table 46.--Errors Per Population or Housing Section as Found in Office Quality Control: Stage II of Two-Stage Areas

Errors per section inspected ¹	ED's	Crew leaders ²
Total.....	1.00	1.00
1.00.....	.45	.03
.01 to .10.....	.26	.51
.11 to .20.....	.14	.32
.21 to .30.....	.06	.09
.31 to .40.....	.03	.03
.41 to .50.....	.03	.01
.51 to .60.....	.01	.01
.61 to .70 ³	(Z)	(Z)
.71 to .80.....	(Z)	(Z)
.81 to .90.....	(Z)	-
.91 to 1.00.....	(Z)	-
1.01 or more.....	(Z)	-
Mean errors per section..	.09	.10

(Z) Less than .005.

¹A section is defined as either a housing section or a population section (each with an expected 11 items). Errors include omissions.

²Review of enumeration book or books for approximately 40 ED's per crew leader.

³ED enumeration book or books rejected when errors per line greater than .67, which is equivalent to a 6 percent error rate on an item basis.

Source: Forms F-280, Office QC Record for PH-3 and PH-4.