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FINAL REPORT HUDQC STUDY FY 2012

QUALITY CONTROL FOR RENTAL ASSISTANCE SUBSIDY DETERMINATION

September 27, 2013

Quality Control for Rental Assistance Subsidy Determinations

Final Report for FY 2012

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EXECUTIVE SUMMARY

The Department of Housing and Urban Development (HUD) contracted with ICF Macro, Inc., an ICF International Company (hereafter referred to as ICF) to conduct the Quality Control for Rental Assistance Subsidy Determinations (HUDQC) Study. The HUDQC Study provides national estimates of the extent, severity, costs, and sources of rent errors in tenant subsidies for the largest housing programs administered by the Office of Public and Indian Housing (PIH) and the Office of Housing. These programs account for nearly all of HUD's current housing assistance outlays administered by PIH and the Office of Housing, as well as the large majority of units assisted by HUD. This study was designed to measure the extent of administrator income and rent determination error by housing providers. It does not involve an audit of individual Public Housing Authorities (PHAs) or projects, nor does it monitor the implementation of housing programs. Its singular focus is to identify households for which an error was made in the calculation of the amount of the household's rent and to provide nationally representative findings related to those errors.

The errors ICF evaluated in this study affect the rent contributions tenants should have been charged. The findings presented in this report are a result of data collected from November 2012 through April 2012 for actions taken by PHA and project staff during Federal fiscal year (FY) 2012 (October 2011 through September 2012). These findings show that 72 percent of households nationally paid the correct amount of rent in FY 2012. In 12 percent of the cases, households paid too much rent, and, in an additional 16 percent of the cases, the households paid too little.

HUD administers its rental housing assistance programs through third-party program administrators, including PHAs, public and private project owners, and contracted management agents. In the programs examined, eligible tenants are generally required to pay 30 percent of their adjusted income toward shelter costs (i.e., contract rent plus utilities), with HUD providing the balance of the rental payment. New program applicants are required to provide information on household characteristics, income, assets, and expenses that is used to determine the amount of money they need to pay in rent. In most instances, existing tenants must certify this information annually and, in some circumstances, they must recertify this information when there are significant changes in household income or composition. Applicant or tenant failure to correctly report income may result in HUD's over- or underpayment of housing assistance. The failure of the responsible program administrator to correctly interview the tenant or process and calculate the tenant's rental assistance may also result in HUD's over- or underpayment of rental assistance.

In 2000, HUD established a baseline error measurement to cover the three major types of rental housing assistance payment errors: (1) program administrator income and rent determination error; (2) intentional tenant misreporting of income (The Income Match Study); and (3) errors in program administrator billings for assistance payments. Eleven studies have been conducted to identify program administrator income and rent determination error. In addition to the 2000 study, studies were conducted in FY 2003 through FY 2012. The study referenced in this report covers FY 2012 and updates the FY 2011 measurement of errors in program administrator income and rent determinations. The tenant data collected for this study were also used to provide the sample for the Income Match Study to measure the extent of intentionally unreported

tenant income. The findings from the Income Match study are published as a separate report. This report relates solely to program administrator income and rent determination error.

For purposes of this study, "error" is defined as any rent calculation or eligibility determination that differs from what would have occurred if the PHA or other program administrator had followed all HUD income certification and rent calculation requirements during the initial certification or annual recertification conducted in FY 2012. When appropriate, study findings are compared with findings from the previous studies.

Financial Impact of Identifying Rent Error. Reduction in the rent error associated with the programs included in this study does not necessarily translate into an overall savings in the costs associated with administering these programs. Given the large number of eligible households on waiting lists, if a household leaves the program because it is no longer eligible for a subsidy, another household will take its place. The replacement household may be entitled to a smaller or a larger subsidy than the household that left the program. Therefore, the most direct benefit of identifying households with rent error is to ensure that households eligible for the program are receiving the correct subsidy, rather than reducing the amount of funds needed to administer the programs. The most appropriate use of this study is as a tool for strengthening HUD's procedures for ensuring administrative compliance with regulations. The implementation of recommendations presented in this report may require greater resources to provide HUD, PHAs, and owners with the written policy guidelines, training, standardized forms, and ongoing monitoring needed to ensure program compliance. The HUDQC Study assists the agency's objective of providing the right subsidies to the right families to sustain and support quality rental assistance programs for communities.

A. Methodology

HUD Requirements and Study Standards. Using the *Code of Federal Regulations* and official HUD handbooks and notices, ICF consolidated all HUD requirements relevant to the determination of rent into a set of HUD requirements. We invited program experts to participate in establishing and reviewing the standards used in this study.

The Sample. A nationally representative sample of 600 projects in the United States and Puerto Rico was selected from the universe of the three program types covered by the study:

- Public Housing
- PHA-administered Section 8 (Vouchers and Moderate Rehabilitation)
- Owner-administered Section 8, Section 202 Project Rental Assistance Contract (PRAC), Section 811 PRAC, Section 202/162 Project Assistance Contract (PAC)

A random sample of four households was selected for most projects, but more tenants were selected from unusually large projects. The final study data set includes responses from 2,404 households.

Out-of-Scope Projects. Certain programs were excluded from the study because their eligibility and rent calculation rules differed from the standards, including the Owner-administered Rental Assistance Payment (RAP), Rental Supplement Program (SUP) and Below Market Interest Rate

(BMIR) programs. For the FY 2012 study, Moving to Work (MTW) agencies were included in the sampling frame and sample for the first time. Universe files requested from HUD either excluded out-of-scope projects or were identified by HUD for easy removal.

Weighting. Population counts per program were calculated based on the assisted housing universe files provided by HUD in June 2012 to compile weights for the study. The same population totals per program, provided by HUD in the FY 2005 statement of work, were used from FY 2006 through FY 2010. In FY 2011 and 2012, the population totals were updated based on the FY 2011 and the FY 2012 HUDQC sample universe to better reflect the current population. Changes in total gross dollar error may be due to an increase in population, and not due to an increase in average dollar error. When comparing dollar error from FY 2011 to FY 2012, it is appropriate to compare average dollar error, which is not impacted by changes in population size.

The Data Collection Process. The data collection effort included creating and automating more than 35 data collection instruments; contacting and obtaining information from PHA/owner staff; hiring and training 64 field interviewers; and selecting the project and tenant sample. Field interviewers obtained data from tenant files and interviewed tenants using computer-assisted personal interviewing (CAPI) software developed for this study. The automated data collection process included built-in consistency and edit checks that prompted interviewers to probe inconsistent and anomalous responses. Collected data were electronically transferred daily to ICF headquarters for review. We also processed requested third-party verifications related to income, assets, and expenses.

Calculation of Rent Error. A quality control (QC) rent was calculated for each household in the sample using the information reported by the PHA/project, household, Social Security match, and third-party verification. Rent error was calculated by subtracting the QC rent from the actual paid tenant rent (the rent from Forms HUD-50058 or 50059 calculated by project staff). A discrepancy of $5 or less between the actual and QC rent was not counted as an error. This $5 differential was used to eliminate rounding differences and minor calculation discrepancies that have little effect on program-wide subsidy errors.

B. Major Rent Error Findings

National Rent Error Estimates. The analysis of the FY 2012 tenant files, tenant interview, and income verification data indicates that[1]:

- Seventy-two percent of all households paid the correct amount of rent within $5 (57% paid exactly the right amount);
- Sixteen percent of all households paid over $5 less than they should have (with an average error of $60 per month);
- Twelve percent of all households paid over $5 more than they should have (with an average error of $39 per month).

[1] Totals may not add up to 100% due to rounding.

Rent Error Estimates by Program Type. The rate of rent underpayments was highest, at 17 percent, in the PHA–administered Section 8 program, followed by the Owner-administered program with a 16 percent error, and the Public Housing program with 13 percent error. The PHA–administered Section 8 program also had the highest overpayment rate of 14 percent followed by Public Housing at 13 percent and the Owner-administered program at 9 percent. Exhibit ES-1 summarizes this information.

Exhibit ES-1
Frequency of Rent Error by Program Type

Administration Type	Rent Underpayment (Subsidy Overpayment)	Rent Overpayment (Subsidy Underpayment)
Public Housing	13%	13%
PHA-Administered Section 8	17%	14%
Owner-Administered	16%	9%
Total	**16%**	**12%**

Dollar Error Effect of Rent Errors. All summary error estimates represent the summation of net case-level errors, meaning that a case is determined to have a net overpayment error, no error, or a net underpayment error. Major findings were as follows[2]:

- **Rent underpayments of approximately $522.5 million annually (up from $469.5 million in FY 2011).** For tenants who paid less monthly rent than they should pay (16%), the average monthly underpayment was $60. For purposes of generalization, total underpayment errors spread across all households (including those with no error and overpayment error) produces a program-wide average monthly underpayment error of $9 ($110 annually). Multiplying and weighting the $110 by the approximately 4.7 million units represented by the study sample results in an overall annual underpayment dollar error of approximately $522.5 million per year.
- **Rent overpayments of approximately $276.3 million annually (up from $225.7 million in FY 2011).** For tenants who paid more monthly rent than they should pay (12%), the average monthly overpayment was $39. When this error is spread across all households it produces an average monthly overpayment of $5 ($60 annually). Multiplying and weighting the $60 by the approximately 4.7 million assisted housing units represented by the study sample results in an overall annual overpayment dollar error of approximately $276.3 million per year.
- **Aggregate net rent error of $246.2 million annually.** When combined, the average gross rent error per case is $14 ($9 + $5). Over- and underpayment errors partly offset each other; the net overall average monthly rent error is -$4 (-$9 + $5). HUD subsidies for Public Housing and PHA-administered Section 8 programs equal the allowed expense level or payment standard minus the tenant rent, which means that rent errors have a dollar-for-

[2] National annual totals in the text and exhibits are calculated using exact values and weighted. Household-level numbers are presented below; however, using them to calculate national annual totals will result in different amounts due to both rounding and weighting. Similarly, the source tables in Appendix C are rounded to the nearest integer for formatting purposes.

dollar correspondence with subsidy payment errors, except in the Public Housing program in years in which it is not fully funded (in which case, errors have slightly less than a dollar-for-dollar effect). The study found that the net subsidy cost of the under- and overpayments was approximately $246.2 million per year ($522.5 million–$276.3 million).

Subsidy over- and underpayment dollars are summarized in Exhibit ES-2. This information responds to study Objective 1 (i.e., identify the various types of errors, error rates and related estimated variances).

Exhibit ES-2
Subsidy Dollar Error

Type of Dollar Error	Subsidy Overpayment	Subsidy Underpayment
Average Monthly Per Tenant Error for Households with Errors	$60 (16% of cases)	$39 (12% of cases)
Average Monthly per Tenant Error Across all Households	$9	$5
Total Annual Program Errors[3]	$522.5 million	$276.3 million
Total Annual Errors (95% Confidence Interval)	**$393.6-$651.4 million**	**$206.5-$346.2 million**

Exhibit ES-3 provides estimates of program administrator error by program type. These data respond to study Objective 3 (i.e., provide estimates of national-level net costs for total errors and major error types); Objective 8 (i.e., provide information on the extent to which errors are concentrated in projects and programs); and Objective 11 (i.e., estimate total positive and negative errors in terms of HUD subsidies).

Exhibit ES-3
Estimates of Error in Program Administrator Income and Rent Determinations (in $1,000s)

Administration Type	Subsidy Overpayments	Subsidy Underpayments	Net Erroneous Payments	Gross Erroneous Payments
Public Housing	$188,049	$72,801	$45,248	$190,849
PHA-Administered Section 8	$272,915	$157,801	$115,113	$430,716
Total PHA-Administered	$390,964	$230,602	$160,362	$621,566
Owner-Administered	$131,523	$45,711	$85,811	$177,234
Total	**$522,486**	**$276,313**	**$246,173**	**$798,800**
95% Confidence Interval	**±$128,911**	**±$69,843**	**±$144,793**	**±$148,415**

Comparison with Prior Studies. Ten prior studies (the 2000 baseline study and annual studies since FY 2003) estimated erroneous payments attributed to program administrator rent calculation and processing errors using the same methodology, sampling procedures, and sample sizes as this FY 2012 study. While the FY 2003 and FY 2004 studies demonstrated significant reductions in erroneous payments attributed to program administrator income and rent determinations, the studies since that time have shown less dramatic changes in gross error.

[3] Estimates should be viewed in conjunction with 95% confidence intervals. Based on the sample, estimates may vary from year to year. Variations in estimates may not be statistically significant.

Comparing average dollar error in FY 2012 to FY 2011, there was no significant change in average dollar error overall and for each administration type. While the estimate for total gross dollar error increased from FY 2011 to FY 2012, the results of statistical analysis show that the change in the total and average gross dollar estimates for the QC study were due to an increase in the population totals due to the inclusion of the MTW population in FY 2012.[4,5] When comparing dollar error from year to year, average dollar error is the best estimate for comparison because it is not impacted by changes in population size. In addition, estimates may vary slightly from year to year based on the sample. Exhibit ES-4 presents a review of the gross erroneous payments for the QC studies from 2000 to FY 2012. Figure ES-1 graphically shows the progression of gross erroneous payments over time.

Exhibit ES-4
Comparative 2000 through FY 2012 Gross Erroneous Payments* (in 1000s)

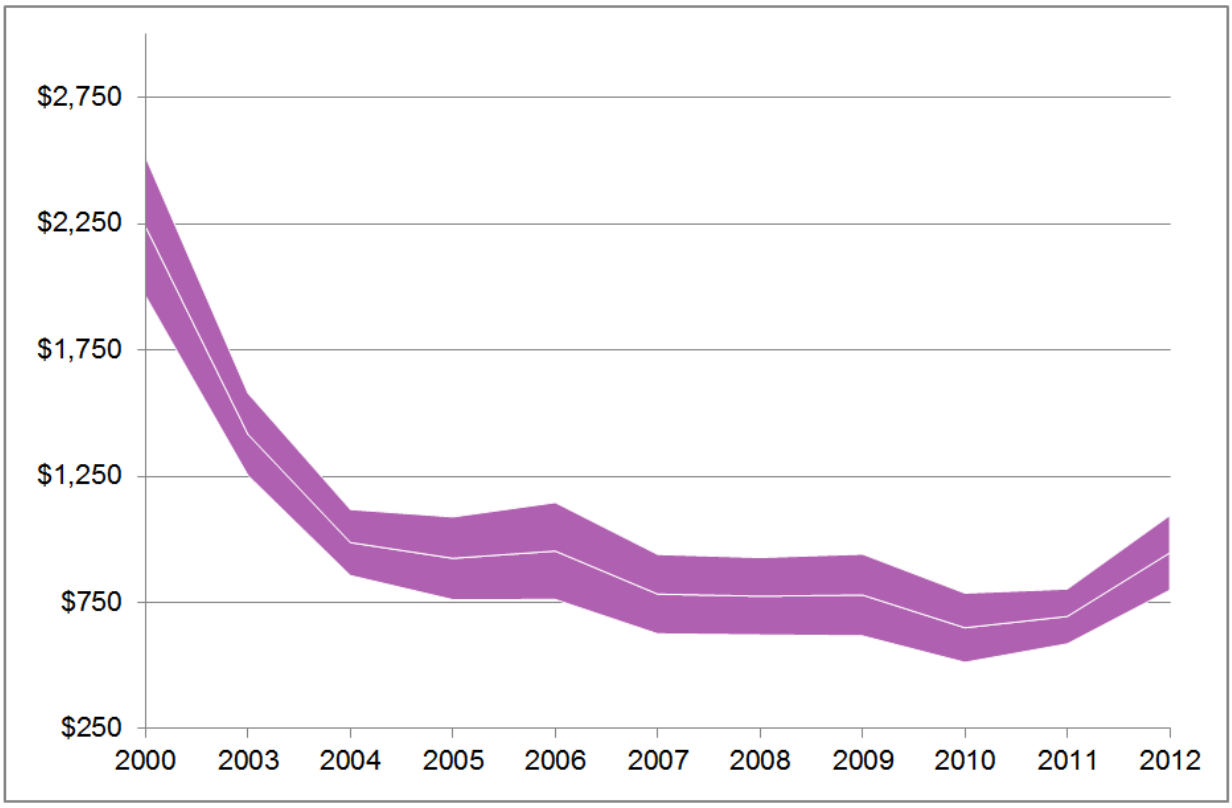
Study Year	Administration Type				Total
	Public Housing	PHA-Administered Section 8	Total PHA-Administered	Owner-Administered	
FY 2012°	$190,849	$430,716	$621,566	$177,234	$798,800 ±$148,415
FY 2011°	$139,885	$436,156	$576,041	$119,168	$695,209 ±$108,728
FY 2010	$141,033	$341,515	$482,548	$167,719	$650,266 ±$137,235
FY 2009	$130,268	$440,288	$570,556	$209,455	$780,011 ±$162,116
FY 2008	$183,305	$400,248	$583,553	$191,723	$775,276 ±$153,447
FY 2007	$149,364	$435,012	$584,376	$199,104	$783,480 ±$157,292
FY 2006	$172,824	$520,020	$692,844	$261,324	$954,168 ±$192,000
FY 2005	$220,464	$456,240	$676,704	$248,580	$925,232^ ±$164,000
FY 2004	$242,076	$521,220	$763,292	$224,460	$987,744^ (±$131,000)
FY 2003	$316,116	$730,956	$1,047,072	$368,796	$1,415,844^ (±$163,000)
2000	$602,556	$1,096,524	$1,699,092	$539,160	$2,238,252^ (±$275,000)
Percent Reduction from 2000 to FY 2011	68.33%	60.72%	63.42%	67.13%	64.31%

* Gross Rent Error is the sum of the absolute value of positive and negative rent error.
° In FY 2011 and FY 2012, the population totals were updated to reflect the current population. Increases in total gross dollar error are likely due to an increase in the total population size and not due to an increase in error.
^ Numbers may not add exactly due to rounding.

[4] In FY 2012, the population totals were updated based on the FY 2012 sampling frame. The new population totals included Moving to Work PHAs increased from around 4.3 million assisted housing units to around 4.7 million. Please refer to *Chapter 2: The Sample* and *Appendix B* for more details regarding this change.

[5] Please refer to Appendix C for more information about the impact of the change in population totals due to the inclusion of the MTW population in FY 2012 on error estimates.

Figure ES-1
Comparative 2000 through FY 2012 Gross Erroneous Payments over Time (in $1,000s)



Note: The white line illustrates the estimate and the purple shading reflects the statistical variance around the estimate.

C. Sources of Errors

Rent errors are often a result of a mix of different types of errors. In addition to dollar errors, this study also examined administrative and component errors. For the purposes of this study, administrative errors are analyzed separately from specific component errors.

Administrative Errors. Errors that result from administrative mistakes consist of the following:

- Consistency errors—errors in logical conformity between elements within Form HUD-50058 or Form HUD-50059
- Calculation errors—arithmetic errors within subsections of Form HUD-50058 or Form HUD-50059
- Transcription errors—errors in transferring information from documentation in the tenant file to Form HUD-50058 or Form HUD-50059
- Overdue recertification—failure to conduct a recertification in a timely manner
- Verification error—Failure to verify information

Component errors are related to the income and expense components used to calculate rent. The income components are employment income, Social Security benefits and pensions, public assistance, other income, and asset income. The expense and allowance components are the elderly and disabled allowance, dependent allowance, medical allowance, child care allowance, and disability allowance. Component errors often occur when project staff do not conduct a thorough tenant interview or do not verify the information obtained during the interview. However, component error may also occur when the tenant supplies incorrect information, either intentionally or unintentionally. The discussion below responds to study Objective 2 (i.e., identify the dollar costs of the various types of errors) and Objective 6 (i.e., determine the apparent cause of significant rent errors).

Consistency and Transcription Errors. The two most common administrative errors are transcription and consistency errors. The HUD PIC and TRACS data systems check the rent calculations on Forms HUD-50058 and 50059. For tenants for whom data are submitted (and corrected if required), these systems virtually eliminate rent determination calculation errors for the items included on the forms. However, not all cases are reported and some cases that are returned to program administrators for correction are ignored or are changed in the HUD systems but not actually implemented.

Overdue Recertifications. In general, HUD requires that every household be recertified annually. About one percent of households had overdue recertifications in FY 2012, which was about the same as in FY 2011.

Verification Errors. Recognizing the issues associated with verifying tenant information, HUD program staff members have taken steps to clarify, and to some extent simplify, verification guidelines. PIH Notice 2010-19, dated May 2010, and Housing Notice H 2010-10, dated July 2010, provide new procedures for obtaining and using verification. FY 2011 was the first fiscal year in which the new HUD verification guidelines applied. The new HUD guidelines were implemented at the end of FY 2010. In addition, based on a request from HUD staff, for the FY 2012 study, the date associated with the document used by the PHA/project staff was extended by approximately 2 months so that more documents in the tenant file met the HUDQC requirements.

Obtaining income verification is often difficult. Even when repeated requests are made, employers sometimes do not respond to requests for verification, or they require payment for the information. Some program sponsors do a much better job than others in achieving third-party compliance with written verification. The HUDQC Study shows that it is reasonable to expect all program administrators to have as high a success rate as the current high performers. The study also shows that there is significant room for improvement in using the verification data obtained.

Component Errors. Incorrect income and allowance amounts were by far the most significant sources of error in determining rents, while about 3 percent of households with rent errors did not have an income or expense component error. Earned income (28%), pensions (25%), medical allowances (15%), and other income (11%), and continued to have the greatest percentage of households in error. Exhibit ES-5 shows the frequency of the most serious component errors and the average dollar amount for each type. The percentage of households represents the households with any rent component error in which the specified rent component was responsible for the largest error. The Average Dollar Amount represents the average dollar amount for the specified

rent component for households in which the specified component was responsible for the largest error. For comparison purposes, findings from FY 2010 are provided in parentheses.

Exhibit ES-5
Rent Components Responsible for the Largest Dollar Error for Households with Rent Error

Rent Component	Percentage of Households	Annual Average Dollar Amount
Earned Income	28% (32%)	$4,632 ($3,881)
Pension	25% (16%)	$1,846 ($2,923)
Medical Allowance	15% (15%)	$1,049 ($832)
Other Income	11% (16%)	$3,599 ($3,118)
Dependent Allowance	6% (3%)	$519 ($580)
Public Assistance	6% (8%)	$2,706 ($1,906)
Elderly/Disabled Allowance	3% (2%)	$400 ($400)
Asset Income	2% (2%)	$684 ($613)
Child Care Allowance	2% (3%)	$2,626 ($2,237)
Disability Allowance	<1% (0%)	$4,528 ($0)
No Rent Component Error	3% (3%)	$0
Total	**100%**	**$2,555 ($2,594)***

* The sum of the dollars associated with the largest component in error divided by the number of households with that error.
Note: FY 2011 findings are provided in parentheses. The cell size for elderly/disabled allowance is small, thus, estimates may not be reliable.

Exhibit ES-6 displays the impact of changes in the error threshold on the case error rate and gross dollar error. Currently, monthly error of less than $5 is ignored due to rounding. An increase in the error threshold of $5 to $10 would result in an increase in proper payments by about 5 percent, as well as a decrease in the estimate for gross dollar error by about $24.3 million. Based on the distribution of household error, most rent errors are within $100 per month, or $1,200 per year. While at the individual household level the gross error may seem insignificant, the errors can result in a substantial amount of gross dollar error for the assisted housing programs in aggregate. While an increase in the error threshold to $100 per month would result in 96 percent of cases being proper payments, the increased error threshold would not capture most errors associated with improper payments.

Exhibit ES-6
Impact of Changes in the Error Threshold on Frequency and Estimates of Error (in $1,000s)

Monthly Error	Percentages of Households			Dollar Error Amount			
	Rent Under-payment	Proper Payment	Rent Over-payment	Rent Under-payment	Rent Over-payment	Gross Error	Net Error
Exact Match	21.0%	56.8%	22.1%	$529,115	$285,899	$815,015	-$243,216
Within $5	15.5%	72.2%	12.4%	$522,486	$276,313	$798,800	-$246,173
Within $10	13.0%	77.7%	9.3%	$511,814	$262,210	$774,024	-$249,604
Within $15	10.9%	82.7%	6.5%	$496,400	$242,713	$739,113	-$253,687
Within $25	7.8%	87.4%	4.8%	$460,021	$223,035	$683,056	-$236,986
Within $50	4.2%	93.4%	2.4%	$387,350	$173,450	$560,801	-$213,900
Within $100	2.3%	96.4%	1.3%	$305,934	$131,215	$437,149	-$174,720

D. Additional Findings

Eligibility of Newly Certified Households. A separate analysis of newly certified households (11%) was conducted to determine whether these households were eligible for HUD housing assistance. Ninety-five percent of these households met all the eligibility criteria; the same percent as in FY 2011. All certified households in the sample were income-eligible on the basis of the QC income determination.

One percent of the newly certified households failed to document Social Security numbers for one or more family members and 5 percent lacked the signed consent forms needed to authorize verification of income and assets (for each member of the household at least 18 years of age). All households had the signed declaration forms or evidence accepted as proof of citizenship. These findings respond to study Objective 9 (i.e., estimate the percentage of newly certified tenants who were incorrectly determined eligible for program admission).

Occupancy Standards. Study Objective 7 asks for the extent to which households are under or over housed relative to HUD's occupancy standards. Sixteen percent of all households occupied a unit with too many or too few bedrooms in FY 2012, according to the guidelines used for this study. Historically, the percent of households in units with the correct number of bedrooms according to study guidelines have fluctuated between 83 and 88 percent since FY 2004.

Rent Reasonableness. Study Objective 10 asks for the extent to which PHA-administered Section 8 Voucher rent comparability (reasonableness) determinations are found in the tenant file, and the method used to support the determinations. Eighty-one percent of new admission files contained rent reasonableness documents, as did 76 percent of the files for households for which data were collected for an annual recertification. However, the absence of documentation does not necessarily indicate a determination was not completed; only that it was not properly documented. Information was also collected at the PHA level to understand the method used to determine rent reasonableness. To determine whether the rent was reasonable, about 91 percent of the PHAs in the study used unit-to-unit rent comparison, unit-to-market rent comparison, or a point system. For the remaining 9 percent, there was either no information available, the PHA used some other method of determining rent reasonableness, or the units were subject to rent control.

Utility Allowances. For PHA-administered Section 8 Voucher households, the utility allowances found on Form HUD-50058 were compared to the utility allowance worksheets found in the tenant file, and to the utility allowance values calculated using the utility allowance schedules provided by the PHAs. For the first comparison, 93 percent of the utility allowance values matched. For the second comparison, 94 percent of the values matched. However, nonmatching values may not necessarily mean the utility allowance found on Form HUD-50058 was incorrect.

Payment Standards. A special analysis was conducted to determine whether the correct payment standards were used for PHA-administered Section 8 Voucher households. The payment standard found on Form HUD-50058 was compared to the payment standard schedules provided by the PHA, and to the Fair Market Rent (FMR) for the appropriate geographical area. For the first comparison, 84 percent of the payment standards matched. For the second comparison, 91 percent of the payment standards found on Form HUD-50058 fell within the 90 to 110 percent FMR band. As with the utility allowance analysis, the information needed to conduct the analysis was not always available. Therefore, because the payment standards did not match does not necessarily mean the incorrect payment standard was used when calculating the amount of the tenant rent.

Form HUD-50058/50059 Rent Calculation Error. The tenant rent was calculated using only data on Forms HUD-50058/50059 to determine the relationship between errors detected using Forms HUD-50058/50059 and total rent errors found in the study (in response to study Objective 4). When using only Form HUD-50058/50059 data to calculate rent, errors were found in 11 percent of the households. This is clearly different than the QC error calculation in which errors were found in 29 percent of the households. In addition, error was found in both Form HUD-50058/50059 and QC calculation in only 3 percent of the households.

Automated Rent Calculation Systems. Study Objective 12 asks whether error rates in projects that use an automated rent calculation system differ from errors in those using other or calculation methods. We did not find a difference between PHAs/projects that use automated rent calculation systems and those that do not. This is not surprising because nearly all PHAs/projects use an automated rent calculation system of some kind.

Tenant Characteristics, and Project Characteristics and Practices. The FY 2012 HUDQC multivariate modeling followed the conceptual and analytical approaches used in previous years, with some technical changes. The analysis identified large patterns in which rent errors related to project and household variables. The patterns were essentially similar to those reported in previous analyses, except that housing program types indicated no statistically significant difference in gross rent error, subsidy overpayment, underpayment, net other project and household effects.

Project-caused errors accounted for a large proportion of gross rent error, controlling for other effects. Of the project-caused errors, transcription errors, overdue recertification errors, the rate of items with transcription error, and the rate of items without third-party written verification predicted a higher gross error. Transcription error was a source of high subsidy overpayment and underpayment as well. The rate of items with transcription error related to higher overpayment and underpayment, and the binary-coded transcription error related to higher subsidy overpayment.

Calculation errors, an indicator of numerous subtypes of calculation mistakes, were found related to lower gross rent error and underpayment error in a moderate but statistically significant way.

This finding seems to imply that calculation processes might generate errors that offset each other, ending up with an average lower rent error; further examination is needed to better understand this relationship. The major findings on effects of project-caused errors were comparable with those from previous years' analyses (i.e., FY 2008–FY 2011), underscoring the importance of reducing project-made errors, particularly, transcription errors and overdue recertification, in minimizing rent errors.

E. HUD Initiatives: 2000–2012

In response to the findings and recommendations of the 2000 Assisted Housing Quality Control Study, HUD initiated a series of aggressive actions to address the causes of erroneous assistance payments, including extensive onsite monitoring. Actions taken by HUD included the following:

- A Rental Housing Integrity Improvement Program (RHIIP) committee, headed by the Office of the Chief Financial Officer with representatives from other affected offices, was formed to coordinate and monitor corrective actions. The committee meets to review progress, and identify and resolve impediments to progress in reducing errors.
- The Offices of Housing and Public and Indian Housing developed and issued new handbooks and instructional material that detailed all current HUD program requirements and standardized them to the extent possible without regulatory or statutory change. These handbooks cover nearly all aspects of occupancy policy from the point of tenant application for admission and rent calculations through ongoing occupancy to lease termination. For Public Housing, the issuance of a Public Housing Occupancy Guidebook represented the first such effort in more than 20 years and provided a defined methodology for calculating a number of complex requirements (e.g., the Earned Income Disallowance).
- The Offices of Housing and Public and Indian Housing substantially increased training efforts and held a number of national and regional training sessions. This contrasts with a less activist role in the 1980s and 1990s.
- The Offices of Housing and Public and Indian Housing initiated comprehensive, large-scale, and onsite occupancy and management reviews, which also represented a major procedural change from the previous two decades for most HUD offices.
    - The Office of Housing primarily used new agreements with Contract Administrators, which are usually state agencies, to perform this function. Contract Administrators provide technical support in adhering to HUD program requirements and routinely perform detailed monitoring on agency compliance.
    - The Office of Public and Indian Housing initiated a system of Rental Integrity Monitoring (RIM) reviews to detect and reduce errors in income and rent calculations at targeted PHAs, reduce rent under- and/or overpayments by residents, and ensure that HUD's limited housing resources were being used to serve eligible families in a fair and equitable manner as intended by Congress.
- HUD initiated a legislative change that gives it access to the U.S. Department of Health and Human Services (HHS) National Directory of New Hires (NDNH) income and wage database for income matching purposes. It uses these data to compare tenant-reported income with state wage data to better ensure that the right subsidy payments are made to

the right households in accordance with program statutory and regulatory requirements. This legislation was passed in late 2003 and required implementation of agreements and data systems. HUD also negotiated agreements with some states to obtain access to the same information. Access to the NDNH database is available through the Enterprise Income Verification (EIV) System.

- The Offices of Housing and Public and Indian Housing initiated a computer matching program with the Social Security Administration (SSA) that provides SSA data for tenants receiving assisted housing. SSA electronically provides HUD with benefit information on all active household members who have disclosed a valid social security number. HUD makes this information available to administrators of the Public Housing and Section 8 programs through the EIV system. This information allows PHAs to validate social security numbers and SSA benefits quickly and efficiently.
- In 2010, HUD issued the *Implementation of Refinement of Income and Rent Rule,* which mandated the use of the EIV system (discussed in the previous two bullets) as a third-party source to verify tenant employment and income information during mandatory recertification of family composition and income. The use of EIV minimizes the need for traditional, third-party verification forms. To make the EIV system as effective as possible, the rule was also revised to require all applicants and participants to disclose a social security number, no longer exempting children under the age of six.

HUD's performance goals, which were developed in consultation with the Office of Management and Budget (OMB), called for reducing the 2000 benchmark assisted housing error levels by 50 percent by the end of 2005. The study of program administrator error for FY 2005 showed that HUD exceeded this goal, and has since further decreased error. It should be noted, however, that the reduction of errors and improper payments is unlikely to have an equivalent effect on budget outlays. HUD's experience has been that program integrity improvement efforts are likely to result in some higher-income tenants leaving assisted housing and being replaced with lower-income tenants requiring increased outlays. Nevertheless, HUD's goal remains to ensure that the right benefits go to the right people.

F. Recommendations

HUD's progress in decreasing improper payment since FY 2000 is impressive. A comparison of the FY 2012 gross erroneous payments with those in FY 2000 shows a 63 percent reduction. On the basis of the current study's results, we recommend the following approaches to further reduce income and rent determination error rates:

1. HUD should continue use the HHS New Hires income matching database. However, access to the New Hires income matching database by itself will not result in a reduction in error. PHA/project staff must use this information to assist them in resolving discrepancies between reported information in the New Hires income matching database and tenant-reported information.
2. HUD should continue to use the EIV system to reduce the level of improper payments. Increased use of EIV may help reduce errors associated with income reporting and assist in recovering payment errors. EIV is a proven strategy that should be maintained in

conjunction with other income verification methods that capture more current and other sources of income data.

3. HUD should continue expanding support of the occupancy function and conducting outreach campaigns to PHAs and owners, informing them of the Department's occupancy-related resources.
4. HUD should continue to provide PHAs and owners with the forms, training, and other tools required to determine rent correctly and to assist them in resolving discrepancies. Changes in policy should be reported to PHAs and owners in a timely fashion with the guidance, and local trainings conducted wherever possible in order to implement those changes in an accurate manner. HUD should consider creating a handbook that combines or cross references the rules and regulations for all rental assistance programs administered by HUD. The Earned Income Disregard is one example of a difficult rule where PHA/owners would benefit from clearer guidelines and training materials.
5. HUD should continue to implement and expand the scope and depth of its onsite monitoring program by utilizing experienced, knowledgeable HUD staff, or competent contract staff. PHAs and owners should be held accountable for implementing HUD regulations and calculating rent accurately.
6. Federal laws, regulations, and HUD requirements should be simplified, to the extent possible.
7. HUD should consider implementing policy that allows re-examinations, for selected populations, to be completed less often than annually.

In addition, the HUDQC Study could be modified to supplement the findings from this study and identify options for reducing error in the future. The following are possible methods to achieve this goal:

1. Conduct updated studies to ascertain the billing error associated with the Public Housing, Section 8 Housing Choice Vouchers and Moderate Rehabilitation, and Owner-administered programs. Current error estimates could be obtained by conducting primary data collection or by using statistical modeling to update the existing information. In the FY 2012 HUD Agency Financial Report, billing error estimates are based on FY 2004 data for the Public Housing program and FY 2009 data for the Owner-administered program.
2. Consider conducting an in-depth quality control study of how utility allowance values are calculated and used in the rent calculation. Such a study could involve collecting data from utility companies regarding utility usage for a given fiscal year and comparing actual consumption with the utility allowance values calculated by project staff. This investigation could also include an evaluation of the HUD Utility Schedule Model (HUSM) and its ability to accurately estimate utility costs for assisted housing tenants.
3. Consider conducting remote data collection with national estimates and a larger number of households per project, in which PHAs/projects mail copies of the tenant file to study headquarters. Eliminating a field data collection would eliminate the need to travel and the costs associated with travel, allowing for a stratified sample that would increase the precision of the national estimates, as well as potentially provide better project-level information.

4. Collect more information regarding PHA/project policies and practices. Each PHA establishes its own policies, procedures, and forms for collecting the information that are ultimately used to calculate tenant rent. The differentiation in these practices may have some (possibly major) impact on the rent error, yet the analysis of the project practices and characteristics collected in the Project Staff Questionnaire designed for this study do not demonstrate the expected impact. Focus groups and cognitive interviewing could be used to identify additional PHA/project-level factors that may impact error. This additional information could be used to revise the Project Staff Questionnaire to include questions focused on the specific practices expected to influence errors.
5. Gather information to document the outcome of the HUD quality control studies. Overall, the HUDQC studies indicate that both the percent of errors and dollars associated with those errors have decreased since FY 2000. However, there is no information on changes in tenant behavior related to the identification and reduction of error. To fully understand the overall impact of the quality control studies on subsidy funding, additional information is needed regarding both the tenants receiving the subsidies and the PHAs/projects administering the housing benefits.
6. Expand contractor access to verification obtained through Social Security Administration and National Directory of New Hires data. Despite increasing rates of third-party verification, a substantial proportion of tenant income and expenses are not being verified. This is especially important given the study results indicate a significant relationship between third-party verification and certain types of income and rent errors. Expanded access to Federal databases would allow the contractor to investigate discrepancies between information on Form HUD-50058/50059 and the tenant file.
7. Continue to investigate PIC/TRACS data for sampling and other purposes. Ideally PIC/TRACS data would be used to select the quality control sample and provide the actual data used by the PHA/project staff when calculating rent (in place of abstracting Form HUD-50058/50059 data from the tenant file). However, to implement this, the data must be available for the specific period of time covered by the study.
8. Continue the HUD quality control studies as a regular, ongoing effort to monitor and manage HUD rent determination processes. Ongoing evaluation of the subsidy programs administered by HUD is essential to the management of those programs. Although the primary goal of these studies is to measure rent errors, the studies also give HUD the opportunity to learn more about alternatives to reduce rent errors and better management of current and changing conditions at PHAs/projects.

I. INTRODUCTION

The U.S. Department of Housing and Urban Development (HUD) provides housing subsidies to multifamily project owners and public housing authorities to administer housing assistance primarily to low-income households. The Office of Public and Indian Housing (PIH) and the Office of Multifamily Housing provide funding for rental subsidy through Public Housing, the Section 8 Housing Choice Voucher program, and the Owner-administered Section 8 project-based programs. Collectively these programs are referred to as HUD's Rental Housing Assistance Programs (RHAP). They are administered by more than 4,058 intermediary agencies and provide affordable housing for approximately 4.5 million households (1.1 million though public housing, 2.3 million through the HCV program, and 1.1 million through project-based program).[6]

Under the Improper Payments Elimination and Recovery Act (IPERA), signed into law in 2010, and guidance of the Office of Management and Budget (OMB), agencies are responsible for assessing all programs they administer and for identifying those that may be susceptible to improper payments. An "improper payment" is any payment that should not have been made or that was made in an incorrect amount. In FY 2011, $31.9 billion, or 32 percent, of HUD's total payments were attributed to HUD's rental assistance programs. These programs constitute a significant amount of HUD's total payments and continue to be assessed as being at high risk of significant improper payments.[7]

During this challenging economic period, evaluating program administration and internal controls to maintain sustainable, quality programs that meet the needs of communities is more important than ever. The reduction of improper payments directly impacts the number of eligible participants who can benefit from HUD's rental assistance programs; it frees up additional resources that can be allocated to increase the number of low-income households served through HUD programs. The purpose of the HUDQC Study, some background information on the study, and the organization of the report are outlined in this section.

A. Purpose of the Quality Control for Rental Assistance Subsidy Determinations Study for FY 2012

ICF[8] was contracted to perform the HUDQC Study to support HUD's continued dedication to reducing the amount of annual improper payments in its programs and to comply with the reporting and administrative requirements under IPERA. The HUDQC Study provides national estimates of the level of improper payments and rent calculation error in tenant subsidies for Public Housing, Section 8 Housing Choice Voucher and Moderate Rehabilitation programs, and the

[6] U.S. Department of Housing and Urban Development. *Annual Report: FY 2012 Agency Financial Report.* Washington, DC: U.S. Department of Housing and Urban Development, 2012, pg. 163.

[7] U.S. Department of Housing and Urban Development. *Annual Report: FY 2012 Agency Financial Report.* Washington, DC: U.S. Department of Housing and Urban Development, 2012, pg. 190.

[8] From May 1999 through December 2006, Macro International Inc. was a wholly owned subsidiary of Opinion Research Corporation (ORC) and conducted business under the name ORC Macro. In March 2009, Macro International Inc. was acquired by ICF International. It operated as a wholly owned subsidiary under the name ICF Macro until fall 2011. Today, ICF Macro has been fully integrated and now operates under the name ICF International (ICF).

Owner-administered Section 8, Section 202 and Section 811 Project Rental Assistance Contracts (PRAC) and Section 202/162 Project Assistance Contracts (PAC) programs. For the purpose of this study, "error" is defined as any rent calculation or eligibility decision that is determined based on methods discrepant from HUD's income certification and rent calculation requirements. The study examines the sources, costs associated with, and the frequency of subsidy errors in tenant certification and annual recertification processes for recertification transactions conducted during federal fiscal year 2012.[9]

Out of the 17 study objectives HUD has outlined, a total of 15 objectives are examined in this report. The findings for the Income Match Study, objective number 15, has been published and presented to HUD in a separate report cover; and a review of billing errors in Multifamily Housing Programs, identified under objective number 17, was not conducted for the FY 2012 study. As part of our review, we compared unit size to household size to identify any errors in the determination of unit size. We also collected and analyzed information pertaining to eligibility and rent determination processes to identify possible causes of error in rent calculation. In addition, some special analyses were conducted in regard to PHA utility allowances, payment standards and rent reasonableness practices which provided additional estimates of error for our review of the 20 largest PHAs included in the study.

B. Study Background

Three major components of potential errors in HUD's rental housing assistance programs which could result in rent calculation error and improper payments include:

- Program administrator error is the program administrator's failure to correctly determine eligibility, income, and to apply all income exclusions and deductions when conducting the recertification.
- Tenant income reporting error is a consequence of the tenant's failure to disclose all income sources and eligibility related items.
- Billing error occurs when there is incorrect billing and payment of subsidies between HUD and third-party program administrators and/or housing providers.

As an indicator of overall program health, HUD has annually reported the amount of improper rental assistance payments in their agency financial reports. The chart below shows some of the results of their findings over a number of years.

[9] PHAs and owners of HUD-assisted housing are required to make an initial determination of eligibility, and, thereafter, an annual recertification of each household's rent. In this report, the term "recertification" refers to the initial certification and annual recertification. Interim recertification transactions were not included in this study.

Improper Rental Assistance Payments[10] (in $1,000s)

Administration/ Error Type	2011 Gross Erroneous Payments	2010 Gross Erroneous Payments	2009 Gross Erroneous Payments	2008 Gross Erroneous Payments	2000 Gross Erroneous Payments
Public Housing					
Administrator Error	$139,885	$141,033	……	……	$602,557
Income Reporting Error	$78,622	$45,433	……	……	$294,000
Subtotal:	**$218,507**	**$186,466**	**……**	**……**	**$896,557**
Section 8 Voucher					
Administrator Error	$436,155	$341,515	$440,288	$400,248	$1,096,535
Income Reporting Error	$265,696	$86,709	$121,477	$232,557	$418,000
Subtotal:	**$701,751**	**$428,224**	**$561,765**	**$632,805**	**$1,514,535**
Total PHA-Administered					
Administrator Error	$576,040	$482,548	$440,288	$400,248	$1,699,092
Income Reporting Error	$344,318	$132,142	$121,477	$232,557	$712,000
Subtotal:	**$920,358**	**$614,690**	**$561,765**	**$632,805**	**$2,411,092**
Total Project Based/Owner-Administered					
Administrator Error	$119,168	$167,719	$209,455	$191,724	$539,160
Income Reporting Error	$84,175	$71,056	$96,326	$138,143	$266,000
Subtotal:	**$203,343**	**$238,775**	**$305,781**	**$329,867**	**$805,160**
Total Improper Payments					
Administrator Error	$695,208	$650,267	$649,743	$591,972	$2,238,252
Income Reporting Error	$428,493	$203,198	$217,803	$370,700	$978,000
Total:	**$1,123,701**	**$853,465**	**$867,546**	**$962,672**	**$3,216,252**

A billing study is not performed every year and data on this third major component of rent error are not included in the Improper Rental Assistance Payments chart above. The Multifamily Housing Billing Study was excluded from the FY 2012 HUDQC Study, but the billing error for FY 2011 was estimated to be $106 million, using billing error estimates for Public Housing and Owner-administered project-based assistance programs.[11]

[10] Data for 2000, 2010, and 2011 are from the *Annual Report: FY 2012 Agency Financial Report,* pg. 192. Data for 2008 and 2009 were taken from *Annual Report: FY 2010 Agency Financial Report*, pg. 174.

[11] U.S. Department of Housing and Urban Development. *Annual Report: FY 2012 Agency Financial Report.* Washington, DC: U.S. Department of Housing and Urban Development, 2012. pg. 191.

As illustrated in the above chart, HUD has reduced the combined baseline gross improper payment estimates of $3.22 billion to $1.12 billion[12] from FY 2000 to FY 2011, a reduction of 66 percent. Although overall improper payments estimates in the chart were determined by HUD, most of the data used to calculate these estimates derive from the annual HUDQC Study.

The FY 2012 HUDQC Study is the eleventh in a series of studies designed to:

- identify potential metrics for improper payments error, including HUD eligibility determination, income calculation, and rent calculation;
- translate regulations for HUD administration types (Public Housing, PHA-administered Section 8, and Owner-administered projects) into data collection and survey instruments;
- develop an error-detection system for flagging inconsistencies in household data and establishing an internal quality control process for data collectors;
- provide nationally representative estimates of rent subsidy errors.

Activities for the FY 2012 HUDQC Study commenced in December 2012, starting the review of certification transactions effective November 1, 2011 to October 31, 2012. Tasks completed prior to data collection that have not been listed above included designing the research and survey methodology and automating the data collection process. Data were collected from a nationally representative sample of HUD-assisted housing projects and participant household data were collected from tenant files, household interviews and, when necessary, from third-party verification.

C. Organization of This Report

This report is organized with following sections:

- Section I: Introduction
- Section II: Methodology
- Section III: Study Objectives and Analytic Methods
- Section IV: Findings
- Section V: Recommendations
- Appendices
  - Appendix A: Rent Calculations
  - Appendix B: Weighting Procedures
  - Appendix C: MTW Population and Error Estimates
  - Appendix D: Source Tables

[12] These figures combine the FY 2000 baseline estimate of $3.22 billion for two types of improper payments (i.e. program administrator and tenant income reporting error) with the FY 2011 baseline estimate of $1.12 billion, based on the same two types of improper payments.

- Appendix E: Consistency and Calculation Errors
- Appendix F: Project Staff Questionnaire Analysis
- Appendix G: Multivariate Analysis

D. Definitions of Key Terms

The HUDQC Study has some key terms that are used for the study of RHAP rent calculation error and improper payments. These key terms are used throughout the report and can be referenced here:

- **Actual Rent (AC Rent)—**the tenant rent listed on Form HUD-50058 or Form HUD-50059
- **Administration Type—**PHA or owner
- **Abstract Month—**the month in which the data collection process for any given household was initiated
- **Calculation Errors—**arithmetic errors within subsections of Form HUD-50058 or Form HUD-50059
- **Case Type—**certification, recertification, and overdue recertification
- **Component Errors—**the income components (i.e., employment income, Social Security and pensions, public assistance, other income, and asset income) and deduction components (i.e., elderly/disabled allowance, dependent allowance, medical expenses, child care expenses, and disability expense) responsible for an error in rent calculation
- **Consistency Errors—**errors in logical conformity between elements within Form HUD-50058 or 50059 Form
- **Dollar Rent Error—**calculated at the household level by subtracting the household's QC Rent (see definition below) from the AC Rent
- **Error Rate—**the sum of the dollar amount of Rent Error divided by the sum of the dollar amount of the QC Rent
- **Gross Rent Error—**the sum of the absolute values of over- and underpayments
- **Largest Component Dollar Error—**the annual dollar amount of error in the component with the largest error
- **Net Rent Error—**the arithmetic sum of over- and underpayments
- **(Rent) Overpayment—**results when the household paid more than it should have paid, making HUD's contribution less than it should have been
- **Payment Type—**underpayment, proper payment, and overpayment
- **Program Type—**Public Housing, Section 8 Housing Choice Voucher, Section 8 Moderate Rehabilitation, Section 8 project-based, Section 202 PRAC, Section 811 PRAC, and Section 202/162 PAC

- **Quality Control Month (QCM)—**the month in which the PHA/owner completed the rent calculation
- **Quality Control (QC) Rent—**calculated by ICF using the tenant file, household interview, and verification data
- **Rent Component—**one of the five sources of income (i.e., earned, pensions, public assistance, other income, and assets) or the five types of deductions (i.e., medical, child care, disability assistance expenses, dependent allowance, and elderly/disabled allowance)
- **Rent Error—**the difference between the monthly AC Rent and the monthly QC Rent
- **Total Component Dollars in Error—**the absolute sum (i.e., the sum of the positive and negative amounts, ignoring the plus or minus signs) of all individual income and expense component errors, combined to provide an overall Total Dollars in Error and presented as an annual amount
- **Transcription Errors—**errors in transferring information from documentation in the tenant file to Form HUD-50058 or Form HUD-50059
- **(Rent) Underpayment—**results when the household paid less than it should have paid, making HUD's contribution higher than it should have been

II. METHODOLOGY

A. HUD Requirements and Study Standards

ICF used the *Code of Federal Regulations* and official HUD handbooks and notices to consolidate all HUD rules relevant to the determination of rent into a set of HUD requirements. We used these requirements to create a uniform set of rules that could identify errors in eligibility determination, rent calculation, and unit assignment for the housing programs in the study. In general, this uniform set of rules—known as the standards—follows the official HUD requirements. However, for some complex requirements, standardized procedures were developed to allow a uniform manner of data collection. A complete list of standards used in this study can be found in the *Data Collection Standards for the FY 2012 HUDQC Study, Quality Control for Rental Assistance Subsidy Determinations*.[13]

B. The Sample

The initial sampling design called for a nationally representative sample of 600 projects with four households randomly selected from each project, equaling 2,400 households. We selected projects with probabilities proportional to size (PPS), but 8, 12, or more households were selected from larger projects whose size exceeded the sampling interval; these were counted as more than one project for the purpose of determining the sample size. The sampling design required approximately equal allocations for the three assisted program types: Public Housing, PHA-administered Section 8 (Vouchers and Moderate Rehabilitation), and Owner-administered (Section 8, Section 202 PRAC, Section 202/162 PAC, and Section 811 PRAC). Certain projects were excluded from the study due to their different eligibility and rent calculation rules, such as Owner-administered RAP/SUP projects. Universe files requested from HUD either excluded out-of-scope projects, or were identified for easy removal. Because some large projects were selected multiple times, the study sample included 554 distinct projects in 59 geographic areas across the United States and Puerto Rico. We sampled 200 projects from each major program type[14] and collected data for a multiple of four households from each project. An additional project was added to the sample to ensure that, given any unexpected circumstances, the sample would include a minimum of 2,400 households. The final data set includes responses from 2,404 households in 554 projects.

The tenant sample was selected from all households that received assistance in Federal FY 2012. A random sample of four households was selected from most projects. An equal number of "replacement" households were identified as potential substitutes in the event that selected households did not meet the study requirements or were unavailable to be interviewed. For example, 10 PHA-administered Section 8 Voucher projects had household sample sizes of 12 or greater, including those in New York City and Los Angeles.

[13] ICF International unpublished report to HUD dated August 3, 2012.

[14] For the purpose of this study, a "project" for the Section 8 Voucher Program is defined as the administration of the program in one county/township. Therefore, if a PHA administers vouchers in more than one county/township, the PHA could be represented in this study by more than one "project."

Once the sample for the QC study was identified, additional projects and households were selected for the 20 largest PHAs in the QC study sample. This additional sample allowed us to provide supplemental findings for these large PHAs. At least 32 cases were sampled per PHA. If a PHA's QC study sample size was sufficiently large, we did not supplement it; however, if only a few households were sampled from the PHA, we added substantially to the sample. As in the QC study, we allowed vouchers to be selected more than once. Since we selected households in groups of four, we aimed for eight projects per PHA with possible multiple selections for the PHA-administered Section 8 Voucher and Moderate Rehabilitation projects. The resulting sample yielded 55 new projects that were not selected for the QC study and 284 new households. For additional information on the sampling procedures, see the *Sampling Plan for the FY 2012 HUDQC Study, Quality Control for Rental Assistance Subsidy Determinations*.[15]

Weighting. For the FY 2012 study, we determined the population counts for each program to enable the compilation of weights.[16] For the FY 2004 to FY 2010 studies, due to the difference in their eligibility and rent calculation rules, Owner-administered RAP/SUP projects and Moving to Work (MTW) projects in Public Housing and Voucher programs were excluded from the population totals. For FY 2012, however, MTW projects were included in the study per HUD request. More information about the impact of the change in population totals due to the inclusion of MTW population in FY 2012 on error estimates can be found in Appendix C.

For the FY 2005 to FY 2010 studies, the population totals from the June 13, 2005 request for proposal (RFP) were used as the basis for the estimate of occupied units in each of the programs. In FY 2011, a comparison of the population totals used for the FY 2005 through FY 2010 studies and the FY 2011 frame population totals showed that the population changed sufficiently enough to warrant updating the population counts. Exhibit II-1 compares the population totals used for the FY 2005 through FY 2010 studies, the FY 2011 study, and the FY 2012 sample. As the exhibit shows, the population has increased from FY 2011 to FY 2012 due to the inclusion of MTW projects.

Exhibit II-1
Change in Population Totals over Time

Administration Type	FY 2005–FY 2010 Population Totals	FY 2011 Population Totals	FY 2011 Population Totals	Percent Increase in Population Totals from FY 2011 to FY 2012
Public Housing Total	955,000	1,052,503	1,154,796	+9.72%
Public Housing (non-MTW)	955,000	1,052,503	1,040,708	-1.12%
Public Housing (MTW)	0	0	114,088	
PHA-Administered Section 8 Total	1,858,000	1,912,467	2,198,722	+14.97%
PHA-Administered Section 8 (non-MTW)	1,858,000	1,912,467	1,935,597	+1.21%
PHA-Administered Section 8 (MTW)	0	0	263,125	
Owner-Administered	1,320,000	1,382,670	1,378,158	-0.33%
Total	**4,133,000**	**4,347,640**	**4,731,676**	+8.83%

[15] ICF unpublished report to HUD dated July 13, 2012.

[16] For a more detailed discussion regarding population total updates, please reference Appendix B.

The use of the same population counts increases comparability of the data, so that any change from year to year would not be due to a change in the number of households in the program, but to an actual change in the average gross dollar error or percentage of households that are in error. However, maintaining constant population counts over time despite changes in the population itself may result in estimates for total dollar amounts and the proportion of the population represented by each program type not being representative of the current population. Based on the above, given the inclusion of MTW projects in the FY 2012 sample and with HUD's agreement, ICF updated the population counts for the FY 2012 study.

C. Data Collection

This study used a multistage data collection process to obtain all required information. Web surveys provided project-level information from PHA/project staff. Tenant-level information was obtained by field interviewers who abstracted data from the household file, interviewed households, and requested verification for income, expense, and household composition items from third parties.[17] Tenant income, expense, allowance, and third-party verification information were collected using HUD-sanctioned data collection procedures. The initial collection of project-level data began in September 2012 with the Web-based Project Specific Information (PSI) questionnaire. Another Web-based survey, the Project Staff Questionnaire (PSQ) was sent to projects in January 2012. Field data collection began in November 2012 and ended in early April 2013. Because PHAs/projects have varying practices, ICF designed data collection instruments and guidelines for data collection that were flexible enough to obtain data from the variety of circumstances found in PHAs/projects. The major tasks accomplished during data collection and the instruments used to accomplish these tasks are discussed below.

Creating the Data Collection Instruments. More than 35 data collection instruments were used for this study to collect data at both the project and tenant levels. These instruments were similar to those used for the previous data collection efforts, though instruments were modified to improve the data collection process. Project-level instruments were used to gather information to facilitate data collection, collect data elements necessary to calculate QC rent, and gather information about certification and recertification practices. The tenant-level data collection instruments were created to collect data and determine whether (1) there were errors in the eligibility determination, (2) the household rent was calculated correctly, and (3) units were correctly assigned according to the study standards. Each instrument was created by a survey research specialist and reviewed by a HUD policy expert. The Office of Management and Budget (OMB) approved all data collection instruments.

Automating the Data Collection Process. This study used an enhanced version of the data collection system used in previous studies. Project-level data were collected through Web surveys, the PSI and the PSQ, that were developed using the Select Survey Software. Data from household files were entered directly into laptop computers and a CAPI (computer assisted personal interviewing) system was used to interview tenants. This system, referred to as the HUDQC Data

[17] Verification is a process of obtaining information about income or expenses from a third-party who can attest to the accuracy of the information provided by the household. HUD requires that most information provided by the household be verified by a third-party or substantiated from documents (e.g., printouts from the Enterprise Income Verification (EIV) system).

Collection Software (HDCS) system, was developed by a special team of ICF survey specialists and computer systems experts.[18] As sections of the instruments were collected by field interviewers, the HDCS system compared the data with a range of acceptable responses and data previously entered, allowing data entry errors to be corrected in the field. The system required all data to be collected in the correct order and all appropriate skip patterns to be followed.

The automated system also alerted the field interviewer if key pieces of information used to calculate rent were missing and needed to be located and documented. This structured, automated process greatly reduced the need to edit, code, and clean the data after the close of data collection. HDCS data were transferred to study headquarters electronically on a daily basis. The incoming data were reviewed in an ongoing QC process. This continual data review during the collection process ensured data accuracy and permitted headquarters staff to resolve issues or request further clarifying documents while field interviewers were still in the field.

Contacting the PHA/Project. PHA/project contact names were obtained from HUD headquarters staff. E-mails were sent to PHA/project staff advising them of the study and requesting their participation. Prior to field interviewer training and data collection, each project in the study was sent a Web survey requesting background information essential to the data collection process as well as specific data for the calculation of QC rent. The rent calculation information requested varied by program but included questions relating to items such as passbook rate, utility allowance schedules, payment standards, minimum rent and flat rent. PHA/project staff verified the project type and size, and the location of project offices and files. Projects were also requested to indicate if the selected project had been designated a "special demonstration project" by HUD. If a project answered in the affirmative to this question and this status was confirmed, the project was replaced in the study. Public Housing projects were also requested to identify any income exclusions they adopted in addition to those specified by HUD. In addition, MTW projects (both PHA-administered Section 8 Voucher and Public Housing) were requested to send their Administrative Plan and Admissions and Continued Occupancy Policy (ACOP) documents. Administrative Plan and ACOPs for MTW projects were thoroughly reviewed to identify any non-standard rent calculation policies; any project specific policies were incorporated into the QC rent calculation methodology.

The data requested from the PHA/project were essential in the calculation of the QC rent and in preparing interviewers to begin the process of data collection. For these reasons, a 100 percent response rate to our request for information was necessary. Rigorous strategies were employed to ensure compliance and completeness of requested information prior to field data collection.

A second Web survey was sent to a PHA/project staff person who was identified in the initial survey as being knowledgeable about project certification and recertification procedures. This survey requested information about local policies and procedures that could explain any rent error findings. Questions included staff training practices, verification procedures, workload of staff who conduct certifications and recertifications, quality control practices, and optional questions for PHAs regarding their policies on interim reviews.

[18] The base of HDCS is the CSPRO software system, which is used by the U.S. Agency for International Development (USAID) to collect demographic and health information in many countries.

Hiring and Training Field Interviewers. Sixty-four field interviewers were hired to complete the field data collection and each interviewer was assigned a group of projects. Field interviewers typically lived in the same general area as the projects selected for the study. Thirty-nine field interviewers who had not worked on the previous year's study (for FY 2011), attended a 10-day training session; while 24 experienced interviewers who completed the FY 2011 study attended a 3-day training. The 10-day training covered:

1. Project background
2. HUD programs and requirements
3. Survey procedures
4. Automated data collection
5. Administrative procedures

The 3-day training sessions covered a review of the project background and data collection procedures and focused particularly on changes implemented for the FY 2012 study.

Abstracting from Household Files. At certification and recertification, PHAs/projects must complete either Form HUD-50058 (for each household in Public Housing and PHA-administered Section 8 programs), an MTW Form HUD-50058 (for each household in MTW projects), or a Form HUD-50059 (for all other programs in the study). Data from Forms HUD-50058/50059 were entered directly into the HUD Data Collection Software (HDCS) on each field interviewer's laptop computer. As the data were entered, the system identified potential data entry errors, such as incorrect codes or numbers, on the basis of internal calculations and consistency checks. If key data used in the rent calculation formula were missing from Forms HUD-50058/50059, the system alerted the interviewer to obtain the information from another document in the household file or project office. These electronic checking procedures enabled field interviewers to make immediate corrections and updates.

HDCS was designed to collect data in the same format as the official Form HUD-50058 and Form HUD-50059 published by HUD. The New York City (NYC) Public Housing Authority uses a format for the Form HUD-50058 that slightly differs from the standard. However, due to the large number of NYC Public Housing units and PHA-administered Section 8 Voucher cases in the study, copies of the corresponding PIC 50058 data for these cases were requested and used for data collection when available. In previous study years we encountered projects where Form HUD-50058 differed from the official HUD format. In those cases, ICF developed crosswalks by examining the data elements on the atypical form and developing a plan that illustrated which fields corresponded to the standard Form HUD-50058. In the FY 2012 study, 82 non-standard documents required crosswalks compared to 15 in FY 2011. These 82 documents were found in 17 projects administered by seven PHAs. The increase in the use of non-standard documents can be attributed to the inclusion of MTW projects. Twelve of the 17 projects with non-standard documents were from MTW projects.

In addition to the data collected from HUD Form-50058/50059, field interviewers collected data from the household files to document the determination of tenant eligibility and the calculation of rent. A series of documentation forms were created for this purpose. The documentation form data were entered directly into the HDCS system. The Documentation Form Module also collected

information indicating whether the income, asset, household composition, or expense information used by the PHA/owner was verified. HDCS compared data from Form HUD-50058/50059 with that entered into the Documentation Forms Module and alerted the field interviewer to possible data entry errors, allowing immediate review and correction of the data while the file documents were easily accessible.

During the data entry phase, documents from the file were photocopied when appropriate and sent to study headquarters weekly. Forms HUD-50058/50059, Enterprise Income Verification (EIV) reports, earned income documentation, tenant declaration and certification interview forms, worksheets indicating rent calculation, and utility allowance calculation worksheets from the file were always copied. Field interviewers were also required to photocopy file documents that provided information missing from Form HUD-50058/50059 that would be necessary to calculate QC rent (i.e., number of bedrooms), any earned income disregard documentation in the file. The photocopies were used to insure the accuracy of the QC rent.

Interviewing Tenants. For this study, an adult household member (preferably the head of the household) was interviewed in person using CAPI. Interview questions focused on family composition, sources and amounts of income, assets, and applicable expenses. Data were collected for the same point in time as when the recertification was conducted. HDCS compared data from Form HUD-50058/50059 with that entered during the interview to alert the interviewer to possible errors.

Requesting Verification from Third-Party Sources. When there was no evidence in the household file that the PHA/owner verified the information used for calculating rent, or the existing verification information did not meet requirements agreed to for this study,[19] ICF requested verification from the appropriate third-party sources. Verification was also requested from third parties when household interviews resulted in the identification of sources of income that were not found in the household files. Tenants signed release forms during the household interview so that third-party verification of income and expenses could be obtained. In addition, release form cover letters were also signed by all adult members of the household to ensure that third parties contacted for verification of information would be satisfied with the validity of the request. Third-party entities completed the forms and returned them to study headquarters where data were compared to other file information.

Matching Social Security Data. Sample household members were matched with Social Security Administration (SSA) files by HUD. The output from this match identified the Social Security and Supplemental Security Income (SSI) benefit as well as the Medicare premium data for all household members. These data were considered third-party verification during the final QC rent determination.

[19] For purposes of this study, verification was acceptable if it was in writing, received from the third party, and dated 120 days before or 59 days after the effective date of the certification. Acceptable verification could include documentation from a third party brought in by the tenant if the documents met specific date criteria.

D. Field Data Collection Time Periods

Data were collected in the field between November 2012 and April 2013 for the certification or annual recertification that occurred during FY 2012 (October 2011 through September 2012).[20] Field interviewers collected data related to actions that may have occurred up to 18 months prior to the file abstraction and household interview. In collecting data to document actions taken in the past, a major challenge was developing methodologies to ensure the collected data reflect the situation that existed at the selected point in time. For the respondent in the household interview, it may be difficult to recall details of life situations at a past point in time. Some respondents in this population may have unstable situations resulting from inconsistent income or changes to household size, further complicating data collected from the past. In light of these challenges, ICF developed strategies to ensure consistent and accurate collection of data across program types, projects, and households in the study. The below section describes two primary strategies developed for this purpose: the quality control month and third-party verification rules.

Quality Control Month. The month for which data were collected is referred to as the Quality Control Month (QCM). This month represents the date the rent calculation for the certification or annual recertification (conducted in FY 2012) was completed. For most households in the Owner-administered program, the QCM is the month in which the project manager (or other authorized housing project staff member) signed Form HUD-50059, certifying that the information contained on the form was correct. The rent calculation date on Form HUD-50058 was the "date modified" printed on the form. If these pieces of information were not available on Form HUD-50058/50059, the field interviewer used other documentation in the household file to determine when the action was taken.

After the QCM was established, the data from Form HUD-50058/50059 corresponding to the QCM was entered into HDCS. The data from the documents used by the project staff to verify information on Form HUD-50058/50059 in the QCM were also entered in a separate HDCS module. The household interview was conducted with frequent reminders to the respondent that questions being asked pertained to the QCM.

Note: If the recertification was overdue by more than 12 months, 12-month intervals were added to the QCM so that the QCM date fell within our FY 2012 review period. In this situation, during the household interview, the respondent was questioned about circumstances for the month in which the recertification would have been completed had the housing project staff completed it on time. In rare situations, when the rent was calculated after the effective date of the action (because of retroactive adjustments) the QCM is the earlier of two dates - the rent calculation or the effective date of the action.

Third-Party Verification Rules. Occasionally the verifications found in the file for household composition, income, asset, and expense items were different than those required by HUD. In addition, files were likely to contain verification documents other than those intended to support the recertification corresponding to the QCM. To ensure that the data from the right documents (i.e., those that were gathered to verify the information on Form HUD-50058/50059 under review)

[20] To account for delays between the time the work is completed by the PHA/project staff and the effective date of the recertification, actions effective in October 2012 were included in the FY 2012 study.

were entered into HDCS, and to apply rules fairly and consistently across all households in the study, ICF developed a set of rules defining acceptable verification. For the purpose of this study, verification was considered acceptable if it was in writing, from a third party, and dated within 120 days before or 59 days after the effective date of recertification. Third-party verification was considered acceptable whether it was received directly from the third party, brought in by tenants during the recertification process, or submitted during the household interview. This was a modification to the date rules of prior QC studies when a document was considered acceptable verification only if it was dated within 60 days before or 30 days after the date the recertification was completed. Field interviewers were given detailed instructions on the various types of documents they were likely to find in the file and how to classify them. The date and type of verification for each household, income, and expense item was entered into HDCS during file abstraction. The HDCS system informed the interviewer if any items did not meet the verification requirements of the study. For the items that did not meet the requirements, the field interviewer requested written verification from the appropriate third-party entity.

E. Constructing the Analysis Files

The initial data files consisted of four separate files that included: abstracted information from Form HUD-50058 and Form HUD-50059, household file information from the Documentation Form Module, information from the household interview, and third-party release form data. Data items were collected at both the member and household levels, with income and expense items in hourly, weekly, monthly, or annual amounts. ICF constructed an analysis file that annualized all income and expense data at the household level. For some items, such as stable income from Social Security, this calculation was relatively easy. For other items, such as sporadic employment or medical expenses, annualizing income or deductions was more complicated. A unique linking variable was created to compare information abstracted from file documentation with information obtained in the household interview and received from third-party verification. This variable specifically identified the income, asset, and expense, and the household member to which the item belonged.

For the calculation of rent error, the final analysis files contained income and expense/allowance data aggregated at the household level in annual amounts. Rent data were in monthly amounts. Separate files were created for the analysis of issues such as verification, internal Form HUD-50058/50059 errors, and occupancy standards.

F. Rent Formula

HUD uses a specific set of rules for determining tenant rents for each of its programs. The algorithm for determining the Total Tenant Payment (TTP) is the same for all programs except Sections 202 PRAC, 811 PRAC, and 202/162 PAC, and MTW. The TTP is the greater of the following:

9. Thirty percent of a household's adjusted monthly income defined as one-twelfth of the total of all household members' earned and unearned income—other than those amounts specifically excluded by HUD or PHA policy—less allowances for elderly/disabled households and household dependents, and deductions for disability, medical, and child care expenses

10. Ten percent of a household's gross monthly income with no allowances or expense deductions
11. The welfare rent in as-paid states (New York was the only as-paid state in this study)
12. The minimum rent ($25 for Owner-administered projects, or an amount established by the PHA, not to exceed $50)

The formula for determining the TTP for the Sections 202 PRAC, 811 PRAC, and 202/162 PAC programs includes Steps 1–3 above, but there is no minimum rent requirement for these programs.

MTW programs have the flexibility of modifying their TTP calculation process from the standard formula if the modification was established in their ACOP or Administrative Plan. In order to ensure that the MTW projects were not found in error if modification to rent calculation processes had been approved, ICF reviewed the ACOPs and Administrative Plans for all MTW projects. Based on the review, modifications to the standard TTP calculations were implemented for the specific projects. Some common modifications used by MTW projects were:

1. Using 28%, or some other set percentage, of a household's adjusted monthly income to calculate TTP, instead of 30%;
2. Not deducting dependent or elderly/disability allowances from total annual income;
3. Using rent schedules for households within certain income bands;
4. Not counting income from assets if total assets are less than $50,000 or allowing for self-certification of assets when assets total less than $50,000; and
5. Using a tiered schedule to determine the amount of childcare, medical, or disability expense deductions.

There are five different rent calculations used to calculate the actual amount of the household's rent depending on the program type. These five rent calculations include:

1. Public Housing (MTW and non-MTW);
2. Section 8 Project-Based (including Moderate Rehabilitation), Sections 202 PRAC, 811 PRAC, and Section 202/162 PAC;
3. Section 8 Vouchers (MTW and non-MTW);
4. Section 8 Enhanced Vouchers (there were 13 Enhanced Voucher households in the study);
5. Manufactured Home Space Rental for Section 8 Vouchers (there were no households in the study sample that met this criterion).

The household rent was calculated after data from all sources were collected. When calculating rent, a cap was placed on the maximum amount of rent the tenant was required to pay. For all Section 8 programs, this is the lower of the Gross Rent or the Payment Standard; in the Public Housing program, this is the Flat Rent. If the Flat Rent was not available, the Ceiling Rent was used to cap the rent. For Section 202/162 PAC, the rent is capped at the Contract Rent. The rent is not capped for the Section 202 PRAC or Section 811 PRAC programs.

Additional rent calculations were necessary for households with ineligible noncitizens. Determining the correct rent for these households is a multipart process that first determines whether the household is entitled to continued assistance or a temporary deferral of termination of assistance, and then prorating the rent if appropriate. Two proration formula were used—one for Public Housing and one for all Section 8 programs.

The algorithms for the rent calculation formula can be found in Appendix A.

G. Calculation of Rent Error

The monthly rent algorithms used by ICF to calculate the national estimates of error are as follows:

- **Actual Rent—**The AC Rent is the monthly rent indicated on Form HUD-50058/50059. If this item was missing on Form HUD-50058/50059, the AC Rent was taken from another official document in the file.[21]
- **Quality Control Rent—**The QC Rent is the monthly rent calculated by ICF using all of the verified household information.[22]

Rent error was calculated by subtracting the QC Rent from the AC Rent. A discrepancy of $5 or less between the monthly AC and QC Rent was not considered to be an error. The $5 increment was used to allow for minor calculation and rounding errors, and to focus the data analysis on major sources of error.

H. Quality Control Rent

ICF calculated QC Rents using the best available information. Every effort was made to use data that would have been available to the PHA/project when determining which data to use in the QC rent calculation. Each income and expense item was processed individually. For each item, ICF first used available verification from the project files. If acceptable verification was not available from the household file, verification was requested during the household interview. If verification was not available during the household interview, verification was requested from an appropriate third party (see Section II-D for a discussion of acceptable verification). If the verification was not returned by a third-party entity, then data from certain documents in the household file were used even if they did not meet the verification criteria. The only documents used when acceptable verification was not available were: verification documents from third-party entities whose date fell outside the acceptable date range (when documents were present with other verification documents in the file for a particular transaction) and tenant self-certification documentation collected during the household's recertification process. The following special procedures were followed when calculating the QC Rent as appropriate:

[21] Rent Roll data were not used as a substitute for AC Rent because a previous study found that the Rent Roll sometimes included amounts to make up for previous unpaid rent, fines, or damages.

[22] Attempts were made to verify items that were not verified by PHA/owner staff; however, verification was not always obtained. If verification was not available, other information from the household file or documentation obtained during the household interview meeting study requirements was used to calculate the QC rent. Additionally, codes were assigned to indicate which rents were based on verified information and those for which the income/expense information was only partially or not verified.

- Income that started after the QCM was not counted when calculating the QC Rent.
- Income that ended after the QCM was counted for the full year unless it was clear that the PHA/owner knew that this income was going to end.
- Earned income bonuses were not counted unless it was clear that the bonus was paid on a regular basis.
- Temporary Assistance for Needy Families (TANF) and other welfare income were treated as the same source of income so that income listed as TANF on one form (e.g., the household questionnaire), and "Other Welfare" on another form (e.g., the documentation forms) would not be counted twice.
- Welfare income (TANF and other welfare), child support income, and child care expenses were treated at the household level instead of the household member level so that the same source of income assigned to various household members would not be counted twice. For example, if one household member (e.g., the head of household) is assigned a source of income on one document and the same income is assigned to another household member on another form (e.g., a child) the income would not be counted twice since it was assigned at the household level.
- Disability status was assigned to a household member based on EIV documentation if two items were evident on the EIV printout: (1) receipt of Social Security or SSI benefits and (2) a disability status of "yes."
- Passbook rates (for determining the imputed income from assets) for PHA-administered programs were taken from the project-level data collection information provided by PHA/owner staff. The passbook rate for Owner-administered programs is 2 percent.
- For new certifications, the low-income and very-low-income limits were obtained from HUD's Web site.
- When determining the prorated rent for Public Housing households with ineligible noncitizens, if the maximum rent was not present on Form HUD-50058, the Fair Market Rent (FMR) was used instead of the 95th percentile of Gross Rent, because the 95th percentile of Gross Rent was not available.
- The values from Form HUD-50058 were used for minimum rent, gross rent, payment standard, and flat rent unless the value was missing, in which case the missing value was taken from the PHA/project-level data collection information provided by PHA staff.
- The values from Form HUD-50059 were used for gross rent and contract rent unless the value was missing, in which case the missing value was taken from the project-level data collection information provided by owner staff.
- Welfare rent for the State of New York was taken from the project-level data collection information provided by PHA staff.
- A separate verification code was used to identify verification obtained from the EIV system. When Social Security, SSI, or Black Lung benefits were verified by EIV, the information was considered third-party in-writing verification. If EIV information was in the file for earned income or unemployment benefits, the dates associated with the form

were examined to determine whether the PHA/project staff had access to the EIV information at the time of the recertification. Copies of EIV reports (as well as other types of verification of earned income found in the household file) were sent to QC study headquarters and reviewed by data quality specialists to prevent mistakes in calculating the QC earned income value. Note: EIV was not considered an acceptable verification source for the calculation of earned income.

- When working with Social Security and SSI benefit information obtained through the Social Security Administration (SSA) data match, sometimes discrepancies were found between that data and EIV printouts found in the household file. If the two sources of information were contradictory, the information found on the EIV printout (from the household file) was used in the QC calculation.

I. HUD Requirements Complicating the Analysis

Several HUD requirements affected the data collection methodology and subsequent analysis. As noted in Section II-A, relevant HUD requirements were incorporated in the study standards used to determine error. All data collection procedures and analyses were developed on the basis of these study standards. Though most standards were easily implemented, several were more problematic and complicated the data collection process and/or the analysis of data, as discussed below.

Anticipated Income. The amount of rent a household will pay is determined on the basis of anticipated household income and deductions for the 12 months following recertification. For households with a stable income source like Social Security or steady employment, annual income estimates for the next 12 months are relatively accurate. However, many assisted households have members with sporadic employment or members who move in and out of the household. Also, certain expenses (e.g., medical expenses for elderly/disabled households, child care costs) are difficult to anticipate. Determining whether such income and expense amounts were figured correctly at the time of recertification is very difficult when data are collected after the changes occurred. Every effort was made to treat questionable income or expenses in the manner they were treated by PHA/project staff. Several of the special procedures described in Section II-H were created for this purpose.

Third-Party Verification. HUD regulations require that the information supplied by residents at recertification be verified by third parties (e.g., employers, the Social Security Administration, banks, medical personnel). Field interviewers obtained release forms from the households when evidence of verification was not present in the tenant's file, which were then used to request verification from the appropriate third parties. However, some third parties did not respond, returned information for incorrect time periods, required payment for the information requested, or presented other challenges that prevented obtaining the correct verification. Follow-up requests for missing verification were not made in all cases due to time constraints.

ICF and HUD established a set of verification rules to determine whether an item was verified. Chapter II, Section D identifies the rules used to determine whether verification was acceptable for each matched item used in the rent calculation. Tables 1a to 1h (in Appendix D) and Exhibit IV-19 in Chapter IV, Section D present the verification rates for different rent components.

Earned Income Disregard. The regulations governing the Public Housing and the PHA-administered Section 8 Voucher programs require PHAs to exclude a portion of earned income for households meeting certain criteria. Only participants in these programs—not applicants entering the programs—are eligible for this income exclusion.

To identify households eligible for the earned income disregard, tenants were asked about training and self-sufficiency programs during the household interview. Forty-three household members were identified as possibly entitled to an earned income disregard.

For these household members, we examined information on Form HUD-50058 and other household file documentation. We compared the QC-calculated earned income exclusion (using the household questionnaire information) with the earned income used by the PHA when calculating the total annual income.

Of the 43 cases identified as possibly entitled to an earned income disregard, neither the PHA nor the QC calculation gave an earned income disregard in 18 cases. In 15 cases, our QC calculation confirmed the PHA's earned income disregard determination. In two cases the PHA provided an earned income disregard but our QC review did not confirm this determination. In the remaining eight cases, our QC review determined that an earned income disregard was appropriate but the PHA did not provide the household with the income exclusion.

Training Programs. The regulations governing all housing programs included in this study require PHA/owners to exclude all amounts received under training programs funded by HUD, as well as the incremental earnings and benefits resulting to any family member from participation in qualifying state or local employment training programs.

To identify households eligible for the training program exclusions, the field interviewers documented training program information found in the household file and provided during the tenant interview. This information yielded 13 household members with indications of involvement in training programs. Three of these 13 households were found to be eligible for the training program income exclusion.

Permissible Deductions. Public Housing programs may adopt deductions from annual income in addition to HUD's required deductions. To ensure that the appropriate additional permissible deductions were taken into consideration when determining the adjusted annual income, we looked at two sources of information. First, we looked at items 8b through 8e on Form HUD-50058, which records the type and amount of permissible deductions. Second, our PSI questionnaire requested projects to identify additional exclusions adopted in their Public Housing program. We found that many PHAs use the Permissible Deduction section (items 8b through 8e) of Form HUD-50058 to record all kinds of information that have nothing to do with permissible deductions. Therefore, we had to rely on the PSI survey to determine whether the items listed on Form HUD-50058 were in fact additional permissible deductions. On the basis of the information obtained through the PSI survey and Form HUD-50058, 11 projects representing four PHAs identified permissible deductions. Five projects deducted a specific portion of earned income (for example, one project allowed the deduction of FICA tax amount from earned income); six permitted the deduction of medical expenses over three percent of gross income for any household.

Moving to Work Exceptions. As mentioned in Section F in this chapter, MTW programs have the flexibility of modifying their TTP calculation process from the standard formula if the modification was established in their ACOP or Administrative Plan. To ensure that all the modifications were incorporated into the QC rent calculation, policies regarding the various exceptions were extrapolated from each project's respective ACOP or Administrative Plan and policies were then included in the QC rent calculation.

Flat Rent. Households that elected to pay a flat rent rather than an income-based rent were included in the study. For these households there is no rent error. The QC rent is the same as the Flat Rent used by the PHA. In FY 2012, there were 63 flat rent cases in the study sample. It should be noted that determining if a household is paying the flat rent is not always easy due to contradicting data within Form HUD-50058. For most cases, items 2a (i.e., Flat Rent Annual Update) and 10u (i.e., Type of Rent Selected) could be used to identify whether the household is paying the flat rent instead of income-based rent. However, if these two items contradicted one another, notations from other documents in the file were taken into consideration.

Ineligible Noncitizens. HUD regulations require that rent be prorated for households with ineligible noncitizens unless the household meets certain criteria that allow the continuation of full assistance. ICF reviewed all households with ineligible noncitizens to ensure that the rent was calculated correctly. Households with ineligible noncitizens were entitled to the continuation of full assistance. Seven households (less than 1 percent of the households in the study) included an ineligible noncitizen.

Reduced or Terminated TANF Benefits. The regulations governing Public Housing and PHA-administered Section 8 programs included in the study require using the amount of the TANF benefit before reduction or termination when such changes to TANF benefits resulted from fraud or failure to cooperate with the welfare family self-sufficiency program. To identify households with reduced or terminated TANF benefits, tenants were asked during the household interview about previous receipt of TANF and whether their TANF benefits were reduced.

If the TANF benefits were reduced or terminated due to fraud or failure to comply with the welfare family self-sufficiency requirements, the value of the TANF benefit before the reduction or termination was used in the QC Rent calculation.[23] The TANF benefits in 54 households were reviewed and our QC review identified three cases where TANF amounts should have been imputed but where the PHA did not properly impute them in the household's income calculation.

Students. The regulations governing the PHA-administered Section 8 and Owner-administered programs included in the study require that students aged 18–24 meet certain criteria. If these criteria are not met, the parent's income must be included when determining if the student meets the program's financial requirements. For households with students, field interviewers documented student enrollment and member characteristics found in the household file or provided during the tenant interview. These households were reviewed to determine whether the student met the special student criteria as defined by HUD regulations. Twenty-nine cases were reviewed and all cases were determined as correctly receiving housing assistance.

[23] The value of this reduced or terminated TANF is offset by the amount of additional income the family received starting after the time the sanction was imposed.

III. STUDY OBJECTIVES AND ANALYTIC METHODS

This section presents the 17 study objectives and a brief description of the methodology used to fulfill these objectives.[24] At the end of this section Exhibit III-2 summarizes these objectives and provides information on where each objective is addressed within this report.

Objective 1: Identify the various types of rent errors and rent error rates, and calculate their variance estimates.

The identification of error types and error rates in the FY 2000 through FY 2011 studies is replicated in the FY 2012 analysis. These errors include the percent of households paying correct and incorrect rent, dollar error amounts, and dollar error rates. Variance estimates (standard errors) are provided for selected error rates. Errors are determined by recalculating the tenant rent on the basis of verified QC information and subtracting this amount from the tenant rent indicated on the Form HUD-50058/50059 (AC Rent). The following three types of dollar rent error estimates were calculated:

- **Dollar Rent Error—**The Dollar Rent Error is the difference between the monthly AC Rent and the monthly QC Rent (i.e., AC Rent minus QC Rent). A household rent was found to be in error if the difference between the AC Rent and QC Rent was greater than $5, while "proper" rent payments reflect differences of $5 or less. Rates of exactly matching AC and QC rents (within $1) are also presented. Simple percentages of the number of households paying the proper and exact rents are reported, as well as the percentage of households in error per program, the average gross dollars in error, and the percentage of rent dollars in error. For households that were ineligible when initially certified, the QC Rent is the flat rent for Public Housing households, or the Housing Assistance Payment (HAP) for Section 8 programs. The dollar error in these cases is also the QC Rent amount minus the AC Rent.
- **Total Component Dollars in Error—**The Total Component Dollars in Error is the absolute sum (i.e., the sum of the positive and negative amounts, ignoring the plus or minus signs) of all individual income and expense component errors. These errors are combined to provide an overall Total Dollars in Error and are presented as annual amounts.[25] A dollar amount of rent overpayment and underpayment was calculated for each component with identified error; however, some of these errors were overlapping or offsetting. For example, earned income may have been underreported while—perhaps because of a calculation error—SSI may have been overstated. The net difference could be zero, or a positive or negative amount.
- **Largest Component Dollar Error—**The Largest Component Dollar Error is the annual dollar amount of error for the income or expense components with the largest error. Income and expense components include the five sources of income (i.e., earned income, pension,

[24] For a more detailed description of the methodology, see *Analysis Plan for the FY 2012 HUDQC Study, Quality Control for Rental Assistance Subsidy Determinations,* an unpublished ICF report to HUD dated July 27, 2012.

[25] Because dollar component errors (CE) are reported on an annual basis while dollar rent errors (RE) are reported on a monthly basis, and rents are generally set at 30 percent of adjusted income, component errors are usually 40 times the corresponding rent error (.30 * CE = 12 * RE, or CE = (12/.30) * RE = (120/3) x RE = 40 * RE).

public assistance, other income, and assets) and the five types of deductions (i.e., medical, childcare, and disability assistance expenses; dependent allowance and elderly/disabled allowance). If the component with the largest error is earned income, the largest dollar error would reflect the difference between the earned income used by the PHA/project and the earned income used in the QC rent calculation.

The dollar error rate is used for other error calculations, including the national Rent Error Rate and Net and Gross Error Rates. The latter error calculations link errors in the rent determination process to dollar error rates, sparking new oversight practices to better manage HUD subsidies.

Objective 2: Identify the dollar costs of the various types of administrative errors.

Five types of administrative errors are linked to rent errors. Data obtained directly from the Form HUD-50058/50059 as well as project and tenant information from the tenant file are used to identify and measure each of the following error types:

- Calculation errors
- Consistency errors
- Transcription errors
- Incorrect determination of allowances and income sources
- Overdue certifications

Calculation errors are detected by recalculating section subtotals and the final rent based on the exact information on Forms HUD-50058/50059. The tenant rent is calculated using the detailed information on Forms HUD-50058/50059 and compared to the actual tenant rent on Forms HUD-50058/50059. If the two rents differ, there is a calculation error.

Consistency errors are detected when there is a lack of logical conformity between elements within Forms HUD-50058/50059. For example, the Effective Date of Action must be on or after the Date of Admission. Elderly status information must be consistent with information about the age of the head of household or spouse.

Transcription errors are detected by comparing Forms HUD-50058/50059 data with information in the tenant file. If Forms HUD-50058/50059 data for a specific income or expense item does not match the tenant file data, a transcription error exists.

Incorrect determination of allowances and income sources are identified by taking tenant file information and comparing it to the Forms HUD-50058/50059 data. Allowance errors are detected by calculating the allowances based on the tenant file information and comparing this QC allowance amount to the actual allowance on Forms HUD-50058/50059. Similarly, income is calculated based on the types and amounts of income reported in the tenant file. The improper application of allowances and incorrect calculation of income are a subset of transcription errors.

Overdue recertifications often produce rent errors because rents are based on out-of-date information. For households with overdue recertifications, the QC information is based on the month the recertification should have been completed rather than when it was completed.

Objective 3: Estimate the national-level costs for total error and major error types.

This analysis includes determining the national Rent Error Rate, the numbers and proportions of households found to be in error, the dollar amount of rent error, and the proportion of total dollars found to be in error. Sample data are weighted to provide national estimates.

Objective 4: Determine the relationship between errors detectable using the Form HUD-50058 and Form HUD-50059 and total errors found in the study.

As discussed under Objective 2, calculation and consistency errors identify mistakes made by the housing project staff. Under Objective 4, households with calculation and consistency errors are compared to households with QC errors to determine whether error found within Form HUD-50058/50059 can be used to predict QC error.

Objective 5: Determine whether error rates and error costs have statistically significant differences from program to program.

This analysis presents differences in error rates by program type. Data are provided for three administrative programs: Public Housing, PHA-administered Section 8 (Section 8 Vouchers and Moderate Rehabilitation programs), and Owner-administered (Section 8, Section 202 PRAC, Section 811 PRAC, and Section 202/162 PAC). The Gross and Net Error Rates are provided for each of these program types. The Gross Error Rate is the sum dollar amount of gross error divided by the sum dollar amount of QC Rent, and the Net Error Rate is the sum dollar amount of net error divided again by the sum dollar amount of QC Rent. Multivariate analyses were performed to determine whether differences from program to program were statistically significant.

Objective 6: Determine the apparent cause of significant rent errors, either on a sample or a comprehensive basis, to provide HUD with information on whether the error was caused primarily by the tenant or by program sponsor staff.

As in the previous studies, ICF provides descriptive information on the sources of discrepancies between housing file information and verified information, and describes the incidence of administrative errors and their impacts. We also examine whether failure to verify sources of income and expenses contribute to QC error. Multivariate analyses using administrative errors and income components as independent variables are performed to identify how these errors affect the QC Dollar Rent Error.

Objective 7: Determine the extent to which households are over-housed relative to HUD's occupancy standards.

This objective addresses whether households reside in units with the correct number of bedrooms. Generally accepted HUD guidelines specifying the appropriate size unit for assisted households are shown in Exhibit III-1.[26]

[26] Housing projects have discretion in determining unit size and may determine unit size differently than shown.

For most programs, the rules are not based solely on household size and allow discretion on the part of the project staff. All programs allow exceptions to these rules. This study replicates the analyses in the previous studies that identified bedroom size and program, and the proportion of households in compliance with and in violation of occupancy standards according to the guidelines in Exhibit III-1.

Exhibit III-1
PHA-Administered Section 8 Unit Size Standards

Number of Bedrooms	Number of Persons in Household	
	Minimum	Maximum
0	1	1
1	1	2
2	2	4
3	3	6
4	5	8
5	5	10

Objective 8: Provide information on the extent to which errors are concentrated in projects and programs.

ICF conducts further descriptive analyses to examine whether errors are concentrated within or randomly distributed across PHAs/projects. Multivariate analyses are conducted with the tenant as the unit of analysis. Tenant and PHA/project characteristics are analyzed as independent variables predicting error rates. This analysis identified how each of these variables contributes to rent error. The results will help guide HUD's management of error rates and elaborate relationships between management practices and project/tenant characteristics that affect error rates.

Objective 9: Identify the percentage of newly certified tenants who were incorrectly determined eligible for program admission.

Incorrect initial eligibility determinations create long-term problems for assisted-housing programs. Newly certified households are reviewed to determine whether they met the eligibility requirements for assisted housing.

Five eligibility requirements reviewed at initial certification are not a part of the recertification process (and thus not confirmed on an ongoing basis): definition of family, citizenship, verification of Social Security numbers, signing consent forms, and low- and very-low income limits. This study did not investigate the definition of family because it is determined by the PHA or owner. Therefore, findings are provided on four of the five initial certification criteria. This study also did not include suitability factors that PHA/owners may use in selecting tenants such as tenant histories, histories of drug use or criminal activity.

Objective 10: Determine the extent to which Section 8 Voucher rent comparability determinations are found in the tenant file and indicate the method used to support the determination. Determine whether voucher payment standards are within 90 to 110 percent of FMR, and determine whether the correct utility allowances are being used in Section 8 Voucher households.

To comply with the rent reasonableness requirement, housing authorities must determine that Section 8 Voucher rents are reasonable in comparison with rents for similar housing in the private, unassisted market. Using information collected from tenant files, we estimated the proportion of Section 8 Voucher recipients with comparable documentation. For those with documentation, we classified the type of evidence cited in the tenant file documentation (e.g., no evidence, cited market estimates for comparable units, or the rents of one or more units considered to be comparable). We present weighted proportions of voucher recipients with rent comparability data.

Additionally, payment standard data from Form HUD-50058 are compared with FMR data to identify the households whose payment standards fall outside the 90 to 110 percent FMR band. Utility allowance schedules are likewise matched to tenant files to evaluate the issues associated with independently evaluating utility allowances as a potential component of rent error.

Objective 11: Estimate the total positive and negative errors in terms of HUD subsidies.

Proper payments are those in which the AC Rent equals the QC Rent. Errors can be either tenant overpayments (i.e., AC Rent is greater than QC Rent) or tenant underpayments (i.e., AC Rent is less than QC Rent). Overpayment error rates were calculated by dividing the total amount of overpayment by the total QC Rent; underpayment error rates were calculated similarly by dividing the total amount of underpayments by the total QC Rent.

Objective 12: Determine the extent to which error rates in projects that use an automated rent calculation system differ from errors in those that do not.

We investigate the relationship between using an automated rent calculation system and project-level gross error rate using an analysis of variance. We also examine whether Gross Rent Error differed significantly by computer use between programs. This analysis is addressed in Appendix G.

Objective 13: Determine whether other tenant or project characteristics on which data are available are correlated with higher or lower error rates.

To respond to this objective, we used multivariate analysis to conduct more detailed analyses of differences among PHAs/projects and provide HUD with more information for identifying projects and tenants likely to exhibit high error rates. This analysis is addressed in Appendix G.

Objective 14: Determine whether cases for which Form HUD-50058/50059 data had been submitted to HUD were more or less likely to have errors than those for which data had not been submitted.

The QC sample was matched to the PIC/TRACS data. Analysis was conducted to compare the average dollars in error for households included in PIC/TRACS with those that are not included.

Objective 15: Determine the extent of errors that were due to unreporting of income by tenants.

All adult household members in the QC study were matched with the National Directory of New Hires (NDNH) database to identify sources of earnings and unemployment compensation benefits received, but not reported, by tenants. Following the guidelines provided in the *HUD Income Matching Procedures for Analyzing Income Match Data,* unreported sources of income were identified along with the subsidy overpayment dollars associated with those unreported sources of income. The findings from this analysis was presented to HUD in the *FY 2012 Income Match Report* dated September 6, 2013.

Objective 16: Determine the extent of program administrator rent and income determination errors.

This objective is essentially a summary of Objectives 1 through 3. The percentage of households in error and the dollars associated with those households will be determined analytically and reported accordingly.

Objective 17: Determine the extent of errors due to Multifamily Housing Program administrators billing for subsidy that did not correspond to the subsidy reported on the HUD-50059/HUD-50059A for a tenant household.

In FY 2012, the Multifamily Housing Program Billing Study option was not implemented.

Exhibit III-2
Summary of Study Objectives

#	Objective	Where Objective Is Addressed	
		Executive Summary	Section IV
1	Identify the various types of rent errors and rent error rates, and calculate their variance estimates. These include: • Dollar Rent Error, • Total Component Dollars in Error, • Largest Component Dollar Error.	p. v, ix Exhibits 2 & 5	p. 5–7; Exhibits 3–5 p. 14–15; Exhibits 13–14
2	Identify the dollar costs of the various types of errors, including: • Calculation errors, • Consistency errors, • Transcription errors, • Incorrect determination of allowances and income sources, • Overdue recertifications.	p. vii–ix	p. 23–24; Exhibits 22–23 p. 13–14; Exhibits 12–13 p. 10-11; Exhibit 9
3	Estimate the national-level costs for total error and major error types.	p. v; Exhibit 3	p. 5–8; Exhibits 3–6
4	Determine the relationship between errors detectable using the Form HUD-50058 and Form HUD-50059 and total errors found in the study.	p. xi	p. 19; Exhibit 18

Exhibit III-2
Summary of Study Objectives (continued)

#	Objective	Where Objective Is Addressed	
		Executive Summary	Section IV
5	Determine whether error rates and error costs have statistically significant differences from program to program.	p. v	p. 7; Exhibit 5
6	Determine the apparent cause of significant rent errors, either on a sample or a comprehensive basis, to provide HUD with information on whether the error was caused primarily by the tenant or by program sponsor staff.	p. vii–ix	p. 13–23; Exhibits 12–23
7	Determine the extent to which households are over-housed relative to HUD's occupancy standards.	p. x	p. 25-26; Exhibits 24a
8	Provide information on the extent to which errors are concentrated in projects and programs.	p. v	p. 5–8; Exhibits 3–6
9	Identify the percentage of newly certified tenants who were incorrectly determined eligible for program admission.	p. x	p. 10; Exhibit 8a
10	For Section 8 Voucher households, determine • the extent to which rent comparability determinations are found in the tenant file, and indicate the method used to support the determination; • whether payment standards are within 90–110% of fair market rents; • whether the correct utility allowances are being used.	p. x–xi	p. 27–37; Exhibits 25–29
11	Estimate the total positive and negative errors in terms of HUD subsidies.	p. v; Exhibit 3	p. 11–12; Exhibits 10a–11
12	Determine the extent to which error rates in projects that use an automated rent calculation system differ from errors in those that do not.	p. xi	p. 42–43
13	Determine whether other tenant or project characteristics on which data are available are correlated with higher or lower error rates.	p. x–xi	p. 42–43
14	Determine whether cases for which Form HUD-50058/50059 data were submitted to HUD were more or less likely to have errors than those for which data were not submitted.	p. xi	p. 37–40; Exhibits 30a–e
15	Determine the extent of errors that were due to non-reporting of income by tenants.	These findings were published in a separate Income Match Report.	
16	Determine the extent of program administrator rent and income determination errors.	p. iv–v, ix; Exhibits 1–3, 5	p. 5–8; Exhibits 3–6 p. 10–11; Exhibit 9 p. 13–15; Exhibits 12–14 p. 23–24; Exhibits 22–23
17	Determine the extent of errors due to Multifamily Housing Program administrators billing for subsidy that did not correspond to the subsidy reported on the HUD-50059/HUD-50059A Form for a tenant household.	In FY 2012, the Multifamily Housing Program Billing Study option was not implemented.	

IV. FINDINGS

A. Overview

Analyses were conducted using weighted sample data for 2,404 households.[27] Data are presented by the three program types that were the basis for the sampling design—Public and Indian Housing (PIH)-administered Public Housing, PHA-administered Section 8 Housing Choice Voucher, and Moderate Rehabilitation programs (PHA-administered Section 8); and Office of Housing-administered Section 8, Section 202 PRAC, Section 811 PRAC, and Section 202/162 PAC programs (Owner-administered). Each of the major study findings, the reasons for the errors, and other background information concerning these errors are discussed below. In many of the exhibits throughout the report, the data collected during the current study (referred to as the FY 2012 data) are compared with the data collected in a previous study (referred to as the FY 2011 data). The data were collected and the analysis was completed for the FY 2011 study in calendar year 2012.

This discussion is divided into 11 parts: (1) the errors in the rent amount based on the QC data (rent error); (2) the errors in sources of income and expenses (component errors); (3) the errors found using only project file data (administrative error); (4) occupancy standards; (5) findings related to rent reasonableness determinations; (6) utility allowance analysis; (7) payment standard analysis; (8) comparisons with PIC/TRACS data; (9) analysis of the responses received from PHA/project staff regarding PHA/project practices (based on the Project Staff Questionnaire); (10) multivariate analysis; and (11) errors for the 20 Largest PHAs. The multivariate analysis will be included in an addendum at a later date. The first three parts discussed above present different types of error.

Rent error is error that results in an actual dollar error. A dollar error means the household paid too much rent (an overpayment) or the household paid less rent than it should have paid (an underpayment).

Component errors are the income and expense components used to calculate rent. The income components are employment income, Social Security and pensions, public assistance, other income, and asset income. The expense/allowance components are elderly/disabled allowance, dependent allowance, medical expenses, child care expenses, and disability expenses.

Administrative errors are errors that result from administrative mistakes. They consist of the following:

- Consistency errors—errors in logical conformity between elements within Form HUD-50058/50059
- Calculation errors—arithmetic errors within subsections of Form HUD-50058/50059
- Transcription errors—errors in transferring information from documentation in the tenant file to Form HUD-50058/50059
- Overdue recertification—Failure to conduct a recertification in a timely manner

[27] Appendix B presents the procedure used in weighting the data.

- Verification error—Failure to verify information

Component and administrative errors may or may not result in rent errors. Administrative errors tell us at what point during the rent determination process an error occurred, while the component errors tell us which income or expense caused the error. Data supporting the discussion are presented in the source tables found in Appendix D.

B. Rent Error

Overview. Rent errors were identified by subtracting the QC Rent from the Actual Rent.[28] The QC Rent was calculated using third-party verification whenever possible. If third-party verification was not available, information from the documentation forms was used. The AC Rent is the Tenant Rent from Form HUD-50058/50059. As noted above, a household was considered to be correct (proper payment) if the QC Rent and the AC Rent matched within $5. All exhibits included in this report (except Exhibit IV-2) and all tables in Appendix D define households in which the AC Rents and QC Rents matched within $5, indicating a proper payment. This does not hold for the supplemental tables in Appendix D (designated by the letter "S"), which are based on exact matches between these two rents.

Definitions of Rent Errors. Dollar error can be determined by comparing the rent the household should have paid with what it was paying, or by identifying the percentage of the Federal subsidy that was paid in error. In this study, error was determined by the first method. The rent errors presented throughout this report were calculated in the following manner:

- *Dollar Rent Error* was calculated at the household level by subtracting the household's QC Rent from the Actual Rent. Note that these are monthly rents. A negative number indicates an underpayment, meaning the household paid less than it should have paid and that HUD's contribution was higher than it should have been. A positive number indicates a household overpayment, meaning the household paid more than it should have paid and HUD's contribution was less than it should have been.
- *Gross Rent Error* is the absolute value (i.e., the sum of the absolute value of positive and negative Rent Error) of the Dollar Rent Error for the sample as a whole or a specified group of households. The Gross Rent Error functions simply as a measure of the magnitude of the errors. The dollar amounts presented in the tables are Gross Rent Error values, unless otherwise indicated.
- *Net Rent Error* is the arithmetic value (i.e., the sum of the negative and positive values of over- and underpayments) of the rent error.
- *Error Rate* is calculated by dividing the sum of the Rent Error (gross or net) by the sum of the QC Rent for the entire sample or a specified group of households.

Financial Impact of Identifying Rent Error. Reduction in the rent error associated with the programs included in this study does not mean there will be an overall savings in the costs

[28] Rent error is determined on the basis of Tenant Rent, not TTP. Error based on TTP may differ from Tenant Rent because of the program-specific rent formulas applied when calculating Tenant Rent. These rent formulas are listed in Section II-F and presented in detail in Appendix A.

associated with administering these programs. Given there are large numbers of eligible households on waiting lists, if a household leaves the program because it is no longer eligible for a subsidy then another household will take its place. The replacement household may be entitled to a smaller or a larger subsidy than the household that left the program. Therefore, the most direct benefit of identifying households with rent error is to ensure those households that are eligible for the program are receiving the correct subsidy, rather than to reduce the amount of funds needed to administer the programs. The most appropriate use of this study is as a tool for strengthening HUD's procedures for ensuring administrative compliance with regulations. The recommendations presented in this report may require greater rather than fewer resources to provide HUD, PHAs, and owners with the written policy guidelines and training, standardized forms, and ongoing monitoring needed to assure the programs are administered correctly.

The first two columns present the percentage of rent components that were verified with third-party in writing, third-party verbal, documentation[29] or Enterprise Income Verification (EIV). Beginning in FY 2011, this column also represents Upfront Income Verification (UIV), which was counted as part of third-party in writing in previous studies. For FY 2011, UIV was broken out into a separate category to help distinguish between UIV and other third-party in writing verification. Verification of all rent component categories increased in FY 2012 from the previous year. Verification of child care expenses increased the most from 90 percent to 97 percent, an increase of 7 percent. Verification of other income and medical expenses both increased 6 percent, and verification of earned income increased 5 percent. As of FY 2011, the category of third-party in writing only includes written third-party verification forms, which are sent directly to the third-party and completed by the third-party by hand. As the exhibit indicates, when compared to the previous study period, the use of third-party in writing verification declined for all rent components except medical expenses and child care expenses. This decline seems to be the result of the new HUD guidelines, as sending out for and obtaining third-party in writing verification is required in fewer instances, and more documentation is considered acceptable. The increased use of documentation for verification confirms these findings. Verification using third-party in writing decreased substantially in FY 2012 compared to FY 2011. Rent components verified that use of third-party in writing verification continued to decline in FY 2012 with the largest decrease, 17 percent, occurring in public assistance verifications. The use of documentation increased for four rent components and stayed the same in two rent components. It should be noted that since the sample size for disability expenses is so small, the findings are not reliable national estimates and are not included in Exhibit IV-1.

Tables C-1c, C-1d, C-1e, C-1f, and C-1g in Appendix D provide additional verification information by rent component. They present the number of households for which the income or expense component was not verified (i.e., no component items verified), partially verified (i.e., some component items verified), or fully verified (i.e., all component items verified) by different types of verification. Table C-1c includes items verified by a third-party in writing or EIV/HIV. Table C-1d provides data for items verified by verbal third-party information. Table C-1e provides data for items verified via tenant file documentation, Table C-1f includes items verified by EIV, and Table C-1g includes items verified by UIV.

[29] Documentation refers to documents submitted by the family such as pay stubs or bank statements, or a statement in the file indicating the project staff viewed an acceptable verification (but there was no copy in the file).

Proper Payments. Exhibit IV-1 shows the percentage of households with proper payments by program, for households where the Actual and QC Rents matched within $5 and where the Actual and QC Rents matched exactly. At recertification, the rent was calculated correctly (within $5) in 72 percent of the households, lower than the 75 percent of households calculated correctly in FY 2011 but higher than the 67 percent of households calculated correctly in FY 2010. There was an exact match of rent payment in 57 percent of households in FY 2012, compared with 62 percent in FY 2011, and 55 percent in FY 2010.

Exhibit IV-1
Percent of Households with Proper Payments

Administration Type	Percent of Households Within $5			Standard Error	Percent of Households Matched Exactly			Standard Error
	2010	2011	2012	2012	2010	2011	2012	2012
Public Housing	71%	79%	75%	2.2%	60%	65%	60%	2.4%
PHA-Administered Section 8	62%	68%	70%	2.1%	50%	57%	53%	2.1%
Total PHA-Administered	*65%*	*72%*	*71%*	*1.6%*	*54%*	*59%*	*55%*	*1.4%*
Owner-Administered	71%	81%	75%	2.0%	58%	67%	61%	2.8%
Total	**67%**	**75%**	**72%**	**1.3%**	**55%**	**62%**	**57%**	**1.4%**

Source: Table 2 and 2S, Appendix D

Households with QC Rent Error. Exhibit IV-2 shows the percentage of households in error, the average dollar amount in error, and error rate by program. Twenty eight percent of the households had a rent error greater than $5, higher than the 25 percent recorded in FY 2011. The average gross dollars in error, calculated by dividing the sum of the dollar amount of gross error (i.e., the sum of the absolute values of under- and overpayments) by the total number of households was $14 in FY 2012, higher than the $13 average gross dollar error in FY 2011. The total gross dollar error rate, calculated by dividing the sum of the dollar amount of Gross Rent Error by the sum of the dollar amount of the QC Rent remained at six percent in FY 2012.

Exhibit IV-2
Percent of Households with Error, Average Dollars in Error, and Dollar Error Rate for All Households with Error

Administration Type	Percent of Households with Error		Average Gross Dollars in Error		Gross Dollar Error Rate	
	2011	2012	2011	2012	2011	2012
Public Housing	21%	25%	$11	$14	5%	6%
PHA-Administered Section 8	32%	31%	$19	$16	8%	7%
Total PHA-Administered	*28%*	*29%*	*$16*	*$15*	*7%*	*7%*
Owner-Administered	19%	26%	$7	$11	4%	5%
Total	**25%**	**28%**	**$13**	**$14**	**6%**	**6%**

Source: Table 2 and 5, Appendix D

Underpayment and Overpayment Households. Exhibits IV-3a and IV-3b show the percentage of households and average dollar amount of error for all households when errors of $5 or less are excluded from calculations; these Exhibits present the error for underpayment and overpayment

households, respectively. Sixteen percent of all households paid in excess of $5 less than they should have in FY 2012, higher than 12 percent in FY 2011. For FY 2012 households, the average monthly underpayment error is $60, less than the mean of $73 in FY 2011 and higher than the mean of $47 in FY 2010.

Exhibit IV-3a
Underpayment Households:
Percent of Households and Average Monthly Dollar Amount of Error

Administration Type	Percent of Households in Error			Average Dollar Amount of Error					
				For Underpayment Households (with errors > $5)			For All Households		
	2010	2011	2012	2010	2011	2012	2010	2011	2012
Public Housing	15%	11%	13%	$45	$75	$68	$7	$8	$9
PHA-Administered Section 8	17%	15%	17%	$49	$81	$62	$8	$13	$10
Total PHA-Administered	*16%*	*14%*	*15%*	*$48*	*$80*	*$64*	*$8*	*$11*	*$10*
Owner-Administered	14%	9%	16%	$45	$50	$49	$6	$5	$8
Total	**16%**	**12%**	**16%**	**$47**	**$73**	**$60**	**$7**	**$9**	**$9**

Source: Table 2 and 4, Appendix D

As shown in Exhibit IV-3b, 12 percent of all households paid in excess of $5 more than they should have in FY 2012, which is less than the FY 2011 percentage of 13 percent and the FY 2010 percentage of 18 percent. The average monthly overpayment for households with overpayment error is $39 in FY 2012, up from $34 in FY 2011 and $33 in FY 2010.

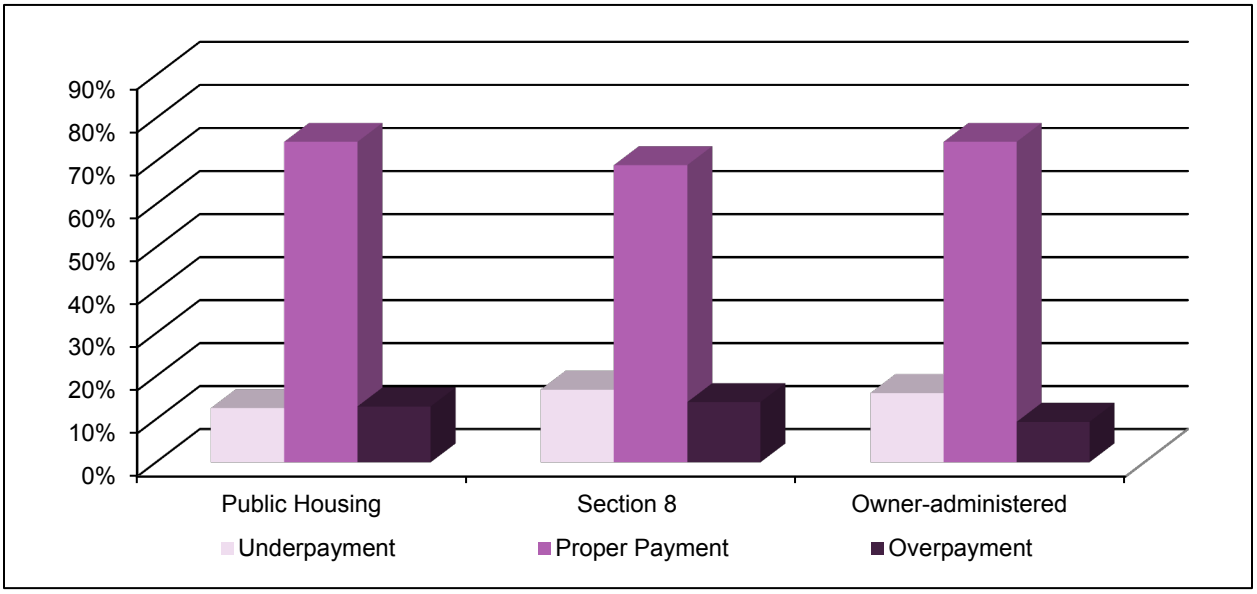
Exhibit IV-3b
Overpayment Households
Percent of Households and Average Monthly Dollar Amount of Error

Administration Type	Percent of Households in Error			Average Dollar Amount of Error					
				For Overpayment Households (with errors > $5)			For All Households		
	2010	2011	2012	2010	2011	2012	2010	2011	2012
Public Housing	14%	10%	13%	$38	$27	$41	$5	$3	$5
PHA-Administered Section 8	21%	16%	14%	$33	$39	$43	$7	$6	$6
Total PHA-Administered	*19%*	*14%*	*14%*	*$34*	*$36*	*$42*	*$6*	*$5*	*$6*
Owner-Administered	15%	10%	9%	$29	$27	$30	$4	$3	$3
Total	**18%**	**13%**	**12%**	**$33**	**$34**	**$39**	**$6**	**$4**	**$5**

Source: Table 2 and 4, Appendix D

Figure IV-1 shows the percentage of underpayments, proper payments, and overpayments by program type. Programs were grouped into three categories—Public Housing, PHA-administered Section 8, and Owner-administered. Note that the majority of cases fall in the proper payment category for all program types. As indicated above, a household was considered to be correct (proper payment) if the AC Rent and the QC Rent matched within $5.

Figure IV-1
Payment by Program Type



Gross and Net Dollars in Error. Exhibit IV-4 presents the gross and net average dollars in error and their associated standard error. To obtain the Gross and Net Rent Error, the dollar amount of overpayments is added to the dollar amount of underpayments, first using the absolute values for gross error, and then the arithmetic values for the net error. The net error measures the dollar cost of the errors and is -$5 (indicating a tenant underpayment) for FY 2012; the average gross dollar error is $15 for FY 2012 and represents the dollars associated with the errors (the magnitude of the errors). Gross average dollar error increased in FY 2012 for Public Housing and Owner-administered programs while PHA-administered Section 8 gross average dollar error decreased in FY 2012 compared to the previous year. While gross average dollar error has decreased for PHA-administered Section 8 and increased for Public Housing, total average dollars in error for all PHA-administered programs remained the same as FY 2011 at $16. In addition, there was no statistically significant change in average dollar error overall.

Exhibit IV-4
Gross and Net Dollar Rent Error (Monthly) for All Households

	Gross Rent Error				Net Rent Error			
	Average Dollars in Error		Standard Error		Average Dollars in Error		Standard Error	
Administration Type	2011	2012	2011	2012	2011	2012	2011	2012
Public Housing	$11	$14	$1.51	$2.11	-$6	-$4	$1.80	$1.36
PHA-Administered Section 8	$19	$17	$2.07	$1.95	-$6	-$5	$2.10	$2.14
Total PHA-Administered	*$16*	*$16*	*$1.40*	*$1.65*	*-$6*	*-$5*	*$1.72*	*$1.59*
Owner-Administered	$7	$11	$1.26	$1.78	-$2	-$5	$1.54	$1.77
Total	**$13**	**$15**	**$1.00**	**$1.25**	**-$5**	**-$5**	**$1.34**	**$1.22**

Source: Table 5, Appendix D
Note: Difference from FY 2011 at significance p<0.05

Error Rates by Program. Differences in error rates by program type were investigated and the results are summarized in Exhibit IV-5. Differences include the Gross Error Rate (i.e., the sum dollar amount of gross error divided by the sum dollar amount of QC Rent) and the Net Error Rate (i.e., the sum dollar amount of net error divided again by the sum dollar amount of QC Rent). The Gross Error Rate of 7.3 percent remains higher for PHA-administered Section 8 programs than for either Public Housing or Owner-administered programs. PHA-administered Section 8 programs showed a modest decrease in their gross error rate in FY 2012 compared to FY 2011, decreasing about 0.9 percent. The Gross Error Rate for FY 2012 increased slightly from FY 2011 for both Public Housing, and Owner-administered programs. Over all programs, the Gross Error Rate increased very slightly, about 0.2 percent, from FY 2011 to FY 2012. The Net Error Rates for all programs decreased from negative 2.1 percent in FY 2011 to negative 1.9 in FY 2012.

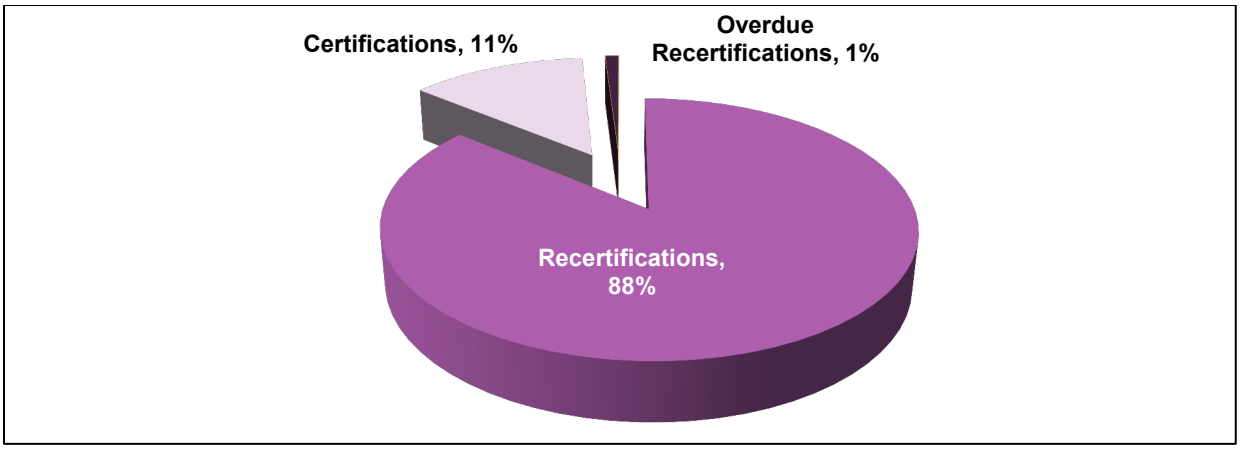
Exhibit IV-5
Gross and Net Dollar Error Rates (Monthly) for All Households

Administration Type	Error Rates			
	Gross Error Rate		Net Error Rate	
	2011	2012	2011	2012
Public Housing	4.7%	5.8%	-2.4%	-1.4%
PHA-Administered Section 8	8.4%	7.3%	-2.7%	-1.9%
Total PHA-Administered	*7.1%*	*6.7%*	*-2.6%*	*-1.7%*
Owner-Administered	3.5%	4.8%	-1.0%	-2.3%
Total	**6.0%**	**6.2%**	**-2.1%**	**-1.9%**

Source: Table 5, Appendix D

Certifications/Recertifications. The sample households included both certifications (i.e., newly admitted households) and recertifications. Certifications were analyzed to determine whether these households were eligible for HUD housing assistance and recertifications were analyzed to determine whether they were overdue. Figure IV-2 presents the breakdown of cases by case type—certifications, recertifications, and overdue recertifications.

Figure IV-2
Case Type



Source: Table 6, Appendix D

Exhibit IV-6 shows the breakdown of the percentage of certifications, recertifications not overdue, and recertifications overdue, by program type. The exhibit indicates that in FY 2012, 88 percent of the households were timely recertifications, and less than 1 percent of the households were overdue recertifications, both very close to FY 2011 percentages. The findings indicate that there was a slight decrease in the total percentage of certifications—from 13 percent in FY 2011 to 11 percent in FY 2012.

Exhibit IV-6
Certifications and Recertifications by Administration Type

Administration Type	Certifications		Timely Recertifications		Overdue Recertifications		Row Total By Year*
	2011	2012	2011	2012	2011	2012	
Public Housing	14%	14%	85%	85%	2%	1%	100%
PHA-Administered Section 8	11%	8%	87%	91%	2%	1%	100%
Total PHA-Administered	*12%*	*10%*	*86%*	*89%*	*2%*	*1%*	*100%*
Owner-Administered	15%	15%	85%	85%	<1%	<1%	100%
Total	**13%**	**11%**	**86%**	**88%**	**1%**	**<1%**	**100%**

Source: Table 6, Appendix D
* Rounding may result in totals not equal to 100%.

Certifications. Exhibit IV-7a presents a summary of the findings related to eligibility criteria and Exhibit IV-7b shows the percentage of newly certified households meeting the certification criteria by program type.

The reviewed criteria included citizenship, Social Security number, signing the appropriate consent form, and qualifying as low-income or very low-income households. However, only those households that do not meet the appropriate low- or very low-income limit are ineligible for assistance. All households (according to the QC Rent calculation) fell within the low-income limit for total gross income.

A household met the citizenship or Social Security number criteria if there was evidence in the tenant file that the citizenship or Social Security number had been verified. The data indicate that a citizenship code (indicating whether each household member was a citizen, eligible noncitizen, or ineligible noncitizen) and a Social Security number was available (from either the tenant file or the household interview) for each household member. According to the citizenship codes, no households in FY 2012 had a household member for whom there was no verification of citizenship. This is unchanged since FY 2010. To meet the citizenship verification requirement, the file must have contained (for each household member) a signed declaration of U.S. citizenship or eligible immigration status; proof of age documentation; an INS card; or INS system verification of citizenship status, or documentation that the member was in process for verification or an INS hearing.

One percent of the households had at least one member for whom there was no verification of their Social Security number. To meet the Social Security number verification requirements the file must have contained (for each household member) a copy of the Social Security card or statement from the Social Security Administration verifying the Social Security number.

In 95 percent of the households, there was a signed consent form, dated within 15 months of the QCM (the date for which data were collected), for all members age 18 or over. Note that not meeting the Social Security number, citizenship, and consent form criteria may not mean the household was not eligible for assistance; rather, it means that the project did not follow the HUD requirements in documenting the information.

Exhibit IV-7a
Percent of Newly Certified Households Meeting Certification Criteria

Certification Criteria	Met Criterion	
	2011	2012
Citizenship	100%	100%
Social Security Number	99%	99%
Consent Form	90%	95%
Low and Very Low Income	100%	100%
Meets All Eligibility Criteria	89%	95%

Source: Table 7, Appendix D

Exhibit IV-7b
Percent of Newly Certified Households Meeting Certification Criteria by Program Type

Certification Criteria	Percent of Households Meeting the Criteria		
	Public Housing	PHA-Administered Section 8	Owner-Administered
Citizenship	100%	100%	100%
Social Security Number	100%	99%	98%
Consent Form	94%	95%	97%
Low and Very Low Income	100%	100%	100%
Meets All Eligibility Criteria	94%	95%	96%

Source: Table 7b, Appendix D

Underpayments and Overpayments for Certifications, Recertifications, and Overdue Recertifications. Exhibit IV-8 presents a summary of the households with overpayments and underpayments by the type of case—certification, timely recertification, and overdue recertification. The average dollar amounts are based on the sum of the dollar amounts for payment errors (either underpayment or overpayment) for the type of household (i.e., certification, overdue recertification, or timely recertification) divided by the number of households with that payment type (for whom a QC Rent could be calculated). For example, the sum of monthly underpayment dollar amounts for new certifications ($4.2 million) was divided by the total number of certifications for whom QC Rent could be calculated (.54 million). The result is an underpayment average dollar amount of $8.

The data indicate that the amount of underpayment and overpayment average dollar error in new certifications and timely recertifications in FY 2012 range from $5 to $9 each month. As might be expected, there is a large difference in the underpayment error for overdue recertifications ($38), as well as the overpayment dollar error for overdue recertifications ($31). The estimates for overdue recertifications can vary widely from year to year due to the small number of cases.

Exhibit IV-8
Average Monthly Underpayment and Overpayment:
Dollar Amount Averaged Across All Households

Household Type	Underpayment Average Dollar Amount		Overpayment Average Dollar Amount	
	2011	2012	2011	2012
Certifications	$11	$8	$3	$5
Timely Recertifications	$8	$9	$4	$5
Overdue Recertifications	$39	$38	$52	$31
Total	**$9**	**$9**	**$4**	**$5**

Source: Table 8, Appendix D

Subsidies. The actual cost of errors to HUD is expressed in terms of subsidy payments. For the purpose of this study, HUD subsidies for the PHA-administered Section 8 Voucher program equal the lower of the Gross Rent or the applicable payment standard minus the Tenant Share. For Public Housing, the subsidy is the applicable payment standard minus the TTP, and for Owner-administered programs, the subsidy is the Gross Rent minus the TTP. The subsidy is correct if the AC Rent equals the QC Rent (within $5). A negative subsidy error occurs when the tenant pays too much rent (QC Rent < Actual Rent) and HUD pays too little. A positive subsidy error occurs when the tenant pays too little rent (QC Rent > Actual Rent) and HUD overpays. These subsidy errors by program type are summarized in Exhibit IV-9a and 9b. The subsidy errors by certification status are summarized in Exhibit IV-10.

Exhibit IV-9a
Positive Subsidy Households (Tenant Underpayment)
Percent of Households and Average Monthly Dollar Amount of Error

Administration Type	Percent of Households in Error		Average Dollar Amount of Error			
			For Positive Subsidy Households (with errors > $5)		For All Households	
	2011	2012	2011	2012	2011	2012
Public Housing	11%	13%	$75	$68	$8	$9
PHA-Administered Section 8	15%	17%	$81	$62	$13	$10
Total PHA-Administered	*14%*	*15%*	*$80*	*$64*	*$11*	*$10*
Owner-Administered	9%	16%	$50	$49	$5	$8
Total	**12%**	**16%**	**$73**	**$60**	**$9**	**$9**

Source: Tables 2 and 4. Appendix D
Note: Table results replicate Exhibit IV-3a for the convenience of the reader.

Exhibit IV-9b
Negative Subsidy Households (Tenant Overpayment)
Percent of Households and Average Monthly Dollar Amount of Error

Administration Type	Percent of Households in Error		Average Dollar Amount of Error			
			For Negative Subsidy Households (with errors > $5)		For All Households	
	2011	2012	2011	2012	2011	2012
Public Housing	10%	13%	$27	$41	$3	$5
PHA-Administered Section 8	16%	14%	$39	$43	$6	$6
Total PHA-Administered	*14%*	*14%*	*$36*	*$42*	*$5*	*$6*
Owner-Administered	10%	9%	$27	$30	$3	$3
Total	**13%**	**12%**	**$34**	**$39**	**$4**	**$5**

Source: Tables 2 and 4, Appendix D
Note: Table results replicate Exhibit IV-3b for the convenience of the reader.

Exhibit IV-10
Average Monthly Dollar Amounts of Error for Positive (Tenant Underpayment) and Negative (Tenant Overpayment) Subsidies Averaged Across All Households

Household Type	Positive Subsidy Average Dollar Amount of Error		Negative Subsidy Average Dollar Amount of Error	
	2011	2012	2011	2012
Certifications	$11	$8	$3	$5
Timely Recertifications	$8	$9	$4	$5
Overdue Recertifications	$39	$38	$52	$31
Total	**$9**	**$9**	**$4**	**$5**

Source: Table 8, Appendix D
Note: Table results replicate Exhibit IV-8 for the convenience of the reader.

C. Sources of Error

Additional analyses examined which income and expense components contributed the most to rent error. It should be noted that the component dollar amounts are annual income and expense dollars, rather than the monthly figures used to present rent error data, and that rents are generally computed at 30 percent of adjusted income. Therefore, every $100 of income or expense error generally translates into $2.50 of rent error. In addition, the sum of the component errors is greater than net rent errors because of off-setting errors. For example, the household presented in the chart below has earned income and child care costs with errors in both components. The total component error is $1,000 ($800 + $200); however, the adjusted net income error (the amount used to determine the household's rent) is only $600.

Example of the Impact of Component Errors

Component	File Data	QC Data	Dollar Error
Earned Income	$2,200	$3,000	$800
Child Care Expense	$400	$600	$200
Adjusted Income	$1,800	$2,400	$600

Exhibit IV-11 presents each income and expense component included in the rent calculation and the percent of the households in error[30] where a certain component contributed the most to the gross error. The exhibit indicates that the largest average dollar error continues to be in earned income, with an average error of $4,632, and 28 percent of households in error where earned income is the largest component error. The next largest average dollar error, $4,528 in rent component disability allowance, results from calculated error in only a small number of cases. Other income was the third largest component, with an average dollar error of $3,599 found in 11 percent of households in error. Pension income was a component of error in 26 percent of households, with an average associated dollar error of $2,036. Public assistance income had the third largest average dollar error, with $2,892 in errors found in 6 percent of all households in error.

Between FY 2011 and FY 2012, average dollar error amounts increased for four of the six rent components producing the highest percentage error. Pension income and dependent allowance average dollar error decreased from FY 2011. The rent component with the greatest average dollar increase in error was public assistance with an increase of $986 from FY 2011 to FY 2012.

Exhibit IV-11
Rent Components Responsible for the Largest Dollar Error for Households with Rent Error

Rent Component	Percent of Households in Error		Average Dollar Amount	
	2011	2012	2011	2012
Earned Income	32%	28%	$3,881	$4,632
Pensions	16%	25%	$2,923	$1,846
Public Assistance	8%	6%	$1,906	$2,706
Other Income	16%	11%	$3,118	$3,599
Asset Income	2%	2%	$613	$684
Dependent Allowance	3%	6%	$580	$519
Elderly Allowance	2%	3%	$400	$400
Child Care Allowance	3%	2%	$2,237	$2,626
Disability Allowance	3%	<1%	$0	$4,528
Medical Allowance	15%	15%	$832	$1,049
No Rent Component Error	3%	3%	$0	$0
Total	**100%***	**100%***	**$2,594**	**$2,555**

Source: Table 9, Appendix D
* Numbers may not add up to 100% due to rounding.

[30] The denominator in the percentage is the number of households with any component error, which was 28 percent of total households in FY 2012.

Note that for some households the rent error is not caused by any one of the 10 components listed. Rather, it is caused by other arithmetic errors or using the wrong rent calculation formula. For most rent components, the percent of households in error changed minimally, with the exception of pension income as the source of rent error. Households in error due to pension income increased from 16 percent in FY 2011 to 25 percent in FY 2012.

Total and Largest Component Dollar Error by Program Type. Exhibit IV-12 shows the dollar amounts associated with the total dollars in error (the sum of the absolute value of errors in all rent components) and the largest dollars in error (the largest error attributable to a specific source for each household), by program type. There were increases in the average total dollars in error for Public Housing and Owner-administered programs in FY 2012, with the highest gain evident in Public Housing, increasing by $842 from FY 2011 to FY 2012. Owner-administered programs gained $313 average total dollars in error. Average total dollars in error decreased only for PHA-administered Section 8 programs from FY 2011 to FY 2012, with a decrease of $406. There were also increases in average largest dollars in error in Public Housing and Owner-administered programs, with public housing programs showing an increase of $684 from FY 2011 to FY 2012.

Exhibit IV-12
Total and Largest Component Dollars in Error for Households with Rent Error

Administration Type	Average Total Dollars in Error		Average Largest Dollars in Error	
	2011	2012	2011	2012
Public Housing	$2,873	$3,715	$2,514	$3,198
PHA-Administered Section 8	$3,679	$3,273	$3,009	$2,621
Total PHA-Administered	*$3,464*	*$3,408*	*$2,876*	*$2,797*
Owner-Administered	$1,864	$2,177	$1,689	$1,891
Total	**$3,084**	**$3,079**	**$2,594**	**$2,555**

Source: Table 10, Appendix D

QC Rent Components by Payment Type and Administration Type. Exhibit IV-13 shows the percentage of the total number of households with (and without) component error by component type and payment type. For example, five percent of total households with underpayment rent error had errors in earned income, six percent of households with proper payment had errors in earned income and four percent of households with overpayment rent had errors in earned income. Exhibit IV-14 also relays this data by PHA- and Owner-administered households. The exhibit indicates that pension income (11% = 7% underpayment + 4% overpayment) and earned income (9%) are the rent components with the highest percentage of error leading to improper payment, followed by medical expense (8%).

Exhibit IV-13
Rent Component Error by Payment Type for All Households

Rent Component	Underpayment			Proper Payment			Overpayment		
	PHA	Owner	Total	PHA	Owner	Total	PHA	Owner	Total
Earned Income	5%	5%	5%	7%	2%	6%	5%	2%	4%
Pension	6%	10%	7%	13%	18%	14%	4%	4%	4%
Public Assistance	2%	<1%	1%	2%	2%	2%	<1%	<1%	<1%
Other Income	2%	2%	2%	5%	3%	4%	3%	<1%	2%
Asset Income	<1%	3%	1%	4%	4%	4%	1%	<1%	<1%
Dependent Allowance	2%	<1%	1%	<1%	<1%	<1%	2%	1%	2%
Elderly/Disabled Allowance	<1%	<1%	<1%	<1%	<1%	<1%	1%	1%	1%
Child Care Allowance	<1%		<1%	<1%	<1%	<1%	<1%	<1%	<1%
Disability Allowance							<1%		<1%
Medical Allowance	3%	8%	5%	6%	12%	7%	3%	4%	3%
No Rent Component Error	<1%	<1%	<1%	44%	45%	44%	<1%		<1%

Source: Table 11, Appendix D

Exhibit IV-13 also reflects component errors in proper payment households when the component dollar error results in a tenant payment error of $5 or less. Considering all component errors, not just errors that result in tenant payment error, pensions (25%), earned income (15%) and medical allowance (15%) components have the highest rates of error.

Allowances. Elderly/disabled and dependent allowances were examined to determine whether these allowances were applied correctly.[31] The findings are summarized in Exhibit IV-14. The exhibit shows the percentage of elderly/disabled and nonelderly/disabled households for which allowances were correctly or incorrectly applied. Elderly/disabled allowances were incorrectly used in 2 percent of all households in FY 2012. Three percent of the elderly/disabled households received an incorrect allowance, while less than 1 percent of non-elderly/disabled households received an allowance erroneously.

The exhibit also shows the percentage of households with and without dependents for which a dependent allowance was correctly or incorrectly applied. The dependent allowances were incorrect in 3 percent of all households. In less than 1 percent of the households, a dependent allowance was given to a household that did not have dependents. For the remainder of the households with dependents in error (7%), either a dependent allowance was not given when it should have been or the wrong allowance amount was given. In total, 5 percent of all households had an incorrect allowance in FY 2012.

[31] Households with an elderly or disabled head or spouse are entitled to one $400 allowance (i.e., deduction from gross annual income) in calculating rent. Households are entitled to a $480 allowance for each dependent (defined as children under 18, full-time students, and disabled members other than the head or spouse).

Exhibit IV-14
Elderly/Disabled Allowances and Dependent Allowances

Allowance	Elderly Allowance			Dependent Allowance		
	Non-Elderly/ Disabled Households	Elderly/ Disabled Households	All Households	Households Without Dependents	Households With Dependents	All Households
No Allowance	100%	-	43%	100%	-	56%
Incorrect Allowance	<1%	3%	2%	<1%	7%	3%
Correct Allowance	-	97%	55%	-	93%	41%
Total	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**

Source: Tables 12a and 12b, Appendix D

D. Errors Detected Using Information Obtained from Project Files

To respond to HUD's interest in understanding the cause of errors, tenant rent was recalculated using only income and expense items documented in the tenant file. The source of information used for this analysis included only items that were documented clearly in the tenant file in a location other than Form HUD-50058/50059. If an item was recorded on Form HUD-50058/50059 but not documented elsewhere in the tenant file, it was not included when the tenant rent was calculated for this analysis. Therefore, it is possible that some of the discrepancies identified between Form HUD-50058/50059 tenant rents and tenant rents calculated solely based on file data were not, in fact, due to incorrect determinations, but rather due to program sponsor failure to maintain information supporting income or expense items.

The outcome is that relying solely on information in tenant files may result in misstating the basis for the program sponsor income and rent determination and could lead to a determination that an error existed when the determination was actually correct. The fact remains that, even if a program sponsor made the correct income determination, failure to document the determination is and should be treated as a serious administrative problem. Also, in practice, it appears that these types of discrepancies are often suggestive of subsidy determination errors, even if they cannot be assumed to prove the existence of such errors.

The findings from this analysis were compared with the quality control findings where tenant rent was calculated based on *all* the information collected during the study (including household interview data and verification obtained by ICF through third-party sources). Exhibit IV-15 shows the percent of households in error and the average dollar error based on the tenant file, but without income and expense items identified during the household interview and verified by ICF through third-party sources.

The data indicate that the income and expense items documented in the tenant file identify about two-thirds of the cases (10 percent error from tenant file alone compared to 16 percent error from all sources) with tenant underpayments (subsidy overpayments) and over 89 percent of tenant overpayments (subsidy underpayments). The difference in overpayment/underpayment error drawn from file documents alone might lead to a conclusion that underpayment errors result from missing

documentation while overpayment error derive from miscalculation of file documentation. However, there has been no clear trend in past years' studies to support this conclusion.

The data regarding average dollar error indicate that using the tenant file information alone does not identify all the error in the rent calculation. Average dollar error resulting in subsidy underpayment (tenant overpayment) was much higher ($55) when based on tenant file data alone compared to subsidy underpayment average dollar error using all study sources ($39). The difference in the subsidy overpayment ($61) compared to subsidy underpayment ($55), based on file documents alone, indicates there is no clear difference in PHA's handling of factors that contribute to overpayment or underpayment.

Exhibit IV-15
Findings With and Without Information Obtained from Sources Other Than the Tenant File

Error Source	Percent of Households in Error		Average Dollar Error	
	Subsidy Overpayment	Subsidy Underpayment	Subsidy Overpayment	Subsidy Underpayment
Error Based on All Income and Expense Items Identified During the Study	16%	12%	$60	$39
Error Based on Tenant File Without Income and Expense Items Identified During the Household Interview and Verification Obtained by the Contractor Through Third-Party Sources	10%	11%	$61	$55

Source: Tables 2 and 4, and Tenant File Table 2 and 4, Appendix D

Analysis of the errors on Form HUD-50058/50059 examined whether the errors identified using Form HUD-50058/50059 as a sole source of information are representative of the total errors in the program. The analyses focused on calculation and consistency errors:

- *Calculation error* was identified from income, expenses, and allowances used to calculate the rent amount and recorded on Form HUD-50058/50059. This calculation did not take into account whether dollar amounts were verified or whether the recertification was conducted on time. This analysis identified errors due to arithmetic mistakes, the incorrect use of a formula, and items that were not completed but should have been. This analysis did not identify households in which items were recorded in the wrong place on Form HUD-50058/50059, although improper use of a field on Form HUD-50058/50059 can result in a calculation error. Table C-13 in Appendix D presents the number of households with a Form HUD-50058/50059 that contained calculation errors by the rent component contributing to the error. The items considered when determining calculation error are listed in Appendix D.
- *Consistency errors* were based on the logical conformity of elements in Form HUD-50058/50059. For example, the effective date of action must be on or after the date of admission, elderly status information should be consistent with household head and spouse ages, and number of dependents should not exceed the number of household members. Table C-14 in Appendix D shows the number of households with consistency errors on Form HUD-50058/50059, summarized by form subsections. Appendix E lists the data items by subsection that were included in this analysis.

Exhibit IV-16 shows the percentage of households with calculation and consistency errors by Form HUD-50058/50059 subsections. It is important to emphasize that Form HUD-50058 is formatted differently and has more line items of information than Form HUD-50059. Consequently, the number and types of calculation and consistency errors on the forms differ, and findings from the two forms are not directly comparable.[32] In addition, the Office of Housing implemented a new version of the 50059 Form in FY 2006 and again in FY 2009. The large number of calculation errors (particularly in the Allowances and Adjusted Income section on Form HUD-50058) may be a contributing factor to QC errors, though a calculation or consistency error does not necessarily lead to a rent error. The PHA/owner may make an error when completing one section of the form and still calculate the rent correctly.

Exhibit IV-16
Percentage of Households with Calculation and Consistency Errors

Form HUD-50058/50059 Item	Percentage of Households					
	Calculation Errors			Consistency Errors		
	50058 Form	50059 Form	Total	50058 Form	50059 Form	Total
General Information	n/a	n/a	n/a	2%	9%	4%
Household Composition	4%	<1%	3%	3%	11%	5%
Net Family Assets and Income	8%	3%	6%	3%	<1%	2%
Allowances and Adjusted Income	40%	<1%	28%	11%	<1%	8%
Family Rent and Subsidy Information	15%	<1%	11%	<1%	<1%	<1%

Source: Tables 13 and 14, Appendix D

Comparison of Form HUD-50058/50059 Errors to QC Error. A comparison was made between the rent calculation errors on Form HUD-50058/50059 and errors identified through the QC Rent calculation process as shown in Exhibit IV-17. The purpose of this comparison was to determine whether errors identified using only Form HUD-50058/50059 data could predict the rent errors found in a QC review. When using only Form HUD-50058/50059 data to calculate the Actual Rent, errors were found in 12 percent of the households in FY 2012, an increase from the FY 2011 figure of 7 percent. The QC error calculation found errors in 29 percent of the households in FY 2012, up from 25 percent in FY 2011. The results are quite different when comparing error found through individual sources compared to error found when information sources are combined. This emphasizes that data from Form HUD-50058/50059 alone cannot accurately identify rent error. Exhibit IV-17 summarizes these results for FY 2011 and FY 2012.

[32] In FY2012, the inclusion of the MTW population presented additional challenges in identifying calculation and consistency errors for the MTW Form HUD-50058. For more information, please see Appendix E.

Exhibit IV-17
Form HUD-50058/50059 Rent Calculation Error Compared with QC Rent Error

Rent Calculation	Percentage of Households Correct		Percentage of Households Incorrect	
	2011	2012	2011	2012
Using Information on Form HUD-50058/50059	93%	89%	7%	12%
According to the QC Rent Calculation	75%	71%	25%	29%
Both Form HUD-50058/50059 Calculation and QC Rent Calculation	70%	63%	2%	3%

Source: QC Table 2 and Tenant File Table 2, Appendix D

Verification errors were identified by whether an item was verified by the project and, if it was, whether the correct information was transferred to Form HUD-50058/50059. An error occurs when the verified amount obtained by the project is not recorded properly on Form HUD-50058/50059 (and, presumably, not used correctly in the rent calculation). When determining whether a verified income or expense item matched the amount used on Form HUD-50058/50059, we assumed a variance of $100 to accommodate potential rounding errors when annualizing data. In 2010, HUD issued the *Implementation of Refinement of Income and Rent Rule,* which mandated the use of EIV as a third-party source to verify tenant employment and income information during mandatory recertification of family composition and income. The use of EIV minimizes the need for traditional third-party verification forms. FY 2011, the first fiscal year impacted by this rule, displayed large verification rate decreases across the board when compared to FY 2010, as verification was required in fewer instances. In FY 2012 there was a slight reversal of this trend with modest increases in items verified for four of the seven rent components.

The table series C-15a through C-15n in Appendix D shows the number of households with and without verification by type of verification (i.e., third-party in writing, third-party verbal, EIV, and documentation). These tables provide this information for each of the rent components and also by program type.

Verification Used in Determining the QC Rent. A set of rules was established for third-party verification (see Section II-D). If an income or expense component was used for a rent calculation and was not verified by the PHA/owner, ICF staff sought third-party verification. However, ICF verification could not be obtained for all PHA/owner unverified items despite considerable effort and expense.[33] In FY 2011, HUD issued new guidelines regarding verification. As a result, ICF modified its standards to accept documentation from a third party submitted by the tenant if the documents met specific date criteria.[34] Exhibit IV-18 shows the percentage of each rent component that was verified by either the PHA/owner or ICF. Findings from FY 2012 are compared to findings from FY 2011.

[33] If third-party verification was not available, documentation from the tenant file was used to calculate the QC rent. If neither third-party verification nor file documentation was available, documentation collected during the household interview that met study specific date requirements was used to calculate the QC rent. Information collected during the household interview that did not meet study specific date requirements was not used.

[34] For more information, please refer to the Data Collection Standards for the FY 2012 HUDQC Study, ICF unpublished report to HUD dated August 3, 2012.

Exhibit IV-18
Percent of Households Fully Verified by Either the PHA/Owner or ICF

Rent Component	Third-Party Verbal or in Writing, Documentation, EIV, or UIV		Third-Party in Writing		Documentation	
	2011	2012	2011	2012	2011	2012
Earned Income	91%	96%	49%	43%	30%	39%
Pension	98%	99%	80%	74%	4%	4%
Public Assistance	96%	100%	41%	24%	26%	34%
Other Income	87%	93%	32%	27%	32%	32%
Asset Income	95%	98%	53%	49%	26%	27%
Child Care Expense	90%	97%	58%	59%	24%	35%
Medical Expense	93%	99%	32%	43%	22%	21%

Source: Tables 1a and 1b, Appendix D

Exhibit IV-19 summarizes the findings in Table C-15a. In FY 2012, the number of households where verification was not obtained by the PHA/owner decreased for five of the seven rent components. Public assistance and other income both showed a 3 percent increase in lack of verification. There was modest improvement in project verification of earned income and pension income, with both increasing by 5 percent since FY 2011. Pension income continued to be the most commonly verified rent component item verified in 97 percent of cases in FY 2012. Percentage of verifications found to match Form HUD-50058/50059 within $100 decreased for three of the seven rent components in FY 2012.

Exhibit IV-19
Verification of 50058/50059 Form Rent Components by PHA/Owners

Rent Component	No Project Verification		Item Verified by Project		Verification Matched Form HUD-50058/50059 within $100	
	2011	2012	2011	2012	2011	2012
Earned Income	14%	9%	86%	91%	60%	65%
Pension	8%	3%	92%	97%	85%	85%
Public Assistance	16%	19%	84%	81%	70%	68%
Other Income	26%	29%	74%	71%	62%	60%
Asset Income	9%	7%	91%	93%	82%	85%
Child Care Expense	15%	11%	85%	89%	74%	76%
Medical Expense	10%	6%	90%	94%	74%	73%

Source: Table 15a, Appendix D

Exhibit IV-20 shows verification results by program type, again showing the verification rate for each rent component and the proportion that matched within $100 of Form HUD-50058/50059 amounts. When comparing the FY 2012 results to the FY 2011 findings, the following changes are of note:

- In the *Public Housing* program, there were decreases in the verification rate for three of the seven rent components in FY 2012 when compared with FY 2011, with the largest loss occurring in child care expense verification (79% in FY 2011 compared to 68% in FY 2012), followed by modest declines in other income verification (73% in FY 2011 compared with 63% in FY 2012), and asset income (85% in FY 2011 compared with 82% in FY 2012. Verification rate increases were seen in earned income (from 82% in FY 2011 to 88% in FY 2012) and pension income (from 90% in FY 2011 to 95% in FY 2012). The degree to which the verifications matched Form HUD-50058 within $100 (indicating correct usage of verification data) decreased in four of the seven rent components from FY 2011 to FY 2012, with the largest decrease occurring in child care expense (from a 72% match to a 57% match).
- In the *PHA-administered Section 8* programs, five of the seven rent components showed modest increases in percentages of items verified, with the largest increase occurring in child care verification, which increased by 9 percent. There were slight declines in other income which dropped from 79 percent in FY 2011 to 74 percent in FY 2012 and public assistance verification from 86 percent verified in FY 2011 to 85 percent in FY 2012. The degree to which the verifications matched Form HUD-50058 within $100 (indicating correct usage of verification data) increased or stayed the same for four of the seven rent components from FY 2011to FY 2012, with the largest percent gain for verifications which matched Form HUD-50058 evident in asset income (from 74% matching in FY 2011 to 88% in FY 2012).
- In the *Owner-administered* programs, the verification rate increased for five of the seven rent components. Pension verification and other income both increased by 7 percent from FY 2011 to FY 2012, followed by modest increases in verification for child care expense, medical expense, and earned income verification. Public assistance and asset income showed slight decreases in verification with a drop of seven percent in public assistance verification and one percent in asset income verification. The degree to which the verification matched Form HUD-50059 within $100 (indicating correct usage of verification data) increased for three of the seven rent components within a range of 1 percent (pension) to 7 percent (child care expenses). Public assistance, earned income, and asset income showed modest decreases in verifications matching between FY 2011 to FY 2012, while medical expense remained the same.

Comparing across program types in FY 2012, pension income, medical expense, earned income and asset income are the most frequently verified rent components. The least verified rent components are other income and public assistance. Across program types, earned income and other income verified showed the lowest percentage match between Form HUD-50058/50059 and file documents for that rent component.

Exhibit IV-20
Verification of Form HUD-50058/50059 Rent Components by PHA/Owner Staff by Program*

Rent Component	Public Housing		PHA-Administered Section 8		Owner-Administered	
	Verified	Matched**	Verified	Matched**	Verified	Matched**
Earned Income	88% (82%)	57% (50%)	93% (87%)	68% (59%)	91% (90%)	69% (75%)
Pension	95% (90%)	80% (81%)	98% (93%)	86% (86%)	99% (92%)	86% (85%)
Public Assistance	80% (80%)	69% (63%)	85% (86%)	68% (72%)	75% (82%)	68% (76%)
Other Income	63% (73%)	51% (56%)	74% (79%)	62% (65%)	72% (65%)	64% (59%)
Asset Income	82% (85%)	63% (69%)	96% (90%)	88% (74%)	94% (95%)	88% (90%)
Child Care Expense	68% (79%)	57% (72%)	95% (86%)	77% (71%)	95% (93%)	95% (88%)
Medical Expense	89% (86%)	65% (61%)	93% (88%)	69% (72%)	96% (92%)	79% (79%)

Source: Table 15h, Appendix D
* Findings from FY 2011 are in parentheses.
** Matched within $100

Tenant File Verification Compared with QC Error. Errors identified through the QC process were investigated to determine whether they were associated with sources of income and expenses. Exhibit IV-21 presents the percentage of households with QC error for which verification was missing in the tenant file. Each error is presented by rent component. The data indicate that missing verification does have a major impact on error. This was observed for every rent component for both the PHA- and Owner-administered programs.

In general, between FY 2011 and FY 2012 data from both the PHA- and Owner-administered programs show there were both increases and decreases in households where error was related to missing verification. For PHA-administered cases, rent component pension income showed the largest decrease in households in error with missing verifications between FY 2011 to FY 2012 with a drop of 40 percent. Other income rent error for households in error with missing verification increased by about 16 percent between FY 2011 and FY 2012. In Owner-administered households, the percentage of households in error with missing verification decreased substantially for pension income (25%) and asset income (17%), and decreased modestly in other income (14%) and earned income (13%). The percentage of households in error for public assistance and medical expense increased by 9 percent and 8 percent, respectively. However, for some of these components the number of households in error is relatively small, thus the estimates may vary substantially from year to year and may not be reliable. Missing verification in both PHA-administered and Owner-administered programs continues to be strongly associated with households that have QC error.

Exhibit IV-21
QC Error Households with Missing Verification in the Tenant File

Rent Component	Form HUD-50058				Form HUD-50059			
	Households with QC Error		Households with QC Errors and Missing Verification		Households with QC Error		Households with QC Errors and Missing Verification	
	2011	2012	2011	2012	2011	2012	2011	2012
Earned Income	12%	11%	53%	49%	4%	7%	61%	48%
Pension	8%	10%	86%	46%	6%	14%	85%	60%
Public Assistance	3%	3%	60%	61%	1%	1%*	70%	79%
Other Income	6%	5%	56%	72%	3%	3%	83%	69%
Asset Income	2%	2%	71%	74%	2%	3%	77%	60%
Child Care Expense	1%	2%	79%	77%	<1%	<1%*	100%	100%
Disability Expense		<1%*		100%	<1%	<1%*	100%	
Medical Expense	5%	6%	74%	82%	7%	12%	75%	83%
No Component Error	74%	74%			83%	76%		

Source: Tables 16a and 16b, Appendix D
* Cell sizes for these estimates are small, thus these estimates may not be reliable.

Summary of Form HUD-50058/50059 Errors. Exhibit IV-22a and Exhibit IV-22b provide a summary of the errors identified from Form HUD-50058/50059. These include consistency errors, calculation errors, and overdue recertifications. Note that Exhibit IV-22a excludes MTW cases, as these cases do not have a Form HUD-50058/50059 recalculated rent error, while Exhibit IV-22b shows all cases with QC rent error. The exhibits show the percentage of households in error, the average dollar error, and the standard errors for both households with recalculated Form HUD-50058/50059 error (i.e., error determined using only Form HUD-50058/50059), and households with QC Rent error. This information is provided for households with error for each error type. Beginning with the FY 2005 study, transcription error for any household was added to the source table and the data that was described as an unduplicated count of Form HUD-50058/50059 error has been revised to an unduplicated count of any type of administrative error. Exhibit IV-22b shows that most individual types of Form HUD-50058/50059 errors are not closely associated with QC rent error. However, Forms HUD-50058/50059 with only transcription error are associated with QC rent error in 74 percent of households, and any type of administrative error (e.g., transcription, consistency, calculation, or overdue recertifications) are associated with QC Rent Error in 79 percent of the households. This increase is primarily due to a small number of households with income calculation error, resulting in estimates with variances that are rather large from year to year.

When compared to FY 2011, there are only minor differences in percent of households in error for both recalculated Forms HUD-50058/50059 and for households with QC rent error. However, there is a large decrease in average dollar error for recalculated Forms HUD-50058/50059 pertaining to income calculation error, $209 in FY 2011 compared to $86 in FY 2012. This decrease, however, is primarily due to a relatively small number of households in error, which can result in extremely variable and potentially unreliable estimates from year to year.

In addition, the average dollar error for households with any recalculated Form HUD-50058/50059 error is $24. In contrast, the average dollar error for households with QC Rent error is $48. The values support the assertion that an administrative error on Form HUD-50058 or Form HUD-50059 is not necessarily associated with a QC Rent error.

To understand the reason for the change in the average dollar error for households with recalculated Form HUD-50058/50059 error, it is important to review how this number is calculated. The number is the average dollar rent error for all cases with error in the category identified in the row header (based on recalculated Form HUD-50058/50059 rent error—not QC rent error). So, for example, although the average rent error dollars for households with income calculation error is $86, because many of these cases have a large rent error and the number of cases with income calculation error is small (3% of households in error), the average dollar error is large.

Exhibit IV-22a
Non-MTW Households with Recalculated Form HUD-50058/50059 Error

Error Type Based on Form HUD-50058/50059 Recalculation	Non-MTW Households with Recalculated Form HUD-50058/50059 Error			
	Percent of Households in Error	Standard Error of Percent	Average Dollar Error	Standard Error of Mean
Households with Transcription Error	40%	10.2%	$32	$7.75
Households with Consistency Error	14%	2.8%	$52	$16.51
Households with Allowance Calculation Error	1%	.6%	$1	$0.00
Households with Income Calculation Error	3%	1.3%	$86	$39.93
Households with Other Calculation Error	2%	1.1%	$1	$0.00
Overdue Recertifications	1%	.7%	$1	$0.00
Unduplicated Count, Any Type of Administrative Error	44%	6.0%	$33	$7.00
Total Households	**100%**		**$24**	**$7.71**

Note: Data presented above excludes MTW households; MTW cases do not have Form HUD-50058/50059 recalculated rent error.
Source: Tables 17a and Appendix D

Exhibit IV-22b
Form HUD-50058/50059 Administrative Error: Percent of Households, Average Dollars in Error

Error Type Based on Form HUD-50058/50059 Recalculation	Households with QC Rent Error			
	Percent of Households in Error	Standard Error of Percent	Average Dollar Error	Standard Error of Mean
Households with Transcription Error	74%	2.0%	$45	$3.52
Households with Consistency Error	21%	2.0%	$43	$9.46
Households with Allowance Calculation Error	3%	1.3%	$39	$23.94
Households with Income Calculation Error	2%	0.7%	$29	$14.36

Exhibit IV-22b
Form HUD-50058/50059 Administrative Error: Percent of Households, Average Dollars in Error (continued)

Error Type Based on Form HUD-50058/50059 Recalculation	Households with QC Rent Error			
	Percent of Households in Error	Standard Error of Percent	Average Dollar Error	Standard Error of Mean
Households with Other Calculation Error	4%	0.9%	$50	$25.35
Overdue Recertifications	2%	0.7%	$95	$40.48
Unduplicated Count, Any Type of Administrative Error	79%	1.8%	$44	$3.51
Total Households	100%		$48	$4.39

Source: Table17b, Appendix D

Summary of Administrative Errors. As outlined in the study objectives, calculation errors, consistency errors, transcription errors, failure to recertify on time, and failure to apply allowances appropriately produce administrative errors. Exhibit IV-23 shows the Gross and Net Rent Errors for households with each type of administrative error. Starting in FY 2005, two major changes were made to this exhibit. First, the category of consistency errors was added to illustrate inconsistencies found within Form HUD-50058/50059. Second, the findings are now based on QC error rather than recalculated Form HUD-50058/50059 error. The percent of households in error were generally comparable to FY 2011 for all error types, as were the average gross and net dollars in error for all error types except overdue recertifications, which had large differences in error amounts due to the small number of overdue cases.

Exhibit IV-23
Administrative Error: Percent of Households Average Dollars in Error for All Households

Error Type	Percent of Households in Error	Gross Rent Error		Net Rent Error	
		Average Dollars in Error	Standard Error of Mean	Average Dollars in Error	Standard Error of Mean
Transcription Errors	43%	$23	$1.72	-$6	$1.84
Consistency Errors	18%	$15	$3.02	-$5	$1.55
Calculation Errors—Allowances	2%	$17	$9.68	-$4	$6.08
Calculation Errors—Income	2%	$8	$4.19	$2	$3.45
Calculation Errors—Other	3%	$21	$10.52	$2	$5.04
Overdue Recertifications	<1%	$69	$30.17	-$8	$23.84
Any Administrative Errors	53%	$19	$1.46	-$5	$1.54
Total	**100%**	**$14**	**$1.25**	**-$4**	**$1.22**

Source: Table 18, Appendix D

E. Occupancy Standards

Exhibit IV-24a presents a summary of the analysis that determined whether households are assigned units with the correct number of bedrooms. It shows the percentage of households by actual number of bedrooms and correct number of bedrooms according to the guidelines used in the study. Note that the guidelines used in this study are generally acceptable HUD guidelines. All programs allow exceptions to HUD's rules. For example, the PHA-administered Section 8 Voucher program sometimes allows households to rent units with fewer or more bedrooms than specified by the guidelines.

Sixteen percent of all households occupied a unit with too many or too few bedrooms in FY 2012, according to the guidelines used for this study. This number is up slightly from FY 2011, when 14 percent of all households occupied a unit with an incorrect number of bedrooms. Seventeen percent of Public Housing households, 22 percent of PHA-administered Section 8 program households, and 7 percent of Owner-administered households were under- or over-housed in FY 2012.

Exhibit IV-24a
Percentage of Households in Units with the Correct Number of Bedrooms According to Study Guidelines

Number of Bedrooms	PHA-Administered				Owner-Administered		Total	
	Public Housing		Section 8					
	2011	2012	2011	2012	2011	2012	2011	2012
0	100%	94%	91%	100%	96%	98%	97%	97%
1	100%	100%	99%	99%	100%	100%	99%	100%
2	80%	74%	70%	72%	80%	81%	74%	74%
3	87%	80%	81%	75%	89%	88%	83%	78%
4	69%	52%	56%	52%	63%	39%	61%	51%
All Units	88%	83%	79%	78%	94%	93%	86%	84%

Source: Table 19, Appendix D
* Cell sizes are too small to provide reliable estimates.

Exhibits IV-24b and IV-24c show the percentage of households that met these guidelines for each bedroom size for FY 2011 and FY 2012, respectively. The shaded cells indicate the percentage of households that fall within study guidelines.

Exhibit IV-24b
Percentage of All Households in FY 2011 by Number of Bedrooms and Number of Household Members

Number of Bedrooms	FY 2011 Number of Household Members							
	1	2	3	4	5	6	7	8+
0	97%	2%	1%					
1	90%	9%	<1%					
2	24%	48%	20%	7%	1%	<1%		
3	4%	12%	32%	33%	12%	6%	<1%	<1%
4	2%	3%	12%	21%	31%	17%	12%	3%
5				9%	39%	4%	21%	27%

Source: Table 19a, Appendix D

Exhibit IV-24c
Percentage of All Households in FY 2012 by Number of Bedrooms and Number of Household Members

Number of Bedrooms	FY 2012 Number of Household Members							
	1	2	3	4	5	6	7	8+
0	97%	3%						
1	91%	8%	<1%			<1%		
2	25%	49%	18%	7%	<1%	<1%		
3	8%	13%	35%	28%	11%	3%	<1%	1%
4	3%	3%	13%	27%	23%	10%	12%	9%
5	8%	4%	22%	10%	10%	20%	8%	20%

Source: Table 19a, Appendix D

F. Rent Reasonableness

The PHA-administered Section 8 program assists low-income families in obtaining housing in the private market. A PHA responsible for administering the program must not approve a lease until the housing authority has determined that the initial rent paid to the owner is a reasonable rent. The PHA must also determine whether the rent to the owner is reasonable in comparison to rent for other comparable unassisted units.

Rent Reasonableness is an important factor in determining participant subsidies and is critical for effective, PHA-administered, Section 8 program operations. If PHAs approve rents that are too high, limited government funds are wasted and it may inadvertently raise private market rents. If PHAs approve rents that are low compared to the private market, landlords may only participate with their lowest cost, lowest quality units or not rent out their units at all. Furthermore, approval of lower rent amounts may inappropriately restrict where assisted tenants may live. HUD regulations require PHAs to conduct a rent reasonableness determination before units are leased, before rent increases are granted to owners, and when Fair Market Rents decrease by at least five

percent. Our analysis examines whether PHAs fulfilled the requirement for documenting rent reasonableness determinations but does not investigate whether rents were in fact reasonable.

Methodology. We surveyed PHAs administering the Section 8 Voucher program in our study. This year, 158 "projects"[35] in our study fall into this category. The projects were asked about their standard rent reasonableness processes and file documentation from the project's household sample were reviewed.

Field interviewers were instructed to review tenant files for 799 Voucher households to locate the documents supporting the rent reasonableness certification. For 85 new certifications,[36] field interviewers reviewed the file for the initial rent reasonableness certification and recorded the date it was conducted. For the 714 annual recertifications we reviewed, field interviewers were asked to ascertain when the current rent to the owner became effective and to locate the relevant supporting rent reasonableness documentation. If this documentation was not found, relative to the date the rent to the owner became effective, field interviewers were asked to search for any rent reasonableness certification in the file and enter the date of certification. The owner's rent certification on the Request for Tenancy Approval (RFTA) form was considered a certification of rent reasonableness.

Findings Pertaining to Rent Reasonableness Methods Used by PHAs. The most common method of determining rent reasonableness is the unit-to-unit comparison (see Exhibit IV-25). Sixty-one percent of the housing authorities that responded had reported using unit-to-unit comparison as the predominant method for their rent reasonableness determination. The unit-to-unit method is similar to the standard real estate appraisal technique of comparing a unit to similar private, unassisted units in the same general location. Rent amounts are sometimes modified for differences in unit characteristics, such as size, age, amenities, housing services, maintenance, and utilities.

Exhibit IV-25
PHAs by Predominant Rent Reasonableness Method

Method	2010		2011		2012	
	Number	Percent	Number	Percent	Number	Percent
Unit-to-Unit Comparison	104	69%	83	59%	96	61%
Unit-to-Market Comparison	19	13%	22	16%	20	13%
Point System	20	13%	23	16%	27	17%
Other or Rent Control	1	1%	4	3%	7	4%
No Single Predominant Method	7	5%	7	5%	6	4%
No Information	0	0%	1	1%	2	1%
Total	**151**	**100%***	**140**	**100%***	**158**	**100%***

Data in this exhibit are not weighted.
*Totals may not add up to 100% due to rounding.

[35] For purposes of this study, a project for the Section 8 Voucher Program is defined as a PHA/county combination. Therefore, if a PHA administers vouchers in more than one county, that PHA could be represented in this study by more than one "project."

[36] Beginning in FY 2007, portability move-ins were classified as annual recertifications. In FY 2006, they were categorized as new admissions.

The unit-to-market comparison approach estimates the average and/or range of "market" rents for units with similar characteristics in the private, unassisted market. Thirteen percent of housing authorities reported primarily using this method. Valuation adjustments are based on typical units in the private market. Seventeen percent of housing authorities indicated that their primary method of making rent reasonableness determinations was based on a point system. Using this system, units are assigned points based on their condition and attributes, and comparisons are made to unassisted units.

PHA/project staff members were asked to identify only the primary method used to determine whether rents to owners were comparable to the private market, rather than enter a percentage use of various methods. Results remain consistent with FY 2011, as evidenced in Exhibit IV-25 below. When asked to identify a single predominant method, most PHAs selected only one. Four percent of projects selected "no single method predominates" in FY 2012, compared to 5 percent that responded in FY 2011. PHAs were also asked whether they used a software program and/or an outside contractor to determine whether the rent to owner was reasonable. One hundred and one of the 158 voucher projects (64 percent) use a rent reasonableness software. *Go Section 8* remained the most commonly used software vendor, cited by 30 projects in FY 2012 and by 21 programs in FY 2011, followed by *Socialserve.com*, used by 7 projects in FY 2012, and 3 in FY 2011. More PHAs reported using in-house developed software, 10 in FY 2012 compared with 3 in FY 2011.

Findings Pertaining to Rent Reasonableness Documentation Found in Tenant Files for New Admissions and Annual Recertifications. In FY 2012, 81 percent of new admission files contained rent reasonableness documents, down from 94 percent in both FY 2011 and FY 2010 (see Exhibit IV-26a). Annual recertifications require rent reasonableness documents only when owners increase rental rates. We examined case files to determine when the current rent to owner first became effective and reviewed the file for the rent reasonableness documentation specific to that rent determination. If no rent reasonableness documentation was found within this specific timeframe, we reviewed any rent reasonableness documentation in the file. Exhibit IV-26a shows that in FY 2012, 76 percent of these case files had certified rent reasonableness documents compared to 78 percent in FY 2011 and 73 percent in FY 2010 (see Exhibit IV-26a).

Exhibit IV-26a
Rent Reasonableness Documentation for New Admissions and Annual Recertifications

Status	2010		2011		2012	
	New Admissions	Recertifications	New Admissions	Recertifications	New Admissions	Recertifications
Determination Documented	94%	73%	94%	78%	81%	76%
No Determination Documented	6%	27%	6%	22%	19%	24%
Total	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**

Data in this exhibit are weighted.

The absence of rent reasonableness documentation does not necessarily indicate a determination was not completed, only that it was not properly documented. Of new admission files that had documentation, 55 percent contained a statement signed by the PHA staff certifying that the rent is reasonable. For recertifications with rent reasonableness documentation, 48 percent contained a statement signed by the PHA staff certifying that the rent is reasonable (see Exhibit IV-26b).

Exhibit IV-26b
Type of Rent Reasonableness Documentation for New Admissions and Annual Recertifications

Type	2010		2011		2012	
	New Admissions	Recertifications	New Admissions	Recertifications	New Admissions	Re-certifications
A Signed Statement Certifying the Rent is Reasonable	69%	67%	57%	52%	55%	48%
Comparable Units Documented by the Property Owner in Section 12a of HUD 52517	5%	9%	10%	7%	12%	11%
Comparable Units Documented on Other Documents	23%	19%	29%	35%	31%	34%
Any Other Reference to Rent Reasonableness	3%	5%	3%	6%	3%	7%
Total	**100%**	**100%**	**100%**	**100%**	**100%***	**100%**

Data in this exhibit are weighted.
*Totals may not add up to 100% due to rounding

HUD requires that rent reasonableness determinations are conducted before signing the contract and lease. The timeliness of the rent reasonableness determination was evaluated by comparing the lease date (depending on the type of transaction, the lease date is the effective date of the current contract rent or the lease start date) with the rent reasonable certification date in the case file. Since the PHA is required to conduct a rent reasonableness assessment when the contract rent is increased by the owner, the current contract rent is compared with the previous rent amount to determine when and if there was a change in the contract rent. This data is used to determine whether there was a timely rent reasonableness assignment. Exhibit IV-27 provides a summary of how the date of the rent reasonableness documentation relates to the initial lease date or contract rent change date for those households where a reference to the rent reasonableness determination was found in the file.

Exhibit IV-27
Timing of Most Recent Rent Reasonableness Determination—
New Admissions and Annual Recertifications

Determination-Certification Chronology	2010		2011		2012	
	New Admissions	Recertifications	New Admissions	Recertifications	New Admissions	Recertifications
More than 4 Months Before Lease Date	2%	7%	3%	17%	5%	18%
Up to 4 Months Before Lease Date	94%	82%	87%	73%	90%	69%
Up to 2 Months After Lease Date	4%	4%	5%	3%	5%	5%
Greater than 2 Months After Lease Date	0%	5%	3%	3%	1%	4%
Date Missing	1%	2%	1%	5%	0%	4%
Total	**100%**	**100%**	**100%**	**100%**	**100%***	**100%**

Data in this exhibit are weighted.
*Totals may not add up to 100% due to rounding.

If the effective date of the lease with the current contract rent occurred prior to the date of the rent reasonableness documentation, rent reasonableness may not have been considered as a factor in approving the unit's rent. The percent of rent reasonable determinations made after the rent had been established as part of the initial lease agreement decreased from 8 percent in FY 2011 to 6 percent in FY 2012 for New Admissions. For Annual Recertifications in FY 2012, the percentage of rent reasonable documentation dated after the effective date of a lease increased from the previous study year (9 percent compared with 6 percent in FY 2011).

Conclusion. PHAs are not fully documenting rent reasonableness determinations as required by HUD regulations, and a large percentage of existing rent determinations have been made on the basis of less formal means of evaluating rents. Timely reviews increased in FY 2012 compared to FY 2011 for New Admissions and decreased slightly for Recertification transactions. The proportion of cases lacking rent reasonableness documentation is high (19 percent of new admissions and 24 percent of annual recertification transactions). These findings may be attributed in part to the PIH notice issued May 16, 2003 (notice PIH 2003-12) that supports a more simplified rent reasonable determination process. PIH 2003-12 states that a PHA need not consider all nine criteria cited in 24 CFR 982.507(b) to fully comply with the regulation. It justifies less formal methods of rent determination, stating that "each PHA should use appropriate and practical procedures for determining rental values in the local market."

G. Utility Allowance Analysis

As part of the FY 2012 HUDQC study, two separate analyses were conducted of the utility allowances provided to households through the PHA-administered Section 8 program. The first analysis focused on whether there was documentation in the tenant file indicating how the utility allowance amount used in rent determination was calculated, and whether those documents were used correctly in calculating the utility allowance amounts. The second analysis focused on

identifying discrepancies between the utility allowance on the Form HUD-50058 and the appropriate utility allowance as listed on a PHA staff-provided utility allowance schedule. These schedules often varied within a county by unit type, effective date of recertification and location.

Documentation of Utilities and Utility Allowance Values. PHAs were asked to provide information about the forms used to document and calculate the utility allowance, and to provide the utility allowance schedules used for actions effective in FY 2012. In addition, field interviewers were asked to copy documents showing calculation of utility allowances found in tenant files at the PHA office.

One hundred and fifty-eight distinct PHA-administered Section 8 "projects" were selected in our study sample. These Housing Choice Voucher projects, administered by 135 housing authorities (several of these housing authorities administered the program in multiple counties), participated in the FY 2012 HUDQC study. According to information provided at the PHA level by 151 projects, almost half (46%) of the projects used Form HUD-52517 (Request for Tenancy Approval) as the official source for identifying the utilities for which the households were responsible. This is the same percentage as the FY 2011 HUDQC study. The number of projects using the Form HUD-52667 (Schedule of Allowances for Tenant Furnished Utilities) to calculate the value of the utilities paid by the tenants increased from 67 percent in FY 2011 to 70 percent in FY 2012 among the 145 projects reporting utility allowance calculation. Exhibit IV-28a provides the information on the type of documents used as the official source for identifying utilities for which the households were responsible, and the type of documents used to calculate the value of the utilities paid by the tenants.

Exhibit IV-28a
Types of Documents Used by PHAs to Identify Utilities and Calculate the Utility Allowance Value

Document Used	Identifying Utilities				Calculating the Utility Allowance Value			
	2011		2012		2011		2012	
	Number	Percent	Number	Percent	Number	Percent	Number	Percent
Form HUD-52517 (Request for Tenancy Approval)	61	46%	69	46%	13	10%	18	13%
Form HUD-52641 (HAP Contract)	23	17%	32	22%	9	7%	7	5%
Form HUD-52667 (Allowance Schedule)	22	17%	21	14%	88	67%	102	70%
Other (Lease, Reports, Comparisons)	17	13%	19	13%	21	16%	12	8%
Exhibit IV-28a Various Combinations of Above	9	7%	10	7%	1	1%	6	4%
Total	**132**	**100%**	**151**	**100%***	**132**	**100%***	**145**	**100%**

Data in this exhibit are not weighted.
* Totals may not add up to 100% due to rounding.

Comparison of Form HUD-50058 Utility Allowance Values to Worksheets Found in the Household File. Seven hundred and ninety-nine (799) households from the PHA-administered Section 8 Voucher program were selected for this study. Field interviewers were able to locate worksheets or other documents indicating how the utility allowance was calculated for 750 households (91%).

For each household with utility allowance documentation available, the utility allowance amount from the 50058 Form was compared to the amount on the utility allowance worksheet obtained from the tenant file. For 93 percent (734) of these households, the Form HUD-50058 utility allowance amount matched the worksheet amount. This included 73 households that did not have any utility expenses because either the utility expenses were included in the rent or the owner paid all utilities. For less than 1 percent of the households, the worksheet provided was for the incorrect period of time or was missing critical information. Hence, we could not determine whether the utility allowance amount used in the rent calculation was correct. In the remaining 6 percent of the households, there were discrepancies between the amount on the worksheet and the Form HUD-50058 amount. Exhibit IV-28b provides a summary of the findings comparing the utility allowance listed on the Form HUD-50058 and the amount on worksheets found in tenant files.

Exhibit IV-28b
Comparison of Utility Allowance on the Form HUD-50058 to the Utility Allowance Worksheet

Outcome	Number	Percent
50058 Form (AC) Amount Matched with Worksheet (WS) Amount	734	93%
Worksheet in File for Incorrect Period of Time or is Missing Critical Information	3	<1%
Discrepancy Due to Math Error or Other Clerical Errors	8	1%
Discrepancy—Unable to Determine Reasons	41	5%
Total	**786**	**100%***

Data in this exhibit are not weighted.
* Totals may not add up to 100% due to rounding.

Comparison of Form HUD-50058 Utility Allowance Values to the Correct (QC) Utility Allowance Value. The QC utility allowance amount was calculated in two steps. The first step was to identify the utilities for which the tenants were responsible by using documents—usually PHA utility allowance worksheets—found in tenant files that indicated those specific utilities. In the second step, the identified household's specific utilities were mapped onto the utility allowance schedule and the total was summed to determine the QC allowance amount.

The utility allowance amount on Form HUD-50058 was matched to the QC utility allowance amount. We were unable to calculate the QC utility allowance in 1 percent of the cases (6 households) because worksheets were not available and consequently the specific utilities paid by the household could not be identified. Furthermore, we were unable to calculate the QC utility allowance in about 2 percent of the cases because the worksheets in the files did not include specific utilities or other critical information needed for QC allowance calculation; another 4 percent could not be calculated due to the appropriate utility allowance schedule being unavailable. Exhibit IV-28c differentiates between the cases in which the QC allowance amount

was able to be calculated and lists the reasons and number of cases in which the QC utility allowance amount was not able to be calculated.

Exhibit IV-28c
Availability of All Information to Enable QC Utility Allowance Calculation

Outcome	QC UA Amount Calculated	Number	Percent
Appropriate Worksheet and Schedule Available	Yes	750	94%
UA Worksheet or Other Comparable Document Not Available	No	6	1%
Appropriate UA Schedule Not Available	No	29	4%
Worksheet was Missing Critical Information	No	14	2%
Total		**799**	**100%***

Data in this exhibit are not weighted.
* Totals may not add up to 100% due to rounding.

For 750 cases in which the QC utility allowance amounts were calculated, the QC utility allowance was compared to the Form HUD-50058 utility allowance amounts. In 93 percent of these households, Form HUD-50058 and the QC utility allowance values matched. The remaining 7 percent of cases where the values did not match were categorized into two broad categories, as either administrative errors or unknown (i.e., we were unable to determine the reason for the discrepancy in utility allowance amounts). Exhibit IV-28d presents the findings from this analysis.

Exhibit IV-28d
QC Utility Allowance Compared to Form HUD-50058 Utility Allowance

Outcome	Number	Percent
QC UA Matched Amount on Form HUD-50058	694	93%
Discrepancy Due to Math Error/Transfer Error	11	2%
Discrepancy—Unable to Determine Reasons	45	6%
Total	**750**	**100%***

Data in this exhibit are not weighted.
* Totals may not add up to 100% due to rounding.
Note: The QC rent that is calculated for this study uses the utility allowance amount from Form HUD-50058 and not the QC allowance amount that was calculated for this comparison.

H. Payment Standard Analysis

As part of the FY 2012 HUDQC study, a special analysis was conducted to determine whether PHAs are using the correct payment standard amount. This special analysis was conducted independently of the rent calculation error findings presented in another section in this chapter and did not affect rent calculation determinations. The payment standard analysis consisted of three parts: (1) the payment standard on Form HUD-50058 was compared to the payment standard schedules provided by the PHA; (2) the payment standard on Form HUD-50058 was compared to the Fair Market Rent (FMR) for the appropriate geographical area; and (3) the payment standards were compared to the FMRs to ensure that they fell between 90% and 110% of FMR for each project. The findings from these comparisons are presented below.

Background. Payment standards are used in the PHA-administered Section 8 Voucher program to determine the tenant's portion of the rent to owner. Payment standards must be kept current and set between 90% and 110% of the FMR. If a PHA does not ensure that their payment standards are within this range or if program administrators fail to apply the current payment standards, this will result in errors in tenant rent determinations.

There are a variety of ways PHAs may apply payment standards incorrectly that can result in errors in tenant rent. A PHA may have several payment standards for different geographic areas with complex borders, sometimes making it difficult to select the correct payment standard for any given address within the jurisdiction. Additionally, a household's payment standard amount is the lower of the payment standard based on family size or the payment standard for the size of the unit leased; program administrators could forget to use the payment standard based on family size if the household chooses to rent a smaller unit size than the amount provided by the size of their voucher. Other potential areas for error include whether a PHA has been authorized to use FMRs based on the 50th percentile of the rents in the area; whether the PHA has been authorized to use Success Rate Payment Standards based on the 50th percentile of rents; and whether the PHA continues to be eligible for these higher subsidy standards. Moreover, PHAs are only allowed to change a household's payment standard at the time of the annual recertification or before moving to a new address. Thus, even if a change in the family composition requires an interim recertification with several family members moving in or out, the payment standard used in determining the rent should not be changed at the interim recertification. Yet, despite the complexity of payment standard guidelines, most of the errors found in this review were not due to this reason.

Comparison of the Payment Standard on Form HUD-50058 to the Payment Standard Schedules Provided by the PHA. The first analysis consisted of comparing the payment standard on Form HUD-50058 (the actual, or AC payment standard) to the payment standard schedule (the quality control, or QC payment standard) provided by the PHA. For all voucher households in the study, the appropriate QC payment standard was selected and compared to the AC payment standard. The selection of the QC payment standard from the schedules provided by the PHA was based on:

- the lower of either the number of bedrooms in the unit or the number of authorized bedrooms for the household on the voucher,
- the Effective Date of Action, and
- the determination and application of any special exception to payment standard guidelines provided by the PHA staff.

For every household where the AC and QC payment standard did not match, a call was placed to the PHA staff for clarification and, when appropriate, payment standard schedules for previous years were collected. Discussions with projects regarding determination of the QC payment standard uncovered a host of other issues that required consideration when selecting the QC payment standard. The types of complications included:

- The use of the previous (higher) payment standard for the first recertification after a decrease in the payment standard amount. Exceptions for special circumstances, such as

living in a house with additional amenities or setting the payment standard to the gross rent for Enhanced Vouchers, were granted to some households.

- Higher payment standards for Exception Rent Areas.
- The use of payment standards from the initial housing authority for port-in households, with the understanding the rates would be adjusted at the next annual reexamination.
- Some PHAs had software systems that identified the lessor of gross rent or the payment standard to populate the payment standard field on Form HUD-50058.

There were 799 PHA-administered Section 8 Voucher households in the study. For the majority (84%) of the households, the AC payment standard matched the QC payment standard. There were 131 households (16%) with discrepant payment standards. Sixty-three (48%) of the households with discrepant payment standards were elderly or disabled households. Elderly and disabled households are identified separately because they are often entitled to individual exemptions to the payment standard rules. Discrepancies were attributable to one of seven common reasons, as listed in Exhibit IV-29a that summarizes the number and percent of households where the QC and AC payment standard did not match by the reason for the discrepancy. The most typical reason for a discrepancy between the AC and QC payment standard was that the project staff used the incorrect payment standard schedule. Also, the use of either the incorrect number of bedrooms or household members accounted for a cumulative 16 percent of the discrepancies found.

Exhibit IV-29a
Number and Percent of Households with Payment Standard Discrepancies

Reason	Number of Households (Elderly/Disabled)	Number of Households (Non-Elderly/Disabled)	Percent of Households with Discrepancies
Used Incorrect Number of Bedrooms/Household Member	8	13	16%
Used Incorrect Payment Standard Schedule	29	30	45%
Used Fair Market Rent Instead of the Payment Standard Amount	3	4	5%
Used Gross Rent Instead of the Payment Standard Amount	10	13	18%
Project Staff Made a Typographical Error	5	3	6%
Project Based Voucher: No Payment Standard (Section 11 Filled Out)	1	1	2%
Other Reasons--overdue recertification, used FMR rather than payment standard, typographic error, Enhanced Voucher	7	4	8%
Total	**63**	**68**	**100%**

Data provided in this exhibit are not weighted.

Comparison of the Payment Standard on Form HUD-50058 to the Fair Market Rent for the Appropriate Geographic Area. The second analysis consisted of comparing the payment standard on Form HUD-50058 to the FMRs for the appropriate geographic area. Correct payment standards could not be determined for 98 households. The payment standard for 637 of the

remaining households (91%) fell within the 90 percent to 110 percent FMR band; 37 of the households (5%) that fell outside of the 90 percent to 110 percent band used an amount that exceed 110 percent of the FMR, and 27 of the households (4%) used an amount that was less than 90 percent of the FMR. Exhibit IV-29b summarizes the number and percent of households by the relationship of the payment standard to the acceptable FMR. The table is based on data for cases where we were able to determine correct payment standards.

Exhibit IV-29b
Payment Standard Compared with the Fair Market Rent

Characteristic	Fair Market Rent			Percent of Cases Outside the 90% to 110% Band
	Under 90%	90%–110%	Over 110%	
Non-Elderly or Disabled	13	323	19	5%
Elderly or Disabled	14	314	18	5%
Total	**27**	**637**	**37**	**9%***

Data provided in this exhibit are not weighted.
*Totals may not add up due to rounding.

The analysis of cases that fell outside the 90 percent to 110 percent FMR band revealed that 9 percent of cases fell outside the FMR band for five general reasons: the incorrect number of bedrooms or household members was used, the incorrect payment standard was used, gross rent was used instead of the payment standard, project staff made a typographical error, or other reasons. Exhibit IV-29c summarizes the number and percent of households that fall outside the 90 percent to 110 percent FMR band by category.

Exhibit IV-29c
Details of Cases Falling Outside 90%–110% of the Fair Market Rent

Reason	Fair Market Rent		Percent of Cases Outside the 90% to 110% Band
	Under 90%	Over 110%	
Used Incorrect Number of Bedrooms or Household Members	4	10	22%
Used Incorrect Payment Standard Schedule	8	6	22%
Used Gross Rent Instead of the Payment Standard	8	4	19%
Project Staff Made a Typographical Error	0	1	2%
Other Reasons—overdue recertification, used 105 percent of FMR, software limitations, original payment standard over 110 percent, unable to determine a reason for the discrepancy	7	15	35%
Total	**27**	**36**	100%

Data provided in this exhibit are not weighted.

Comparison of the FY 2011 to the FY 2012 Payment Standard Analysis Results. The same payment standard analysis was conducted for the FY 2011 study. Of the 799 PHA-administered Section 8 Voucher households in the FY 2012 study, the AC and the QC payment standard matched for 668 (84%) of the households. Additionally, 64 (9%) of the households had payment standards that did not fall within the 90 percent to 110 percent FMR band. Of those 64 households, one case was an Enhanced Voucher and granted an exemption. Therefore, a total of eight percent

of the PHA-administered Section 8 Voucher households included in the FY 2012 did not meet HUD's payment standard requirements. Exhibit IV-29d summarizes the results from the FY 2011 and FY 2012 payment standard analysis.

Exhibit IV-29d
Comparison of the FY 2011 to FY 2012 Payment Standard Analysis

Characteristic	FY 2011		FY 2012	
	Number	Percent	Number	Percent
PHA-Administered Section 8 Voucher Sample	785	100%	799	100%
Households Where the AC and QC Payment Standard Did Not Match	143	18%	131	16%
Households Where the AC Payment Standard Did Not Meet the 90% to 110% FMR Threshold	38	5%	64	9%
Households That Were Not Exempt From the 90% to 110% FMR Threshold and Did Not Meet HUD's Payment Standard Requirements	38	5%	63*	9%

Data provided in this exhibit are not weighted.
*One case was not included in this count because it was an Enhanced Voucher.

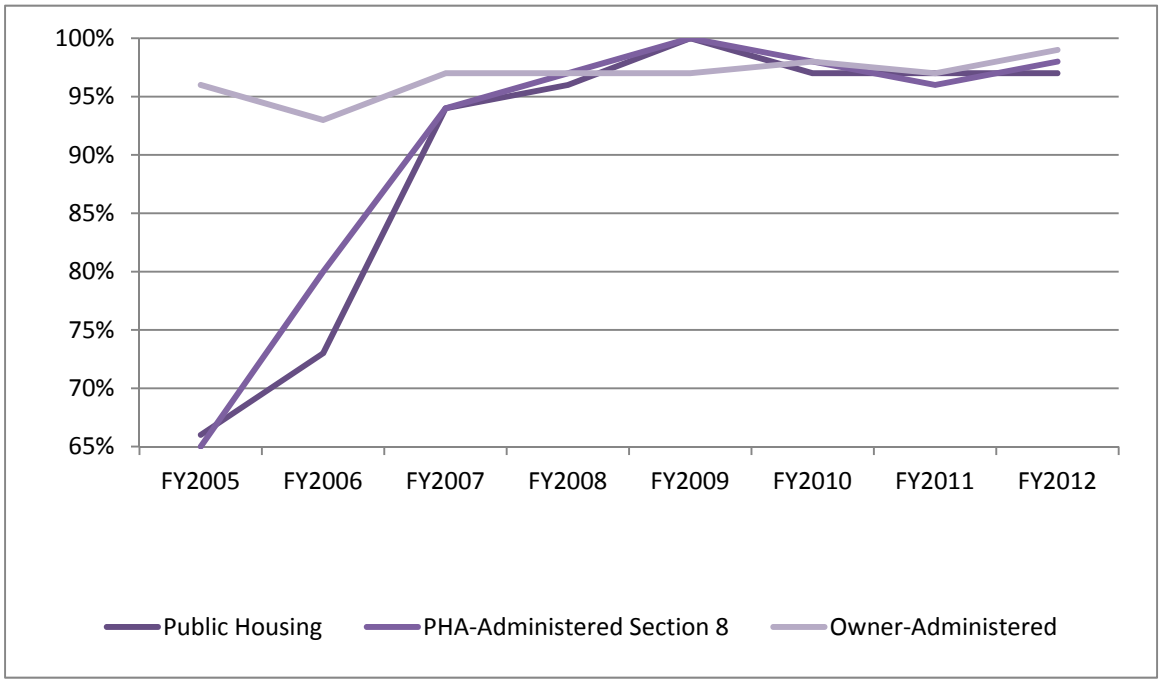
I. PIC/TRACS Analysis

In FY 2012, HUD provided PIC/TRACS data for all households within the sampled projects where data were present, even if the household was not selected for the QC study or if the specific study effective date and type of action did not match. In addition, head of household data were provided for all actions and updates within FY 2012, resulting in multiple observations per household. The households included in the QC study were matched against these PIC/TRACS data using identifying information (a combination of the Social Security Number, name, and date of birth) for each head of household in the study sample. However, since multiple PIC/TRACS observations were provided for each head of household, an additional effort was made to improve matching ICF's household sample to PIC/TRACS data. In addition to the match described above, we compared household data obtained during the QC study to PIC/TRACS data with the following certification information: program type, type of action, and effective date. Lastly, if duplicate observations for each head of household still remained, the transaction with the closest PIC/TRACS up-date date following the certification effective date was selected.

Utilizing this improved matching technique, 2,324 of the 2,404 households in the study, or about 97 percent, were fully represented by both head of household identifying information and certification data. This matching rate was an increase from FY 2011 and FY 2010 in which 70 percent and 71 percent of households, respectively, were fully represented by a match on both identifying information and certification data. Despite the improved matching rate, most of the PIC/TRACS analysis for this report was based on the broader match using identifying information to maintain consistency with past years. Using these criteria, PIC records were found for 98 percent of the households in PHA-administered projects, while TRACS records were found for 99 percent of the households in Owner-administered projects. Of the 2,404 households sampled, 2,349 households (or 98%) were successfully matched with PIC/TRACS. Figure IV-3 identifies the change in percentage of households in which PIC/TRACS was present over time as identified in

the HUDQC Study, beginning in FY 2005. PHA-administered percentages have increased since FY 2005, while Owner-administered percentages have remained fairly steady over time.

Figure IV-3
PIC/TRACS Data Present by Program Type for All Households over Time



Analysis was conducted to compare the average dollars in gross rent error for households that had records in PIC/TRACS with those that did not. Exhibit IV-30a provides the percentage of households in each of the three program types by whether or not data for the household were available in PIC/TRACS (present or absent) and the average dollars in gross error based on all households in the study. Exhibit IV-30b provides the same information but only for those households that had rent error. These exhibits illustrate that the rate for which PIC/TRACS data were present was comparable between all households and only those households with rent error.

Exhibit IV-30a
PIC/TRACS Data by Program Type and Average Gross Dollars in Error for All Households

Administration Type	PIC/TRACS Present		PIC/TRACS Absent	
	Percent of Households	Average Dollars in Error	Percent of Households	Average Dollars in Error
Public Housing	97%	$13	3%	$31
PHA-Administered Section 8	98%	$16	2%	$17
Total PHA-Administered	*98%*	*$15*	*3%*	*$23*
Total Owner-Administered	99%	$11	<1%	<$0
Total	**98%**	**$14**	**2%**	**$20**

Data provided in this exhibit are weighted.

As presented in Exhibit IV-30b, the average dollars in gross rent error for PHA-administered projects was higher for households in error when PIC/TRACS data were absent ($62) than when PIC/TRACS data were present. More specifically, the largest difference in average gross error dollars was found for Public Housing households, with and without PIC/TRACS data present ($53 and $67, respectively). However, because the number of cases absent from PIC/TRACS is relatively low, these estimates are less reliable and more volatile from year to year. This year, all Owner-administered households in error had PIC/TRACS data present, a slight increase from past years (from 98% in FY 2010 and 97% in FY 2011).

Exhibit IV-30b
PIC/TRACS Data by Program Type and Average Gross Dollars in Error for Households in Error

Administration Type	PIC/TRACS Present		PIC/TRACS Absent	
	Percent of Households	Average Dollars in Error	Percent of Households	Average Dollars in Error
Public Housing	95%	$53	5%	$67
PHA-administered Section 8	98%	$53	2%	$57
Total PHA-Administered	*97%*	*$53*	*3%*	*$62*
Total Owner-Administered	100%	$42	-	-
Total*	**98%**	**$50**	**2%**	**$62**

Data provided in this exhibit are weighted.
*Totals may not add up to 100% due to rounding.

Exhibit IV-30c presents the percentage of households and average dollars in error for households matched/not-matched with PIC/TRACS by payment type. Although the percentage of underpayment, overpayment, and proper payment are similar, both where PIC/TRACS was present and where it was absent, there was a large difference in underpayment amounts (i.e., $59 average underpayment error when PIC/TRACS data could not be matched, compared to $112 underpayment error when PIC/TRACS data were not matched). Interestingly, for households with overpayments, average dollars in error were less when PIC/TRACS was absent than when it was present (i.e., $26 compared to $40). However, because there are fewer cases where PIC/TRACS was absent, the average dollars in error amounts can vary significantly from year to year.

Exhibit IV-30c
Average Gross Dollars in Error by Payment Type and PIC/TRACS Data

Payment Type	PIC/TRACS Present		PIC/TRACS Absent	
	Percent of Households	Average Dollars in Error[1]	Percent of Households	Average Dollars in Error[1]
Underpayment	16%	$59	14%	$112
Overpayment	12%	$40	19%	$26
Proper Payment	72%	n/a	67%	n/a
Total	**100%**	**$14**	**100%**	**$20**

Data provided in this exhibit are weighted.
[1] Average dollar error per under- and overpayment subgroups.

Exhibit IV-30d examines net and gross errors by program type and whether there was a PIC/TRACS match. This exhibit illustrates the importance of reviewing net error and gross error separately as their average dollar errors are substantially different.

Exhibit IV-30d
Average Net and Gross Dollars in Error by Administration Type and PIC/TRACS Data for All Households

Administration Type	Average Net Rent Error		Average Gross Rent Error	
	PIC/TRACS Present	PIC/TRACS Absent	PIC/TRACS Present	PIC/TRACS Absent
Public Housing	-$3	-$12	$13	$31
PHA-Administered Section 8	-$4	-$12	$16	$17
Total PHA-Administered	*-$4*	*-$12*	*$15*	*$23*
Total Owner-Administered	-$5	<$0	$11	<$0
Total	**-$4**	**-$10**	**$14**	**$20**

Data provided in this exhibit are weighted.

For households in which PIC/TRACS data matched on specific study effective date and type of action (2,324 of 2,404 households), further analysis was conducted to determine whether certain key variables matched. The key variables included gross income, net income, and tenant rent for Moving to Work (MTW) households, and gross income, net income, total tenant payment, and tenant rent for non-MTW households.[37] Exhibit IV-30e provides the percentage of households in which the data gathered through the QC process matched that in PIC/TRACS.

Exhibit IV-30e
Percentage of Matched and Non-Matched Dollar Amounts for Key Variables Matching Variables from the Form HUD-50058/50059 and PIC/TRACS

Match Status	Gross Income		Net Income		Total Tenant Payment*		Tenant Rent	
	PIC	TRACS	PIC	TRACS	PIC	TRACS	PIC	TRACS
No Match	1.6%	3.4%	1.8%	4.2%	1.4%	16.3%	22.9%	37.0%
Match	98.4%	96.6%	98.2%	95.8%	98.6%	83.7%	77.1%	63.0%
Total	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**

Data provided in this exhibit are weighted.
* Note: Total Tenant Payment PIC results exclude MTW households.

[37] MTW Form HUD-50058 and corresponding PIC database do not have a field for total tenant payment and, therefore, the variable could not be analyzed for MTW households.

J. Project Staff Questionnaire Analysis

The purpose of the Project Staff Questionnaire (PSQ) is to obtain information on PHA and project practices and procedures, to better understand how programs are administered, and to identify difficulties and potential areas for improvement with respect to certifications and rent calculation. PHAs and project staff identified as the point of contact for the FY 2012 study were surveyed using a self-administered, Web-based questionnaire. The PSQ surveyed respondents on topics related to PHA/project staffing, certification and verification processes, use of automated systems, and quality control procedures. The results were analyzed separately for three major program types: Public Housing, PHA-administered Section 8, and Owner-administered programs.

A brief summary of the key findings from this analysis is presented below. A more detailed summary of the Project Staff Questionnaire information is found in Appendix F.

- **PHA/Project Staffing.** This section of the PSQ included questions regarding the number and types of staff, average caseload, staff turnover, minimum education requirements, training and experience requirements for new staff, and development and training for all certification staff. The findings of this section show:
  - The average PHA/project had about 14 employees including full-time, part-time, and contractual staff over the past 12 months. On average, 225 cases were assigned to each certification staff across all 3 program types over a 12-month period.
  - The percentage of PHAs/projects that assigned certification activities to new staff members was about 48 percent in FY 2012, and the number of new staff hired averaged about two staff per PHA/project. The average number of experienced staff assigned to conduct certification activities was about five staff per PHA/project.
  - The percentage of PHAs/projects in the study that had at least one staff member leave in the past 12 months was 37 percent. On average, PHAs/projects had two certification staff leave the PHA/project in the past 12 months. The most common reason for staff turnover was resignation due to better opportunity or career change (32%). Twenty percent of the PHAs/projects reported they had staff turnover due to interagency or interdepartmental transfer.
  - The most frequently endorsed minimum education requirement for employees working with certifications continued to be a high school diploma or equivalent. Sixty-two percent of the PHA/projects had this requirement. However, there was a slight decline for this requirement in the past two study years, both FY 2011 and FY 2012 studies had 66 percent of PHAs/projects with this requirement. Overall, only about four percent of PHAs/projects did not require some education, up from three percent in FY 2011.
  - The requirements for new certification staff included background checks, housing-related training and skills, and other basic skills. Seventy percent of PHAs/projects indicated they required background checks for applicants and 51 percent indicated they required some housing-related experience.
  - The PSQ also collected information about the amount and type of training provided to new and experienced staff. The average number of hours of training received by each newly hired certification staff decreased significantly to 82 hours in FY 2012 when compared to

the 130 hours of training received in FY 2011. Also compared to FY 2011, where PHAs/projects provided comparable hours of training to re-assigned staff and experienced staff (49 hours and 45 hours, respectively), in FY 2012 PHAs/projects provided more training to re-assigned staff. Re-assigned certification staff received an average of 47 hours of training, while experienced staff received 31 hours. The skill or training PHA/project staff considered most important was a general understanding of HUD and PHA policies (58%).

- **Certification Process.** The PSQ collected information on an array of topics regarding the certification process. It surveyed respondents about the amount of time allowed for the certification process, methods and any tools used to conduct the certification, and methods used to certify households with non-English-speaking tenants. The analysis of this section revealed several things:
  - Owner-administered projects were more likely to mail letters to tenants more than 90 days prior to the next effective date and were in general more likely to start interviewing the household sooner than Public Housing and PHA-administered Section 8 projects.
  - PHAs/projects conducted an in-person interview to gather information during move-in/initial certifications, in 90 percent of cases. Likewise, the majority of PHAs/projects, at 86 percent of cases, used this method for annual certifications. This is a sharp shift from FY 2011, where telephone interviews were the dominant mode of collecting household information for move-in/initial certifications (91% of cases), and where using a form was the dominant mode for annual certifications (85% of cases).
  - PHAs/projects mostly used a formal guide or set of questions to conduct the certification interviews (87%). Owner-administered projects were most likely to use a formal guide (93%), whereas Public Housing projects were least likely to use a formal guide (82%).
  - Over 65 percent of PHAs/projects indicated that they have tenants who speak a language other than English as their primary language. Of the projects that had non-English speaking tenants, an average of 28 percent of tenants spoke a language other than English as their primary language.
- **Verification Process.** The PSQ collected information on various topics regarding the verification process, including the frequency of verification requested by PHA/project staff about household member characteristics, income and expenses, problems in obtaining complete verification, the cooperativeness of various institutions to verify tenant information, and measures taken to obtain outstanding verification requests. The aggregated data on verification practices conclude the following:
  - Over 94 percent of the PHAs/projects indicated that they verify all income items (e.g., employment income, income from assets) during both move-in and annual certifications. In addition, over 91 percent of the PHAs/projects indicated that they verify all expenses items (e.g., medical expenses, childcare expenses) during both move-in and annual certifications. Almost all PHAs/projects indicated they verify static information such as date of birth, social security numbers, and citizenship information during move-in certifications, and more than 44 percent indicated they verify these identifiers at both move-in and the annual certifications.

- Seventy-five percent of the PHAs/projects cited incomplete or inaccurate third-party contact information as a cause of failing to obtain complete verifications. Additionally PHAs/projects cited noncooperation with various types of institutions in the pursuit of complete verifications, including employers, tenants, financial institutions, healthcare providers, social services agencies, insurance companies, and educational institutions.
- Seventy percent of PHAs/projects sent follow-up letters to third parties who were not responsive to completing verification requests. PHAs/projects also sent follow-up letters to tenants (59%), called third parties to obtain information (44%), called tenants (43%), and used electronic verification or data matching such as EIV (42%) to obtain complete verification of an income, asset, expense, or household characteristic. On average, 31 percent of PHAs/projects reported accepting other less preferred verification, a slight increase from 28 percent in FY 2011. However, this rate is still down from 67 percent in FY 2010 and 75 percent in FY 2009.

- **Use of Automated Systems.** The PSQ collected information on the use of automated systems. These questions inquired about the capabilities and limitations of the software used by the PHAs/projects and, more generally, the PHAs/projects use of computers to assist in the certification process. The results of this analysis indicate:
  - Automated systems and computer software continues to play an increasingly integral part in PHAs/projects' daily tasks. In the past 12 months, almost all PHAs/projects utilized computers and computer software when performing various certification and other administrative tasks (96%). Of those PHAs/projects, over 91 percent used computer software to submit data to PIC/TRACS.
  - The most common use of the software was printing Forms HUD-50058/50059 (98%), followed by calculating rent, income, or allowances and printing letters to tenants (97%, each). Only about 20 percent of the PHAs/projects indicated they used a software program for assistance with household interviews.
- **Quality Control Procedures.** The PSQ collected information on four aspects of quality control procedures: prevalence and causes of errors, characteristics of households that were more likely to have errors, measures taken to rectify or prevent errors, and suggestions on how to overcome errors. Errors were defined as overdue certifications, missing verification documents, and mistakes in calculating rent. Measures taken to reduce errors included developing methods used to select cases for review and the frequency of their review, tools and techniques used to monitor the certification process, implementing external reviews and monitors, strategies used to address various causes of errors, and methods used to clarify and implement HUD policies. The findings of this analysis conclude the following:
  - Ninety-one percent of PHAs/projects review tenant files as a quality control measure after certifications have been conducted in some form. In determining which cases to select for review, PHAs/projects most frequently used the method of randomly spot checking a percentage of all cases (85%). Overall, 25 percent of PHAs/projects reported reviewing all cases, which is a sharp decrease from 40 percent in FY 2011.
  - Ninety-one percent of PHAs/projects appointed a team leader or supervisor to monitor certification work. Of the remaining types of personnel most frequently used to monitor certification work, 75 percent used outside auditors and 63 percent used HUD or a HUD

contractor to oversee the process. With respect to techniques used to monitor certifications, 66 percent of PHAs/projects indicated that reviewing files after completion was the most effective method to identify errors.

- Sixty-five percent of the PHAs/projects indicated that upon reviewing certifications they frequently found cases with missing or incomplete verifications of income. Fifty-seven percent of the PHAs/projects indicated they frequently found cases with mistakes in calculating rent and 56 percent indicated they found cases with missing or incomplete verification of expenses. PHA/project staff reported that most frequent cause of error was inaccurate or incomplete information provided by tenants (89%).
- Forty-five percent of the PHAs/projects who reported conducting file reviews stated that certain types of tenants were more likely to have errors than other types of tenants. Of the PHAs/projects that responded, 31 percent of these PHAs/projects indicated that households with volatile incomes were more likely to have errors, followed by households with multiple incomes (27%).
- Forty-two percent of the PHAs/projects that described their strategies to reduce error indicated that they communicate with their tenants by sending physical letters with important dates and information in addition to requesting additional interviews and self-documentations. Forty-one percent of PHAs/projects also indicated that they train staff members on policies, procedures, and topics that cause the greatest number of errors.
- Seventy percent of PHAs/projects had suggestions regarding how to help the PHAs/projects minimize errors. The most common suggestion addressed HUD policies. Thirty-nine percent of the PHAs/projects that responded indicated HUD policies should be simplified. Another 34 percent indicated that project-specific and tenant-specific issues, needed to be addressed, such as increasing the number of staff, training more staff, or increasing tenant outreach/education. Thirty-one percent indicated that certification documentation, process and procedures should be improved; 28 percent indicated verification tools, processes and policies should be improved; and 27 percent indicated there should be general improvement in EIV.
- Fifty-nine percent of PHAs/projects indicated that when they had questions concerning HUD policies they were most likely to ask a HUD field office staff or other HUD staff. PHAs/project staff also employed other methods of clarifying HUD policies, such as referring to their HUD/PHA/Owner manual (56%) and using Internet/Web-based information or training (53%).

K. Multivariate Analysis

The FY 2012 HUDQC multivariate modeling followed the conceptual and analytical approaches used in previous years, with some technical changes. The analysis identified large patterns in which rent errors related to project and household variables. The findings were essentially similar to those reported in prior years' analyses, with the exception that differences among program types were not found to be statistically significant with regard to gross rent error, subsidy overpayment, and subsidy underpayment, net other project and household effects. More information on the multivariate analysis can be found in Appendix G.

Project-Caused Errors. Project-caused errors accounted for a large proportion of gross rent error, controlling for other effects. Of the project-caused errors, transcription errors, overdue recertification errors, the rate of items with transcription error, and the rate of items without third-party written verification predicted a higher gross error. Transcription error was a source of high subsidy overpayment and underpayment as well. The rate of items with transcription error related to higher overpayment and underpayment, and the binary-coded transcription error related to higher subsidy overpayment.

In addition, calculation errors, an indicator of numerous subtypes of calculation mistakes, were found to be related to lower gross rent error and underpayment error in a moderate but statistically significant way. This finding seems to imply that calculation processes might generate errors that offset each other, ending up with an average lower rent error. However, further examination is needed to better understand this relationship. The major findings on effects of project-caused errors were comparable with those from previous years' analyses (i.e., FY 2008–FY 2011), underscoring the importance of reducing project-made errors, particularly transcription errors and overdue recertification, in minimizing rent errors.

Household Characteristics. Household background variables were strong predictors of gross rent error, subsidy overpayment and underpayment. Variables indicative of complex financial conditions and income strongly predicted higher rent errors. The relationships between household financial/demographic variables and rent errors are highly consistent across models and years, a finding suggesting robust and continuing household risk factors with which housing projects must cope.

Project Characteristics and Operations. The impact of project characteristics and project operations on improper payments remained elusive within the current data analysis. Most key indicators of project resources, staff capacity, training, certification procedures, computer application, and a broad array of quality control efforts were not found to be statistically significant and no substantial relationships were found with rent error measures. There were a few estimates generated from modeling that were statistically significant; however, when examined across models or compared with prior years' analyses, they indicated trivial, unstable, or inconsistent project effects. As project management and operations are considered important factors in improper payment reduction, it is necessary to continue in-depth analysis with improved measurement of project features in the Project Staff Questionnaire to reveal the connections between PHA/project practices and rent error.

To explore factors influential to project-caused errors, logistic and linear regression analyses were conducted to account for transcription error (percent and counts), lack of third-party written verification, overdue recertification error, and the total number of project errors. Instead of using the same set of predictor variables used in the rent error modeling, stepwise selection was used to identify predictor variables that were most predictive of each project error, since different factors may underlie different project errors. The analyses generated evidence that there were different factors at work to explain project errors. Transcription error was related to project operations (frequent use of personal interview in certification and the extent of computer application in operation), as well as complex household situations (earned income, number of sources of incomes and expenses, and allowances). In contrast, overdue certifications were associated with only

housing program type (Public Housing and PHA-administered Section 8) and project issues such as case load and staff capacity.

Future research is needed to further refine the measurement of project-made errors to allow more meaningful quantification of the relationships among project errors and their unique and joint effects on rent error. This calls for a better understanding of the nature of each type of project error and the underlying processes that lead to the error. Through clear conceptualization and solid measurement of project errors, we may be able to improve the analysis of project-caused errors to generate actionable information.

Model specifications may be improved in future data analysis as well, using alternative or different predictors for gross rent error, underpayment, and overpayment. This analysis explored modeling project-caused errors with a more empirical approach (regression stepwise selection); but a more comprehensive understanding of the various projects' housing management practices could improve the analysis. Combining the insights from the housing management operation and data-driven techniques, it is possible to build more succinct and predictive models to help elucidate complicated factors contributing to subsidy rent errors and project-caused errors.

L. The 20 Largest PHAs Study

The 20 Largest Public Housing Authorities (PHAs) Study aims to provide additional information about the 20 largest PHAs. Included in this study were the 18 largest PHAs and the two largest state PHAs in the project-level sample selected for the HUDQC Study. There were 32 households selected from most PHAs, but 36 households in PA002, 60 households in RQ005, and 124 households in NY005, for a total of 764 households. Most PHAs represented both Public Housing and PHA-administered Section 8 Voucher households. MA901 and NY110 only represented Housing Choice Voucher households and RQ005 only represented Public Housing households. Weights for the 20 Largest PHAs Study were not calculated and as a result all data presented in the exhibits of this section that pertain to the 20 largest PHAs are not weighted.[38]

Administrative Error. Exhibit IV-31a provides the percent of households that had overdue recertification and transcription errors, and the percent of income and expense items that were verified by PHA staff with both written third-party verification only and verbal or written third-party verification, documentation, or Enterprise Income Verification (EIV)/Upfront Income Verification (UIV). These types of administrative errors were examined because they are typically associated with overall gross and net rent errors. Compared to all the QC study PHAs selected, the 20 largest PHAs had a slightly higher percentage of overdue recertification errors (1% and 6%, respectively) and a slightly lower transcription error rate (43% and 40%, respectively). Regarding the percentages of verified items, the 20 largest PHAs verified items using only third-party, in-writing verification, slightly less than the overall PHAs in the QC study (12% and 17%, respectively). Additionally, the 20 largest PHAs verified items using third-party verbal or in-writing, documentation or EIV/UIV within one percentage point of the PHAs in the QC study. More specifically, overdue recertification errors were relatively scarce with a notable exception of NY110 where 16 percent of households had overdue recertification transactions. While most of the 20 largest PHAs had transcription error percentages that were around the QC study mean, MA901,

[38] For a more detailed discussion regarding weighting for the 20 Largest PHA Study, please refer to Appendix B.

PA002 and NY005 were markedly greater than the QC study mean (69%, 69% and 60% of households, respectively). OH001 had the lowest percentage of households with transcription error, at 12 percent. With respect to verified items, RQ005 verified items using only third-party, in-writing verification at the greatest rate (27%), while NY110 and WA001 used this method of verification for the lowest percentage of households (each at 2%). Further, items were verified using third-party verbal or in-writing, documentation or EIV/UIV by CA002 for 100 percent of households, whereas NY005, PA002, and WA001 used one of these methods the least at 82 percent of households.

Exhibit IV-31a
Administrative Errors in the 20 Largest PHAs

PHA	Number of Households	Overdue Recertification Error	Transcription Error	Percent of Verified Items	
				Third-Party Verbal or in Writing, Documentation, or EIV/UIV	Third-Party in Writing
CA002	32	-	25%	100%	9%
CA004	32	-	56%	98%	9%
DC001	32	-	28%	89%	9%
FL005	32	-	38%	88%	5%
IL002	32	-	34%	92%	5%
IL025	32	-	44%	88%	3%
KY001	32	-	41%	88%	20%
MA002	32	-	53%	95%	12%
MA901	32	-	69%	93%	11%
MD002	32	-	28%	83%	12%
MO001	32	-	38%	93%	12%
NY005	124	2%	60%	82%	20%
NY110	32	16%	56%	88%	2%
NY904	32	3%	25%	89%	19%
OH001	32	3%	12%	95%	15%
PA002	36	3%	69%	82%	21%
RQ005	60	-	27%	87%	27%
TX009	32	6%	25%	85%	21%
WA001	32	-	41%	82%	2%
WA002	32	-	28%	85%	7%
Total/Average	**764**	**6%**	**40%**	**89%**	**12%**
QC Study Total/Average*	**2,404**	**1%**	**43%**	**90%**	**17%**

Data in this exhibit are not weighted.
* QC Study Total data are weighted with the exception of the QC Study average.

Payment Error. Exhibit IV-31b provides payment error information. This exhibit includes proper payments, underpayments and overpayments of tenant rents, and the mean gross rent errors by PHA. Compared to PHAs in our QC study as a whole, the 20 largest PHAs had a slightly higher percentage of households with proper payments (72% and 79%, respectively), as well as a slightly lower average gross dollar error (about $13 for the 20 largest PHAs, versus about $14 for the QC study). More specifically, the PHAs with the highest percentage of proper payments were OH001 and WA002, each at 94 percent of households. OH001 also had the lowest average gross dollar error at $0.69. Therefore, a large proportion of proper payments would seem to lead to small gross rent errors for PHAs. However, this was not always the case. For example, the PHA with the lowest percentage of proper payments was NY005 at 65 percent, with CA004 and MA901 in second, at 66 percent. While NY005 had one of the higher gross rent errors at $23.03, CA004 had a gross rent error of only $5.31. These results imply that while CA004 had a higher rate of rent error, the average dollar amount for each household was relatively small. Consequently, policies that increase proper payment rates may have little effect on decreasing rent errors (and vice versa). These seemingly related problems may sometimes require different approaches targeted to specific PHAs.

Exhibit IV-31b
Dollar Rent Errors in the 20 Largest PHAs

PHA	Underpayment	Proper Payment	Overpayment	Average Gross Dollar Error
CA002	9.4%	75.0%	15.6%	$5.78
CA004	15.6%	65.6%	18.8%	$5.31
DC001	6.2%	71.9%	21.9%	$12.88
FL005	12.5%	78.1%	9.4%	$18.91
IL002	3.1%	90.6%	6.2%	$2.09
IL025	9.4%	78.1%	12.5%	$5.75
KY001	9.4%	81.2%	9.4%	$4.94
MA002	9.4%	81.2%	9.4%	$11.19
MA901	25.0%	65.6%	9.4%	$18.13
MD002	3.1%	90.6%	6.2%	$18.87
MO001	6.2%	81.2%	12.5%	$2.16
NY005	15.3%	64.5%	20.2%	$23.03
NY110	6.2%	84.4%	9.4%	$36.31
NY904	12.5%	84.4%	3.1%	$4.75
OH001	0.0%	93.8%	6.2%	$0.69
PA002	11.1%	72.2%	16.7%	$25.69
RQ005	6.7%	91.7%	1.7%	$6.25
TX009	12.5%	84.4%	3.1%	$11.09
WA001	21.9%	75.0%	3.1%	$8.16
WA002	0.0%	93.8%	6.2%	$2.91
Total	**10.3%**	**78.7%**	**11.0%**	**$12.56**
QC Study Total *	**15.5%**	**72.2%**	**12.4%**	**$14.07**

Data in this exhibit for the 20 largest PHAs are not weighted.
* QC Study Total data are weighted with the exception of the QC Study average.

V. RECOMMENDATIONS

This section provides recommendations to improve the data collection process or the quality of the data used in the analysis, as well as policy actions that could possibly reduce error. Section A addresses policy recommendations. Section B discusses changes to the quality control process itself. These recommendations have not changed significantly from recommendations made in final reports from previous years. It is important for HUD to continue to learn more about local policies and procedures that impact error, as well as proven performance management and internal control strategies to reduce rent calculation error rates.

A. Policy Actions

This study was not designed to provide recommendations regarding basic program objectives and policies. However, the findings from this study suggest that some major procedural changes should be considered when establishing and revising policy. The recommendations in this section remain essentially the same. While HUD has begun several initiatives in the last few years, the errors associated with the programs included in this study are no longer decreasing. The suggestions below are examples of the type of actions that need to be taken. Overall PHAs/projects must be held accountable for their work, but HUD should provide them with the tools necessary to accurately administer the program.

1. **HUD should continue to require both PHAs and owners to use the information available through the Department of Health and Human Services' "New Hires" income matching database.** The majority of subsidy overpayment errors are associated with earned income, and a large majority of tenant income underreporting also relates to earned income. The "New Hires" income matching database provides the opportunity to correct errors associated with reported and unreported income. However, our experience working with the "New Hires" database indicates that caution needs to be taken when using the information. These data are extremely helpful in identifying unreported sources of income; however, the data are not current and often contain errors. It is difficult to ensure that income is counted only when it is clear that it is received by the tenant; the New Hires database should not be used as the sole source of verifying earned income.

2. **HUD should continue to use the EIV system to reduce the level of improper payments.** Increased use of EIV may help reduce errors associated with income reporting and assist in recovering payment errors. EIV is a proven strategy that should be maintained in conjunction with other income verification methods that capture more current and other sources of income data.

3. **HUD should continue expanding support of the occupancy function and conducting outreach campaigns to PHAs and owners to inform them of the Department's occupancy-related resources.** Providing a detailed and current occupancy handbook is essential, in addition to providing a mechanism for answering questions as they surface. HUD should develop a nationwide, consistent, reliable approach for providing guidance and support to both PHAs and owners.

   Also critical is a close link between the team that responds to field concerns and the staff responsible for writing HUD notices and guidance documents. The team responding to

field questions and concerns knows what problems program administrators face. These problems should be the subject of the guidance that comes from HUD.

4. **HUD should provide the PHA/owners with the forms, training, and other tools needed to determine rent correctly.** Rent calculation error could be reduced if HUD provides structured forms for interviewing tenants, obtaining verifications, and calculating rent. Ideally, these tools would be provided in the form of computer-assisted interview software that minimizes the number of questions that need to be asked. Such systems would ensure that tenants are asked about all income sources and expenses that affect their rent. Manuals and training materials explaining how to implement requirements correctly and calculate rent accurately should be provided. To the extent that HUD program rules can be simplified, provision of automated and manual tools may reduce rent calculation error.

   The Earned Income Disregard is one example of a difficult rule that PHA/owners need clearer guidelines and training materials in order to follow correctly. HUD can provide guidelines that include calculation sheets that are easy to follow and maintain. The calculation worksheet should provide step-by-step directions on how to calculate the percent of disregard for that year; a place to record the income that should be used to calculate the disregard (e.g., TANF, SS, SSI, Pension); easy to follow formulas; and end and start dates for the completion of the disregard. For more complicated cases in which the disregard should have been granted but was not, and the housing staff is now retroactively correcting the mistake, guidelines should be provided on how to implement the adjustment. Standardized documents should be provided for this adjustment to include the earned income amount to be used (i.e., current or based on the event start date). Finally, clear instructions should be provided on how to calculate the event start date and how far back the housing staff must go to retroactively give the disregard.

   In addition, HUD should consider developing a handbook that combines or cross references the rules and regulations for all rental assistance programs administered by HUD. Such a handbook would give staff a central source of information for all programs for which they are responsible, as well as potentially support the administration's efforts through the Rental Policy Working Group's Alignment to reduce redundancy among agencies.

   HUD experts and local housing staff should be given an opportunity to work together to develop these tools and systems needed to reduce rent error. Many local PHA/owners have already developed forms, training materials, manuals, automated systems, and monitoring processes that enable them to provide accurate, efficient service to the tenants they serve. HUD should learn from these PHA/owners and develop materials that will help those PHA/owners who, for one reason or another, have not been as successful.

5. **HUD should continue to implement its onsite monitoring program, and PHA/owners should be held accountable for implementing HUD regulations and calculating rent accurately.** An onsite monitoring system that includes reviews at both the local and Federal level is essential to improving accountability. PHA/owners with excessive errors should be required to develop corrective action plans and show improvement within specified time periods. HUD initiated extensive onsite monitoring efforts since the 2000 QC study, in contrast with its policies of most of the previous two decades. The most obvious explanation for the magnitude of error reductions in subsidy determinations between 2000 and FY 2009

is improved HUD monitoring and the expectation of such monitoring. However, as the dollars associated with rent error cease to decline, further action will be needed to help the PHAs and owners focus on policies and procedures that lead to error.

Monitoring can be conducted at a variety of different levels. We recommend that HUD require PHA/owners to perform their own QC reviews on a percentage of income determinations and rent calculations. Agencies that have aggressively sought to improve performance of their programs have had some significant successes, and one of the most frequently used error-reduction strategies includes the establishment of internal QC review procedures.

In addition to agency monitoring, HUD Field Offices and/or other national-level, well-trained staff should conduct a second review of a percentage of the cases reviewed at the local level to ensure the QC reviews are being conducted correctly, or select their own random sample of files for review. This type of oversight not only identifies errors, but also prevents them. In addition, it demonstrates HUD's concern with program integrity and improper payments and focuses PHA/owner attention on tenant income and rent.

6. **Federal laws, regulations, and HUD requirements should be simplified, to the extent possible.** The current statutory environment poses substantial obstacles to efficient, accurate income and rent calculations. It contains dozens of requirements that may all be well-intentioned and have potentially desirable impacts. However, taken as a whole, they make the income and rent determination process extremely complex. HUD has sought to issue guidance on virtually all aspects of current income and rent determination requirements, but some of the legislative provisions were written with little thought as to the implications for their administrative complexity. It may always be complicated to determine which income to count, which expenses to allow, and annualize that information in a program with multiple objectives. However, the various specialized provisions that relate to small subparts of the population could be eliminated or simplified.

   The policy related to students is an example of such complex policies. PHA and project staff members are required to gather a series of information to determine whether students continue to be eligible to receive assisted housing. For students who do not meet certain criteria, PHA/project staff members are required to determine the eligibility of the student's parents. This policy, while well-intentioned, adds to the complex rules PHA/project staff are required to implement when determining eligibility and calculating rent for assisted households.

7. **HUD should consider requiring some re-examinations to be completed less often than annually.** Many years ago, HUD conducted the re-examinations for elderly and disabled families biennially rather than annually. HUD should consider implementing this policy again on a permanent basis. With the time-savings made available by changing this policy, PHA/project staff could spend more time conducting required re-examinations; following up on suspected cases of fraud; and conducting more internal reviews of tenant files.

B. Modifying the Quality Control Process

ICF's current methodology to conduct the quality control study is based on meeting established study objectives and builds on the successes and failures of previous studies. The

recommendations below serve to expand the utility of the data collected, support HUD's research goals, and improve the overall efficiency of ongoing quality control studies.

1. **HUD should conduct updated studies to ascertain the billing error associated with the Public Housing, Section 8 Housing, Section 8 Housing Choice Vouchers and Moderate Rehabilitation, and Owner-administered programs.** These updated billing error estimates would provide a more accurate assessment of improper payments. In the *FY 2012 HUD Agency Financial Report*, billing error estimates are based on FY 2004 data for the Public Housing program and FY 2009 data for Owner-administered program. Current error estimates could be obtained by conducting primary data collection or by using statistical modeling to update the existing information.

2. **Consider conducting an in-depth quality control study of how utility allowance values are calculated and used in the rent calculation.** Such a study could involve collecting data from utility companies regarding utility usage for a given fiscal year and comparing actual consumption with the utility allowance values calculated by project staff. This investigation could also include an evaluation of the HUD Utility Schedule Model (HUSM) and its ability to accurately estimate utility costs for assisted housing tenants. In addition, HUD should collect other data using HUDQC Study's established research mechanisms.

   Data collected through the HUDQC Study provide detail that is not available through other HUD sources (e.g., PIC/TRACS). This data could be used to track such trends as the extent to which income and expense items are verified, or the number of sources of employment income received by a particular household or household member. Further, because of the sampling method used to identify projects and households in the study, other HUD-related topics in addition to the utility cost study could be investigated using the HUDQC Study's research mechanisms and data collection processes. The July 2013 issuance of the HUD Research Roadmap for FY 2014– FY 2018 also identified the rental integrity monitoring (RIM) review validation as tasks that could be incorporated into the HUDQC Study's data collection process.

3. **Consider conducting remote data collection with national estimates and a larger number of households per project.** Eliminating field data collection would eliminate the need to travel and the costs associated with travel. More importantly, the sample would not have to be geographically clustered. Projects could be sampled by project area using PPS and stratification. Stratification would guarantee diversity of projects and, unlike clustering, it would decrease the confidence interval of the estimates. This means that practically every state could be represented and precision increased to produce better estimates with the same sample size. The precision would be improved further by increasing the number of households per project. In this scenario, the number of projects to be sampled would be somewhat smaller and the number of households per project would be much larger. There are, however, some potential tradeoffs with remote data collection. PHAs/projects would be required to prepare and send tenant file information to study headquarters, taking up limited resources and time used for program administration and possibly affecting the quality of the data provided. Additionally, household interviews would be conducted over the phone and may not be as successful at collecting certification information as in-person interviews. However, remote data collection has its advantages and should be seriously considered for the HUDQC Study. A conversation with HUD would best address any

concerns about whether these potential tradeoffs of converting to remote data collection can sufficiently meet the study's goals.

Additionally, there are benefits to performing detailed analysis and data abstraction at HUDQC Study headquarters whether data is sent to study headquarters directly or through our field data collectors. Because of the diverse landscape of rental housing assistance program administration through the use of local discretionary policies, Moving to Work programs, and other special policies, it is important that the HUDQC Study staff remain agile and flexible to meet the changing data analysis needs for the study. Limiting the task of field data collectors to sending tenant file data and giving HUDQC Study headquarter staff the responsibility for data abstraction, creates communication efficiencies, supports streamlined data review, and implementation of more timely internal controls.

4. **Collect more information regarding PHA/project policies and practices.** Each PHA establishes its own policies, procedures, and forms for collecting information that is ultimately used to calculate tenant rent. The differentiation in these practices should have some (possibly major) impact on the rent error, yet the analysis of the project practices and characteristics collected in the Project Staff Questionnaire designed for this study does not demonstrate the expected impact. Therefore, we recommend that focus groups, interviews, and discussion with program administrators be used to identify additional PHA/project-level factors that may impact error. This additional information could be used to revise the Project Staff Questionnaire to include questions focused on the specific practices expected to influence errors. As the data already start to reflect, as rent error decreases it will become increasingly difficult for HUD and PHA/project staff to continue to make changes that will reduce the error. Analysis of more detailed, project-level data will assist in this process.

5. **Gather information to document the outcome of the HUD quality control studies.** Overall, the HUDQC studies indicate that both the percent of errors and dollars associated with those errors have decreased in the last 7 years. However, there is no information on changes in tenant behavior related to the identification and reduction of error. It is common to assume that reducing error would save HUD money. However, because housing programs managed by HUD are not entitlement programs (meaning not everyone who is eligible for the program is entitled to benefits), as soon as an ineligible household is removed from the roles, another household takes that household's place. The rental subsidy provided to the replacement household could be even higher than the subsidy for the previously subsidized household. The existing HUDQC Study identifies the dollars associated with error but does not identify an overall reduction in subsidy dollars. To fully understand the overall impact of the QC studies on subsidy funding, additional information is needed regarding both the tenants receiving the subsidies and the PHAs/projects administering the housing benefits.

6. **Expand contractor access to verification obtained through interagency agreements.** Despite increasing rates of third-party verification, a large proportion of tenant income and expenses are not being verified. This is especially important, given that study results indicate a significant relationship between third-party verification of certain types of income and rent errors.

   In the current study, household-level information was used to match sample household members with Social Security data. Through this electronic match, verification was ob-

tained for most sample household members' SSA and SSI benefits. However, there were many cases of household members in which a match between the study's electronic files and the SSA/SSI electronic files was not found when expected, and other situations in which irresolvable discrepancies were identified. These mismatches and discrepancies could be investigated further if access to the SSA/SSI database could be provided to the HUDQC Study research and survey staff.

7. **Continue to investigate PIC/TRACS data for sampling and other purposes.** Ideally PIC/TRACS data would be used to select the quality control sample and provide the actual data used by the PHA/project staff when calculating rent (in place of abstracting Form HUD-50058/50059 data from the tenant file). The most recent match of the study sample households with PIC/TRACS data indicated that 96 percent of the sample households are included in the PIC/TRACS databases. While this is slightly down from the FY 2010 match at 98 percent and the FY 2009 match at 99 percent, the general trend over time has been above 95 percent. We are at the point now where consideration should be given to using these data for selecting the household sample. However, using the PIC/TRACS data for selecting the household sample may not be appropriate, unless it is clear that data are available for the specific period of time covered by the study and provided for our review in a timeframe that meets our study schedule.

8. **Continue the HUDQC Study as a regular, ongoing effort to monitor, manage, and improve HUD rent determination processes.** The ongoing evaluation of HUD rental housing assistance programs is essential to program management and improvement. Rigorous research is important for understanding how well HUD programs are reaching their goals for communities. The primary objective of the HUDQC Study is to measure rent calculation and improper payment error. However, the study also gives HUD the opportunity to learn more about alternatives to reducing rent calculation errors and how to better manage current and changing conditions at PHAs/projects. Annual evaluations facilitate more accurate, cross-year comparisons of rent errors. They also allow for data collection and data-analysis staff to develop specific expertise within various HUD policy areas and develop tailored solutions for improving data quality.

Appendix A: Rent Calculations

APPENDIX A: RENT CALCULATIONS

1. **Public Housing**
   a. Obtain the Total Tenant Payment (TTP).
   b. Determine if the family includes any ineligible noncitizens. IF YES, **continue.** If NO, **go to d.**
   c. Determine if the family includes any citizens or eligible noncitizens. IF YES, **go to #6 (continuation of assistance).** IF NO, **go to #7 (temporary deferral).**

MARKER (marks the return point after determining continuation of assistance or temporary deferral status)

   d. Determine if the tenant selected Flat Rent. IF NO, **go to e.** IF YES, the QC RENT equals the Flat Rent. **Go to g.**
   e. Obtain the Utility Allowance.
   f. The amount of the tenant's rent (QC Rent) is the lower of: a. (TTP) minus e. (Utility Allowance), or the Flat Rent.[1]
   g. Determine if the QC Rent equals the Actual Rent. IF YES, **no error.** IF NO, **dollar error.**

2. **Section 8 Voucher Program**
   a. Obtain TTP.
   b. Obtain the Gross Rent.
   c. Obtain Utility Allowance.
   d. If a. (TTP) is greater than b. (Gross Rent), then set TTP to Gross Rent.
   e. Obtain Payment Standard[2] (the Payment Standard is based on the lower of the Unit [actual] Bedroom Size, and Family [eligible] Bedroom Size).
   f. Obtain the household's Adjusted Monthly Income.
   g. Subtract e. (Payment Standard) from b. (Gross Rent). If the Payment Standard is higher than the Gross Rent, use 0.
   h. Add a. or d. (TTP) to g. (Gross Rent minus Payment Standard).
   i. Determine if this is the initial occupancy for this dwelling unit. (Item 12b on the 50058 is yes). IF YES, **continue.** IF NO, **the Family Share = h. Go to l.**
   j. Calculate 40% of the f. (household's Adjusted Monthly Income).
   k. Determine if j. (40 percent of Adjusted Monthly Income) is equal to or greater than h. (TTP plus Gross Rent minus Payment Standard). IF YES, **the Family Share = h. Go to l.** IF NO, **procedural error. Family Share = h. Go to l.**

[1] If there is no Flat Rent, the QC rent will be the lower of the Ceiling Rent or a. (TTP), minus e. (Utility Allowance) to determine the dollar amount of error. If there is also no Ceiling Rent, the QC Rent will be a. (TTP) minus e. (Utility Allowance).

[2] For Project-Based Vouchers, the Payment Standard equals the Gross Rent.

l. Determine if the family includes any ineligible noncitizens. IF YES, **continue.** If NO, **go to n.**

m. Determine if the family includes any citizens or eligible noncitizens. IF YES, **go to #6 (continuation of assistance).** IF NO, **go to #7 (temporary deferral).**

MARKER (marks the return point after determining continuation of assistance or temporary deferral status)

n. Subtract c. (Utility Allowance) from the h. (Family Share). This is the QC RENT.

o. Determine if the QC RENT equals the ACTUAL RENT. IF YES, **no error.** IF NO, **dollar error.**

3. Section 8 Enhanced Voucher

a. Determine if household is receiving an Enhanced Voucher. If YES, **continue.** If NO, **use #2 (the regular Section 8 Voucher formula).**

b. Obtain the TTP.

c. Obtain the Gross Rent.

d. Determine the lesser of b. (TTP) or c. (Gross Rent).

e. Determine if the family includes any ineligible noncitizens. IF YES, **continue.** If NO, **go to g.**

f. Determine if the family includes any citizens or eligible noncitizens. IF YES, **go to #6 (continuation of assistance).** IF NO, **go to #7 (temporary deferral).**

MARKER (marks the return point after determining continuation of assistance or temporary deferral status)

g. Obtain the Utility Allowance.

h. Subtract g. (Utility Allowance) from d. (the lesser of TTP or Gross Rent). This is the Family Rent to Owner (QC RENT).

i. Determine if the QC RENT equals the ACTUAL RENT. IF YES, **no error.** IF NO, **dollar error.**

4. Project-Based Section 8, Section 202, Section 811, Section 8 Moderate Rehabilitation

a. Obtain the Gross Rent (Gross Rent equals the Contract Rent plus the Utility Allowance).

b. Obtain the TTP.

c. Determine if the family includes any ineligible noncitizens. IF YES, **continue.** If NO, **go to e.**

d. Determine if the family includes any citizens or eligible noncitizens. IF YES, **go to #6 (continuation of assistance).** IF NO, **go to #7 (temporary deferral).**

MARKER (marks the return point after determining continuation of assistance or temporary deferral status)

e. Obtain the Utility Allowance.

f. Determine if Subsidy Type on 50059 = PRAC. IF NO, **continue.** IF YES, **go to h.**

g. Subtract e. (Utility Allowance) from b. (TTP) or a. (Gross Rent) whichever is lower. This is the QC RENT. **Go to i.**

h. Subtract e. (Utility Allowance) from b. (TTP). This is the QC RENT.

i. Determine if the QC RENT equals the ACTUAL RENT. IF YES, **no error.** IF NO, **dollar error.**

5. Manufactured Home Space Rental for Section 8 Vouchers

a. Obtain the Rent to Owner.

b. Obtain the owner maintenance and management charges for the space.

c. Obtain the Utility Allowance.

d. Add together a. (Rent to Owner), b. (owner maintenance and management charges), and c. (utility allowance). This is the Space Rent.

e. Obtain the TTP.

f. Obtain the Payment Standard.

g. Subtract f. (Payment Standard) from d. (Space Rent). If Space Rent is less than the Payment Standard, use 0.

h. Add e. (TTP) to g. (the amount by which the Space Rent exceeds the Payment Standard). This is the Family Share.

i. Determine if this is the initial occupancy for this dwelling unit. (Item 12b on the 50058). IF YES, **continue.** IF NO, **the Family Share = h. Go to m.**

j. Obtain the household's Adjusted Monthly Income.

k. Calculate 40 percent of the household's Adjusted Monthly Income.

l. Determine if k. (40 percent of Adjusted Monthly Income) is equal to or greater than h. (TTP plus Space Rent minus Payment Standard). IF YES, **the Family Share = h.; go to m.** IF NO, **Procedural Error. The family is not entitled to assistance in this unit.**

m. Determine if the family includes any ineligible noncitizens. IF YES, **continue.** If NO, **go to o.**

n. Determine if the family includes any citizens or eligible noncitizens. IF YES, **go to #6 (continuation of assistance).** IF NO, **go to #7 (temporary deferral).**

MARKER (marks the return point after determining continuation of assistance or temporary deferral status)

o. Subtract c. (Utility Allowance) from h. (Family Share) to determine Family Rent to Owner (QC Rent).

p. Determine if the QC RENT equals the ACTUAL RENT. IF YES, **no error.** IF NO, **dollar error.**

Special Calculations for Household With Ineligible Noncitizens

6. **Continuation of Assistance**
   a. Determine if the family was receiving assistance on June 19, 1995. IF YES, **continue.** IF NO, the FAMILY is eligible for prorated assistance; **go to #8 (proration formula for Public Housing).**
   b. Determine if the FAMILY head or spouse is a citizen or eligible noncitizen. IF YES, **continue.** IF NO, the FAMILY is eligible for prorated assistance; **go to #8 (proration formula for Public Housing).**
   c. Determine if the FAMILY includes any ineligible members other than the head, spouse, and child or parent of the head or spouse. IF NO, **continue.** IF YES, the FAMILY is eligible for prorated assistance; **go to #8 (proration formula for Public Housing).**
   d. Determine if the FAMILY was granted continuation of assistance before November 29, 1996. IF YES, the FAMILY is eligible for full continuation of assistance. **Return to MARKER for the appropriate program type.** IF NO, the FAMILY is eligible for prorated assistance; **go to #8 (proration formula for Public Housing).**
7. **Temporary Deferral of Termination of Assistance**
   a. Determine if Temporary Deferral of Termination of Assistance has been granted. IF YES, **continue.** IF NO, **go to c.**
   b. Determine if 18 months have passed since Temporary Deferral was granted. IF YES, **continue.** IF NO, **the Family continues to be eligible for Temporary Deferral of Termination of Assistance; return to MARKER for the appropriate program type.**
   c. Determine if the FAMILY includes a refugee under Section 207 of the Immigration and Naturalization Act or an individual seeking asylum under Section 208 of that Act. IF NO, **continue.** IF YES, **the Family is entitled to ongoing Deferral of Termination of Assistance; go to MARKER for the appropriate program type.**
   d. Determine if the FAMILY was receiving assistance on June 19, 1995. IF NO, **continue.** IF YES, **the Family is eligible for Temporary Deferral of Termination of Assistance; go to MARKER for the appropriate program type.**
   e. Determine if the FAMILY is exercising its hearing rights (waiting for a decision from INS or Public Housing Authority [PHA]/Owner appeal). IF NO, **continue.** IF YES, **go to MARKER for the appropriate program type.**
   f. Determine if the PHA is making reasonable efforts to evict. IF YES, **go to MARKER for the appropriate program type.** IF NO, **Procedural Error,** HOUSEHOLD IS INELIGIBLE.
8. **Proration Formula for Public Housing**
   a. Determine if this is a Public Housing case. IF YES, **continue.** IF NO, **go to #9 (proration formula for all Section 8 programs).**
   b. Determine the number of FAMILY members.

c. Determine the number of eligible FAMILY members.

d. Obtain the TTP.

e. Obtain the 95th percentile of Gross Rents for similarly sized Public Housing units in order to determine the Public Housing maximum rent.[3]

f. Determine if the Family pays a Flat Rent. IF YES, **continue.** IF NO, **go to i.**

g. Obtain the Flat Rent.

h. If g. (Flat Rent) is greater than or equal to e. (Maximum Rent), there is no prorated rent. Use the Flat Rent; **go to n.** If g. (Flat Rent) is less than the e. (Maximum Rent), subtract the Flat Rent from the Maximum Rent. This is the Family's Maximum Subsidy. **Go to j.**

i. Subtract d. (TTP) from e. (Maximum Rent) to determine Maximum Subsidy.

j. Divide h. or i. (Maximum Subsidy) by b. (number of FAMILY members) and multiply by c. (number of eligible FAMILY members) to determine the Eligible Subsidy for the FAMILY.

k. Subtract j. (Eligible Subsidy) from e. (Maximum Rent) to obtain the prorated TTP.

l. Obtain the Utility Allowance.

m. The amount of the tenant's rent (QC RENT) is k. (prorated TTP) minus l. (Utility Allowance).

n. Determine if the QC RENT equals the ACTUAL RENT. IF YES, **no error.** IF NO, **dollar error.**

9. Proration Formula for All Section 8 Programs

a. Obtain the Rent to Owner (Voucher).

b. Obtain the Utility Allowance

c. Obtain the Gross Rent.
Voucher Gross Rent = Rent to Owner plus the Utility Allowance.
Owner-administered Gross Rent= Contract Rent plus the Utility Allowance.

d. Obtain the TTP.

e. Obtain the Payment Standard (Voucher).

f. Obtain the Housing Assistance Payment (HAP).
Owner-administered: HAP = Gross Rent minus TTP.
Voucher: HAP = Gross Rent or Payment Standard (whichever is less) minus the TTP.
Enhanced Voucher: HAP = Gross Rent minus the Payment Standard.

g. Record the number of FAMILY members.

h. Record the number of eligible FAMILY members.

i. Divide f. (HAP) by g. (total number of FAMILY members), and then multiply the result by h. (number of eligible FAMILY members) to obtain the prorated HAP.

[3] If Maximum Rent is not available, Fair Market Rent is used as a substitution for Maximum Rent.

j. Determine if Manufactured Home Space Rental. IF NO, **continue.** IF YES, **return to MARKER for the appropriate program type**.

k. Subtract i. (prorated HAP) from c. (Gross Rent) to obtain the prorated Family Share.

l. Subtract b. (Utility Allowance) from k. (Prorated Family Share) to determine the prorated QC RENT.

m. Determine if the QC RENT equals the ACTUAL RENT. IF YES, **no error.** IF NO, **dollar error.**

Appendix B: Weighting Procedure

APPENDIX B: WEIGHTING PROCEDURE

This appendix describes the procedures followed in weighting the project sample.

Study Population. The universe of the HUD Quality Control for Rental Assistance Determination Study included all projects and households located in the continental United States, Alaska, Hawaii, and Puerto Rico. In FY 2012, Moving to Work (MTW) Pubic Housing Authorities (PHAs) were included in the study population for the first time.

The following programs were included in the sample:

- PIH-administered Public Housing, including Moving to Work (Public Housing)
- PHA-administered Section 8, including Moving to Work (PHA-administered Section 8)
  - Moderate Rehabilitation
  - Housing Choice Voucher program
- Office of Housing-administered projects (Owner-administered)
  - Section 8 New Construction/Substantial Rehabilitation
  - Section 8 Loan Management
  - Section 8 Property Disposition
  - Section 202 Project Rental Assistance Contracts (PRAC)
  - Section 202/162 Project Assistance Contracts (PAC)
  - Section 811 PRAC

The initial universe files used to draw the sample occasionally reflected out-of-date or incorrect information, including out-of-scope projects such as demolished projects, projects undergoing renovation, projects that were no longer assisted, projects that had merged or split, and other special circumstances. Many of these projects were identified prior to drawing the sample. However, others were identified later during data collection. Depending on the circumstance of those identified during data collection, sampling decisions were made to either replace the project, subselect the project, or to make adjustments during weighting. The use of replacement for out-of-scope projects complicated the sample weight calculations. The determination of an actual probability of selection for these replacements was impossible to make. A sampling weight that is proportional to what the probability would have been had the project been selected originally was used as a reasonable estimate.

Population Totals. For study years FY 2005 through FY 2010, the same population counts were used to create the weights. In FY 2011 and again in FY 2012, the population totals were updated based on the FY 2011 frame, and then based on the FY 2012 frame, to more accurately reflect the current population. The use of the same population counts from year to year has had the advantage of increasing comparability of gross dollar estimates; any change from year to year would not have been due to a change in the number of households in the program, but to an actual change in the average gross dollar error or percentage of households. However, programs

may grow or shrink over time. While estimates of averages and percentages within program types would not be affected by different, updated population counts, the total dollar amounts and the proportion of the population represented by each program type *would not be representative of the current population if population counts were not updated*.

In addition, due to the inclusion of the Moving to Work (MTW) PHAs in FY 2012, the nature of the population itself has changed. Because the FY 2011 population totals and sample did not include the MTW population, using them to produce FY 2012 draft weighted tables would exclude the MTW population from the analysis and estimates without excluding them from the sample. Comparing the FY 2012 draft analysis tables using FY 2012 population totals with FY 2012 draft analysis tables using FY 2011 population totals would not accurately reflect the impact on the total gross dollar rent error estimate associated with the change in population totals.

The table below provides the population totals by program type for the FY 2011 and FY 2012 studies. Of the 384,036 additional units served by these programs in FY 2012, 377, 213 were a result of the addition of the MTW program in the sample frame.

Administration Type	FY 2011 Population	FY 2012 Population	Population Change FY 2012–FY 2011
Public Housing—non-MTW	1,052,503	1,040,708	-11,795
Public Housing—MTW	0	114,088	114,088
PHA-Admin. Section 8—non-MTW	1,912,467	1,935,597	23,130
PHA-Admin. Section 8—MTW	0	263,125	263,125
Owner-Administered	1,382,670	1,378,158	-4,512
Total	**4,347,640**	**4,731,676**	**384,036**

Weighting Methodology. The procedure to determine the final weights involved several steps, including: calculating the project weight (w_1); calculating the household weight (w_3); accounting for ineligible households (f_e); accounting for nonresponding households (f_n); poststratifying (f_p); and, finally, trimming the weights.

Calculating the Project Weight (w_1). The first step to determine the final weights was calculating the project weight by compiling the sampling probabilities calculated during the cluster and project sampling and the initial data collection process. These probabilities were then used to calculate each project's probability of selection. The probability of selection of a project was the product of the following:

1) The probability of selection of the cluster (p_1)

2) The probability of selection of the subcluster if the cluster was divided (p_2)

3) The probability of selection of the project from its respective cluster (p_3)

Each cluster was sampled with probabilities proportional to size. The measure of size used was the number of households adjusted to obtain equal expectation for the three major types of

programs in the study. The number of households of each program in a cluster was multiplied by an inflation factor to make all three numbers equal. The probability of selection of the cluster (p_1) was calculated in three steps. First, the proportion of the households in each of the three programs in a particular cluster was obtained. These proportions were defined as the number of households in each program within a cluster, divided by the number nationwide (program's population count). The three proportions in each cluster were then averaged and finally multiplied by 60, the number of clusters to be selected nationwide.

In some instances, clusters were geographically too large to collect data in a cost-effective manner. To accommodate this logistical problem clusters were divided into two or more subclusters or smaller geographic areas. A subcluster was then sampled from the group of subclusters using probabilities proportional to size. This resulted in the same probability that would have ensued had the division taken place before drawing the sample, or the probability of selection of the subcluster (p_2). If the cluster was not divided into smaller clusters, then the subcluster probability of selection was one. The formula to calculate the project weight was:

$$\left(w_1 = \frac{1}{minimum[p_1, 1] \times minimum[p_2, 1] \times minimum[p_3, 1]}\right)$$

Clusters with probabilities greater than one could have been selected more than once (Sampling with Minimal Replacement). These clusters were certainty clusters in that their selection into the sample was guaranteed. For the purposes of calculating the project weight, the certainty clusters' probability of selection was set to one.

The probability of selection of a project from its respective cluster (p_3) was calculated in two steps. First, the number of households in a program type within a project was divided by the total number of households in a program type within the project's cluster. This proportion was then multiplied by the number of projects in a program type to be selected from the cluster. The PHA-administered Section 8 projects could have had a probability greater than one for sampling purposes (meaning they could be sampled more than once). However, for the other two major program types, if the calculated probability exceeded one, it was set to one and all the other probabilities were readjusted so that they added to the allocation for the program in the cluster. For weighting purposes, probabilities greater than one among PHA-administered Section 8 projects were set to one.

Calculating the Household Weight (w_3). The second step to determine the final weights was to calculate the household weight. To calculate the household weight, the number of households in the project (N_p) and the number of households sampled from the project (n_p) were identified. The household probability of selection within the sampled project was the number of sampled households divided by the number of households in the project (p_4).

$$\left(p_4 = \left(\frac{n_p}{N_p}\right)\right)$$

The household within project weight (w_2) was the inverse of the probability of selecting the household within the sampled project:

$$\left(w_2 = \frac{1}{p_4}\right)$$

The household base weight (w_3) was the product of the project weight and the household within project weight:

$$(w_3 = w_1 \times w_2)$$

Account for Ineligible Households (f_e). The third step in the weighting process was to account for ineligible households within the sampled project. To do this the number of eligible sampled households $\left(n_{p_e}\right)$ out of all the households sampled was needed. Then the ratio of eligible household over sampled households, or the eligibility factor, was calculated (f_e):

$$f_e = \frac{n_{p_e}}{n_p}$$

The eligibility-adjusted household weight (w_4) was the household base weight multiplied by the eligibility factor:

$$(w_4 = w_3 \times f_e)$$

Account for Nonresponding Households (f_n). The fourth step in the weighting process was to account for nonresponding households within the sampled project. To do this, the number of eligible households, the number of responding households (n_{pr}) and the eligibility adjusted household weight was needed. The sum of the eligibility adjusted household weights for all eligible households in the project and the sum of eligibility adjusted household weights for only the responding households in a project was then calculated. A nonresponse adjustment factor (f_n) was calculated as:

$$f_n = \frac{\sum_{n_{p_e}} w_4}{\sum_{n_{pr}} w_4}$$

The nonresponse, adjusted household weight (w_5) was the eligibility-adjusted household weight multiplied by the nonresponse adjustment factor:

$$(w_5 = w_4 \times f_n)$$

Poststratification (f_p). The fifth step in the weighting process was poststratification. The sample was designed to obtain similar numbers of households in each of the following three program types:

1. Public Housing projects
2. PHA-administered Section 8 projects
3. Owner-administered projects

Population totals for each of the programs were obtained from the FY 2012 sampling frame. However, the sampling frame totals did not correspond exactly to these population totals and required adjustments. The weights were adjusted to sum to the known external population totals, so the sum of the weights would have been the same had a different sample been selected. In the past, this was due partially to special circumstances. Examples of special circumstances that have occurred in the past include the exclusion of geographic areas affected by the 2005 hurricanes and the Owner-administered projects from Alaska excluded from the frame, but included during the weighting process. In FY 2012, Alaska was included in the frame but was not selected.

To poststratify the weights, the nonresponse adjusted household weights within program type were summed to estimate the population totals from the HUD sample. For example, the sum of weights for all Owner-administered households in the sample is an estimate of the total number of Owner-administered households in the nation. A poststratification factor (f_p) was calculated by dividing the known external population totals ($N_{program\ type}$) by the estimated population totals from the HUD sample ($\sum_{program\ type} w_5$):

$$f_p = \frac{N_{program\ type}}{\sum_{program\ type} w_5}$$

A poststratification factor was calculated for each program type. This factor was then multiplied to the household weight within each program type, insuring the sum of the household weights by program type is the same as the external population totals.

Trimming the Weights. The final step was the trimming of the weights. Weights more than three times the median weight were set to three times the median weight and all the weights were readjusted. Large weights usually resulted from incorrect frame information.

Effective Sample Size Due to Weighting. In FY 2012, the weights led to an effective sample size (because of the weighting) of 768 (down from an actual size of 801) for the Owner-administered projects, 756 for the Public Housing projects (down from 803), and 754 for the PHA-administered Section 8 projects (down from 800). The effective sample size is the size of a random sample which would yield confidence intervals of the same size as the current sample. The effective sample size will often be smaller than the actual sample, partly because of clustering and partly because of weighting.

Variance Estimation. Standard errors were obtained for a number of estimates using a delete-a-group Jackknife procedure. This was implemented using 20 replicate groups and creating 20 sets of replicate weights. This procedure is available starting with SAS 9.2 and is considered more robust with respect to design characteristics than the Taylor Series method (Kott, 1998).

Top 20 PHA Weighting. As in previous studies, the data for the 20 largest PHAs sample was not weighted. The sample is approximately a self-weighting sample. The term *self-weighting* refers to a sample where all units being sampled (in this case, households) have the same weight, assuming that the frame is accurate and a 100 percent response is achieved.

A self-weighting sample has several advantages, including:

- Permitting more precise estimates for the 20 largest PHAs. To the extent that the sample departs from equal weights, the design effect will increase, causing correspondingly less precise estimates.
- Permitting unweighted modeling involving the 20 largest PHAs. Such models are less expensive to produce and the results allow a more straightforward interpretation.
- Facilitating reporting, because unweighted means and proportions for the sample will be estimates of the same means and proportions for the population, and the reporting of both a weighted and an unweighted mean will not confuse the reader.

Reference

Kott, P. S. (1998). Using the Delete-a-Group Jacknife Variance Estimator in Practice. *Proceedings of the Annual Meeting of the American Statistical Association, Section on Survey Research Methods* (pp. 763–768). Alexandria, VA: American Statistical Association.

Appendix C: MTW Population and Error Estimates

APPENDIX C: MTW POPULATION AND ERROR ESTIMATES

For the FY 2012 study, ICF determined the population counts for each program to enable the compilation of weights. ICF conducted analysis to determine the impact of the change in the population totals due to the inclusion of the Moving to Work (MTW) population in FY 2012 on error estimates in the HUDQC Study and Income Match Study.

Summary

1. For the HUDQC Study the changes in the gross error and average error estimates from FY 2011 to FY 2012 were due to the inclusion of the MTW program in the study and the sampling variance.
2. For the Income Match Study the changes in the gross error and average error estimates from FY 2011 to FY 2012 for the Public Housing program were changes that cannot be explained solely by the inclusion of the MTW program in the study and the sampling variance. For the PHA-Administered Section 8 program the changes were due to the inclusion of the MTW program in the study and the sampling variance.

Change in Population Totals Due to the Inclusion of the MTW Population

For FY 2012, HUD requested that MTW PHAs be included in the sampling frame for the QC and Income Match Studies. The request was a change from all previous QC and Income Match Studies in which HUD explicitly requested the removal of all MTW PHAs from the frame. The inclusion of the MTW PHAs resulted in an increase in the population totals. In addition, there were slight changes in the population totals, net the MTW population.

The table below provides the population totals by program type for the FY 2011 and FY 2012 studies. Of the 384,036 additional units served by these programs in FY 2012, 377,213 were a result of the addition of the MTW program in the sample frame.

Exhibit C-1: Change in Population Totals Over Time

Administration Type	FY 2005 to FY 2010 Population Totals[1]	FY 2011 Population Totals	FY 2012 Population Totals	Percent Increase in Population Totals from FY 2011 to FY 2012
Public Housing Total	955,000	1,052,503	1,154,796	+9.72%
Public Housing (non-MTW)	955,000	1,052,503	1,040,708	-1.12%
Public Housing (MTW)	0	0	114,088	
PHA-Admin. Section 8 Total	1,858,000	1,912,467	2,198,722	+14.97%
PHA-Admin. Section 8 (non-MTW)	1,858,000	1,912,467	1,935,597	+1.21%
PHA-Admin. Section 8 (MTW)	0	0	263,125	
Owner-Administered	1,320,000	1,382,670	1,378,158	-0.33%
Total	**4,133,000**	**4,347,640**	**4,731,676**	+8.83%

[1]Population totals were obtained from the statement of work for the 2005 RFP.

Impact of the Inclusion of the MTW Population on Error Estimates in the HUDQC and Income Match Studies

In order to determine the impact of the inclusion of the MTW population, ICF calculated error estimates for FY 2012 for both the non-MTW and the MTW population. ICF then conducted statistical tests comparing error for the FY 2012 non-MTW population to the FY 2011 population, which did not include MTW. This comparison was done for both the overall gross error estimate and for the program level gross error estimates.

When comparing the FY 2012 non-MTW population to the FY 2011 population, which did not include MTW, the results of the tests showed the following:

- For the QC Study, there was no statistically significant difference in total gross dollar error for both the overall estimate and for the program level estimates.
- For the QC Study, there was no statistically significant difference in average gross dollar error for both the overall estimate and for the program level estimates.
- For the Income Match study, the difference in total gross dollar error was only statistically significant for the Public Housing program.
- For the Income Match study, the difference in average gross dollar error was only statistically significant for the Public Housing program.

Based on these statistical tests, ICF can conclude that for the QC study the change in the total and average gross dollar estimates were due to an increase in the population totals due to the inclusion of the MTW population. Any other variance can be attributed to the fact that estimates can fluctuate from year to year based on the sample selected. Estimates should be considered in conjunction with their 95% confidence intervals.

For the Income Match Study, however, the entirety of the change for the Public Housing program could not be solely attributed to sampling variance. The Income Match Study estimates are reliant on a small number of cases in error and can fluctuate greatly from year to year. The HUDQC sample was not designed to produce the Income Match Study estimates with the same level of precision as the QC study. In order to achieve the same level of precision for the Income Match estimates, the HUDQC sample would have to increase considerably.

In addition, because the sample was not designed to provide estimates at the MTW level, the estimates for MTW may not be sufficiently robust. The sample may be too small and should not be assumed to meet the precision requirements of the RFP.

The results of the statistical tests are summarized in the tables below for both the QC Study and the Income Match Study. There were no statistically significant differences for the QC Study. For the Income Match Study the only statistically significant difference was for the Public Housing program for both gross rent error and average rent error.

Exhibit C-2: Total Gross Rent Error: QC and Income Match Study FY 2011 and FY 2012 (non-MTW)

Total Gross Rent Dollars in Error				
Administration Type	**2011[1]**	**95% Confidence Interval**	**2012[2] (non-MTW)**	**95% Confidence Interval**
QC Study				
Public Housing	$139,885,423	±$40,739,573	$182,850,964	±$59,721,979
PHA-Administered Section 8	$436,155,531	±$99,234,601	$391,808,888	±$108,985,444
Owner-Administered	$119,168,035	±$43,758,418	$177,234,106	±$61,458,635
QC Study Total	**$695,208,989**	**±$108,727,689**	**$751,893,958**	**±$152,516,336**
Income Match Study				
Public Housing	$78,621,422	±$50,494,615	$195,542,066*	±$111,353,021
PHA-Administered Section 8	$265,695,668	±$129,281,809	$158,514,981	±$100,060,759
Owner-Administered	$84,174,531	±$75,991,304	$46,712,918	±$34,454,319
Income Match Study Total	**$428,491,621**	**±$142,965,491**	**$400,769,965**	**±$163,036,844**

Note: *Difference from FY 2011 at significance p<0.05
[1]The 2011 population totals and sample excluded MTW
[2]The 2012 population totals and sample included MTW

Exhibit C-3: Average (Monthly) Gross Rent Error for All Households: QC and Income Match Study FY 2011 and FY 2012 (Non-MTW)

Average Rent Dollars in Error (Monthly)				
Administration Type	**2011[1]**	**95% Confidence Interval**	**2012[2] (non-MTW)**	**95% Confidence Interval**
QC Study				
Public Housing	$11	±$3	$15	±$5
PHA-Administered Section 8	$19	±$4	$17	±$5
Owner-Administered	$7	±$3	$11	±$4
QC Study Total	**$13**	**±$2**	**$14**	**±$3**
Income Match Study				
Public Housing	$75	±$48	$191*	±$111
PHA-Administered Section 8	$139	±$68	$81	±$51
Owner-Administered	$61	±$55	$34	±$25
Income Match Study Total	**$99**	**±$33**	**$92**	**±$39**

Note: * Difference from FY 2011 at significance p<0.05
[1]The 2011 population totals and sample excluded MTW
[2]The 2012 population totals and sample included MTW

Technical Notes

- When comparing populations from year to year, it is not appropriate to use the FY 2012 population totals excluding the MTW population while including MTW in the sample. For the same reason, it is not appropriate to produce FY 2012 estimates using FY 2011 population totals. The FY 2012 sample, which includes MTW, would not represent the FY 2011 population, which excludes MTW. Any comparison of two samples in order to determine whether there are significant differences between two estimates requires that the samples represent the same populations. This is particularly important if the sample represents two different years and the comparison is meant to determine whether a meaningful change has taken place.

- In order to produce estimates for the non-MTW and MTW populations separately for FY 2012, the non-MTW sample can be treated as a domain, sufficiently large that one can obtain estimates from that domain for purposes of comparing with the 2011 sample. The 2012 non-MTW sub-sample is smaller, but the weights add to a comparable population because the average weight is larger. Note that the estimates for the MTW domain may not be sufficiently robust, because the MTW sample may be too small and should not be assumed to meet the HUDQC sampling precision requirements.

- The comparison of total gross dollar error does not account for changes in the population net the MTW population. While the population excluding MTW did change slightly from FY 2011 to FY 2012, these changes were small in nature. When comparing dollar error from year to year, average dollar error is the best estimate for comparison because it is not impacted by changes in population size.

- Statistical tests not separating out MTW for the QC study showed that for the QC study, the differences in total and average gross dollar error were already not significant, implying that separating out MTW would not change these results, which proved to be correct. For the Income Match Study, statistical tests not separating out MTW showed that the change in the Public Housing estimate was statistically significant. Separating out the MTW population confirmed this finding as well.

The results of the statistical tests including the total FY 2012 estimates and the FY 2012 MTW domain estimates are summarized in the tables below for both the QC Study and the Income Match Study.

Exhibit C-4: Total Gross Rent Error: QC and Income Match Study
Comparison of FY 2011, FY 2012, FY 2012 (non-MTW) and FY 2012 (MTW)

Total Gross Rent Dollars in Error								
Administration Type	2011[1]	95% Confidence Interval	2012[2]	95% Confidence Interval	2012[2] (non-MTW)	95% Confidence Interval	2012[2] (MTW)	95% Confidence Interval
QC Study								
Public Housing	$139,885,423	±$40,739,573	$190,849,325	±$60,873,592	$182,850,964	±$59,721,979	$7,998,361	±$9,279,582
PHA-Administered Section 8	$436,155,531	±$99,234,601	$430,716,254	±$107,114,648	$391,808,888	±$108,985,444	$38,907,366	±$34,341,788
Owner-Administered	$119,168,035	±$43,758,418	$177,234,106	±$61,458,635	$177,234,106	±$61,458,635		
QC Study Total	**$695,208,989**	**±$108,727,689**	**$798,799,685**	**±$148,415,259**	**$751,893,958**	**±$152,516,336**	**$46,905,727**	**±$37,582,150**
Income Match Study								
Public Housing	$78,621,422	±$50,494,615	$203,685,292*	±$113,852,186	$195,542,066*	±$111,353,021	$8,143,226	±$10,331,519
PHA-Administered Section 8	$265,695,668	±$129,281,809	$168,802,108	±$99,292,046	$158,514,981	±$100,060,759	$10,287,127	±$20,859,937
Owner-Administered	$84,174,531	±$75,991,304	$46,712,918	±$34,454,319	$46,712,918	±$34,454,319		
Income Match Study Total	**$428,491,621**	**±$142,965,491**	**$419,200,318**	**±$165,316,295**	**$400,769,965**	**±$163,036,844**	**$18,430,353**	**±$30,004,057**

Note: * Difference from FY 2011 at significance p<0.05
[1]The 2011 population totals and sample excluded MTW
[2]The 2012 population totals and sample included MTW

Exhibit C-5: Average (Monthly) Gross Rent Error for All Households: QC and Income Match Study Comparison of FY 2011, FY 2012, FY 2012 (non-MTW) and FY 2012 (MTW)

Average Rent Dollars in Error (Monthly)								
Administration Type	2011[1]	95% Confidence Interval	2012[2]	95% Confidence Interval	2012[2] (non-MTW)	95% Confidence Interval	2012[2] (MTW)	95% Confidence Interval
QC Study								
Public Housing	$11	±$3	$14	±$4	$15	±$5	$5	±$6
PHA-Administered Section 8	$19	±$4	$16	±$4	$17	±$5	$14	±$8
Owner-Administered	$7	±$3	$11	±$4	$11	±$4		
QC Study Total	**$13**	**±$2**	**$14**	**±$3**	**$14**	**±$3**	**$11**	**±$5**
Income Match Study								
Public Housing	$75	±$48	$176*	±$99	$191*	±$111	$62	±$82
PHA-Administered Section 8	$139	±$68	$77	±$45	$81	±$51	$44	±$101
Owner-Administered	$61	±$55	$34	±$25	$34	±$25		
Income Match Study Total	**$99**	**±$33**	**$89**	**±$35**	**$92**	**±$39**	**$51**	**±$90**

Note: * Difference from FY 2011 at significance p<0.05
[1]The 2011 population totals and sample excluded MTW
[2]The 2012 population totals and sample included MTW

Appendix D: Source Tables

Source Tables Based on Quality Control Data

HUD QC FY 2012
Table 1a. Verification of QC Rent Components
Third-Party Verbal or in Writing, Documentation, or EIV/UIV

Rent Component	Not Verified		Partially Verified		Fully Verified	
	# of Cases (in 1,000)	Row % of Cases	# of Cases (in 1,000)	Row % of Cases	# of Cases (in 1,000)	Row % of Cases
Earned Income	30	(2.1%)	29	(2.0%)	1,389	(95.9%)
Pension, Etc.	3	(0.1%)	17	(0.6%)	2,795	(99.3%)
Public Assistance	1	(0.3%)			445	(99.7%)
Other Income	48	(5.3%)	20	(2.2%)	841	(92.5%)
Asset Income			12	(2.2%)	512	(97.8%)
Child Care Expense	6	(2.9%)			199	(97.1%)
Disability Expense					3	(100.0%)
Medical Expense	5	(0.4%)	8	(0.6%)	1,293	(98.9%)

2013.9.17 [Weighted]

HUD QC FY 2012
Table 1b. Verification of QC Rent Components
Third Party in Writing

Rent Component	Not Verified		Partially Verified		Fully Verified	
	# of Cases (in 1,000)	Row % of Cases	# of Cases (in 1,000)	Row % of Cases	# of Cases (in 1,000)	Row % of Cases
Earned Income	786	(52.3%)	69	(4.6%)	646	(43.0%)
Pension, Etc.	303	(10.7%)	445	(15.8%)	2,074	(73.5%)
Public Assistance	384	(74.3%)	10	(1.9%)	123	(23.8%)
Other Income	731	(69.5%)	38	(3.7%)	282	(26.8%)
Asset Income	151	(28.7%)	116	(22.1%)	259	(49.2%)
Child Care Expense	80	(39.0%)	4	(2.2%)	121	(58.8%)
Disability Expense					3	(100.0%)
Medical Expense	340	(26.0%)	403	(30.9%)	564	(43.1%)

2013.9.17 [Weighted]

HUD QC FY 2012
Table 1c. Verification of QC Rent Components
Third Party in Writing or EIV/UIV

Rent Component	Not Verified		Partially Verified		Fully Verified	
	# of Cases (in 1,000)	Row % of Cases	# of Cases (in 1,000)	Row % of Cases	# of Cases (in 1,000)	Row % of Cases
Earned Income	682	(45.4%)	74	(4.9%)	746	(49.7%)
Pension, Etc.	114	(4.0%)	263	(9.3%)	2,445	(86.6%)
Public Assistance	247	(47.7%)	5	(1.1%)	265	(51.2%)
Other Income	542	(51.5%)	40	(3.8%)	471	(44.7%)
Asset Income	146	(27.7%)	116	(22.1%)	264	(50.2%)
Child Care Expense	78	(38.2%)	4	(2.2%)	122	(59.6%)
Disability Expense					3	(100.0%)
Medical Expense	281	(21.5%)	383	(29.3%)	643	(49.2%)

2013.9.17 [Weighted]

HUD QC FY 2012
Table 1d. Verification of QC Rent Components
Third Party Verbal

Rent Component	Not Verified		Partially Verified		Fully Verified	
	# of Cases (in 1,000)	Row % of Cases	# of Cases (in 1,000)	Row % of Cases	# of Cases (in 1,000)	Row % of Cases
Earned Income	1,492	(99.4%)	4	(0.3%)	5	(0.4%)
Pension, Etc.	2,818	(99.9%)	4	(0.1%)		
Public Assistance	515	(99.7%)			2	(0.3%)
Other Income	1,042	(99.1%)	1	(0.1%)	8	(0.8%)
Asset Income	526	(100.0%)				
Child Care Expense	204	(99.3%)			1	(0.7%)
Disability Expense	3	(100.0%)				
Medical Expense	1,299	(99.4%)	6	(0.5%)	2	(0.1%)

2013.9.17 [Weighted]

HUD QC FY 2012
Table 1e. Verification of QC Rent Components
Documentation

Rent Component	Not Verified		Partially Verified		Fully Verified	
	# of Cases (in 1,000)	Row % of Cases	# of Cases (in 1,000)	Row % of Cases	# of Cases (in 1,000)	Row % of Cases
Earned Income	853	(56.8%)	69	(4.6%)	580	(38.6%)
Pension, Etc.	2,474	(87.7%)	243	(8.6%)	105	(3.7%)
Public Assistance	337	(65.3%)	5	(1.1%)	174	(33.6%)
Other Income	688	(65.4%)	24	(2.3%)	340	(32.3%)
Asset Income	274	(52.1%)	110	(21.0%)	142	(27.0%)
Child Care Expense	129	(63.2%)	4	(2.2%)	71	(34.6%)
Disability Expense	3	(100.0%)				
Medical Expense	654	(50.0%)	379	(29.0%)	274	(20.9%)

2013.9.17 [Weighted]

HUD QC FY 2012
Table 1f. Verification of QC Rent Components
EIV (Enterprise Income Verification)

Rent Component	Not Verified		Partially Verified		Fully Verified	
	# of Cases (in 1,000)	Row % of Cases	# of Cases (in 1,000)	Row % of Cases	# of Cases (in 1,000)	Row % of Cases
Earned Income	1,495	(99.6%)	5	(0.3%)	1	(0.1%)
Pension, Etc.	2,485	(88.1%)	170	(6.0%)	167	(5.9%)
Public Assistance	517	(100.0%)				
Other Income	1,050	(99.8%)			2	(0.2%)
Asset Income	526	(100.0%)				
Child Care Expense	205	(100.0%)				
Disability Expense	3	(100.0%)				
Medical Expense	1,213	(92.8%)	60	(4.6%)	34	(2.6%)

2013.9.17 [Weighted]

HUD QC FY 2012
Table 1g. Verification of QC Rent Components
UIV (Upfront Income Verification)

Rent Component	Not Verified		Partially Verified		Fully Verified	
	# of Cases (in 1,000)	Row % of Cases	# of Cases (in 1,000)	Row % of Cases	# of Cases (in 1,000)	Row % of Cases
Earned Income	1,342	(92.6%)	17	(1.2%)	90	(6.2%)
Pension, Etc.	2,755	(97.9%)	52	(1.8%)	9	(0.3%)
Public Assistance	305	(68.3%)	4	(1.0%)	137	(30.8%)
Other Income	711	(78.2%)	21	(2.3%)	178	(19.5%)
Asset Income					10	(100.0%)
Child Care Expense					2	(100.0%)
Medical Expense					27	(100.0%)

2013.9.17 [Weighted]

HUD QC FY 2012
Table 2. Percent of Households by Payment Type and Program Type

Program Type		Underpayment			Proper Payment			Overpayment			Total		
		# of Cases (in 1,000)	Row % of Cases	Col. % of Cases	# of Cases (in 1,000)	Row % of Cases	Col. % of Cases	# of Cases (in 1,000)	Row % of Cases	Col. % of Cases	# of Cases (in 1,000)	Row % of Cases	Col. % of Cases
PHA-Administered	Public Housing	144	(12.5%)	(19.7%)	861	(74.6%)	(25.2%)	150	(13.0%)	(25.6%)	1,155	(100.0%)	(24.4%)
	Section 8	364	(16.6%)	(49.8%)	1,527	(69.5%)	(44.7%)	307	(14.0%)	(52.5%)	2,199	(100.0%)	(46.5%)
	Total	508	(15.1%)	(69.4%)	2,389	(71.2%)	(69.9%)	457	(13.6%)	(78.1%)	3,354	(100.0%)	(70.9%)
Owner-Administered	Owner-Administered	224	(16.2%)	(30.6%)	1,027	(74.5%)	(30.1%)	128	(9.3%)	(21.9%)	1,378	(100.0%)	(29.1%)
	Total	224	(16.2%)	(30.6%)	1,027	(74.5%)	(30.1%)	128	(9.3%)	(21.9%)	1,378	(100.0%)	(29.1%)
Total		731	(15.5%)	(100.0%)	3,415	(72.2%)	(100.0%)	585	(12.4%)	(100.0%)	4,732	(100.0%)	(100.0%)

2013.9.17 [Weighted]

HUD QC FY 2012
Table 2(S). Percent of Households by Payment Type and Program Type
(Proper Payment Based on Exact Match of Actual and QC Rent)

Program Type		Payment Type									Total		
		Underpayment			Proper Payment			Overpayment					
		# of Cases (in 1,000)	Row % of Cases	Col. % of Cases	# of Cases (in 1,000)	Row % of Cases	Col. % of Cases	# of Cases (in 1,000)	Row % of Cases	Col. % of Cases	# of Cases (in 1,000)	Row % of Cases	Col. % of Cases
PHA-Administered	Public Housing	185	(16.0%)	(18.6%)	691	(59.8%)	(25.7%)	279	(24.2%)	(26.7%)	1,155	(100.0%)	(24.4%)
	Section 8	479	(21.8%)	(48.1%)	1,160	(52.8%)	(43.1%)	560	(25.5%)	(53.4%)	2,199	(100.0%)	(46.5%)
	Total	663	(19.8%)	(66.7%)	1,851	(55.2%)	(68.8%)	839	(25.0%)	(80.1%)	3,354	(100.0%)	(70.9%)
Owner-Administered	Owner-Administered	331	(24.0%)	(33.3%)	839	(60.9%)	(31.2%)	208	(15.1%)	(19.9%)	1,378	(100.0%)	(29.1%)
	Total	331	(24.0%)	(33.3%)	839	(60.9%)	(31.2%)	208	(15.1%)	(19.9%)	1,378	(100.0%)	(29.1%)
Total		994	(21.0%)	(100.0%)	2,690	(56.8%)	(100.0%)	1,048	(22.1%)	(100.0%)	4,732	(100.0%)	(100.0%)

2013.9.17 [Weighted]

HUD QC FY 2012
Table 3. Dollar Rent Error by Program Type

Program Type		Actual Rent (Monthly)				QC Rent (Monthly)				Gross Rent Error (Monthly)			
		# of Cases (in 1,000)	Col. % of Cases	Sum Dollar Amount (in 1,000)	Avg. Dollar Amount	# of Cases (in 1,000)	Col. % of Cases	Sum Dollar Amount (in 1,000)	Avg. Dollar Amount	# of Cases (in 1,000)	Col. % of Cases	Sum Dollar Amount (in 1,000)	Avg. Dollar Amount
PHA-Administered	Public Housing	1,155	(24.4%)	271,879	235.43	1,155	(24.4%)	275,483	238.56	1,155	(24.4%)	15,904	13.77
	Section 8	2,199	(46.5%)	482,680	219.53	2,199	(46.5%)	492,167	223.84	2,199	(46.5%)	35,893	16.32
	Total	3,354	(70.9%)	754,559	225.01	3,354	(70.9%)	767,650	228.91	3,354	(70.9%)	51,797	15.45
Owner-Administered	Owner-Administered	1,378	(29.1%)	299,414	217.26	1,378	(29.1%)	306,591	222.46	1,378	(29.1%)	14,770	10.72
	Total	1,378	(29.1%)	299,414	217.26	1,378	(29.1%)	306,591	222.46	1,378	(29.1%)	14,770	10.72
Total		4,732	(100.0%)	1,053,973	222.75	4,732	(100.0%)	1,074,241	227.03	4,732	(100.0%)	66,567	14.07

2013.9.17 [Weighted]

HUD QC FY 2012
Table 4. Dollar Error Amount by Payment Type and Program Type

Program Type		Underpayment (Monthly)				Overpayment (Monthly)				QC Rent (Monthly)			
		# of Cases (in 1,000)	Col. % of Cases	Sum Dollar Amount (in 1,000)	Avg. Dollar Amount	# of Cases (in 1,000)	Col. % of Cases	Sum Dollar Amount (in 1,000)	Avg. Dollar Amount	# of Cases (in 1,000)	Col. % of Cases	Sum Dollar Amount (in 1,000)	Avg. Dollar Amount
PHA-Administered	Public Housing	144	(19.7%)	9,837	68.42	150	(25.6%)	6,067	40.54	1,155	(24.4%)	275,483	238.56
	Section 8	364	(49.8%)	22,743	62.48	307	(52.5%)	13,150	42.80	2,199	(46.5%)	492,167	223.84
	Total	508	(69.4%)	32,580	64.16	457	(78.1%)	19,217	42.06	3,354	(70.9%)	767,650	228.91
Owner-Administered	Owner-Administered	224	(30.6%)	10,960	48.99	128	(21.9%)	3,809	29.80	1,378	(29.1%)	306,591	222.46
	Total	224	(30.6%)	10,960	48.99	128	(21.9%)	3,809	29.80	1,378	(29.1%)	306,591	222.46
Total		731	(100.0%)	43,541	59.52	585	(100.0%)	23,026	39.38	4,732	(100.0%)	1,074,241	227.03

2013.9.17 [Weighted]

HUD QC FY 2012
Table 4(S). Dollar Error Amount by Payment Type and Program Type
(Proper Payment Based on Exact Match of Actual and QC Rent)

Program Type		Underpayment (Monthly)				Overpayment (Monthly)				QC Rent (Monthly)			
		# of Cases (in 1,000)	Col. % of Cases	Sum Dollar Amount (in 1,000)	Avg. Dollar Amount	# of Cases (in 1,000)	Col. % of Cases	Sum Dollar Amount (in 1,000)	Avg. Dollar Amount	# of Cases (in 1,000)	Col. % of Cases	Sum Dollar Amount (in 1,000)	Avg. Dollar Amount
PHA-Administered	Public Housing	185	(18.6%)	9,906	53.62	279	(26.7%)	6,302	22.55	1,155	(24.4%)	275,483	238.56
	Section 8	479	(48.1%)	23,016	48.10	560	(53.4%)	13,529	24.16	2,199	(46.5%)	492,167	223.84
	Total	663	(66.7%)	32,922	49.64	839	(80.1%)	19,831	23.63	3,354	(70.9%)	767,650	228.91
Owner-Administered	Owner-Administered	331	(33.3%)	11,171	33.73	208	(19.9%)	3,994	19.18	1,378	(29.1%)	306,591	222.46
	Total	331	(33.3%)	11,171	33.73	208	(19.9%)	3,994	19.18	1,378	(29.1%)	306,591	222.46
Total		994	(100.0%)	44,093	44.34	1,048	(100.0%)	23,825	22.74	4,732	(100.0%)	1,074,241	227.03

2013.9.17 [Weighted]

HUD QC FY 2012
Table 5. Gross and Net Rent Error by Program Type

Program Type		Gross Rent Error (Monthly)				Net Rent Error (Monthly)				QC Rent (Monthly)			
		# of Cases (in 1,000)	Col. % of Cases	Sum Dollar Amount (in 1,000)	Avg. Dollar Amount	# of Cases (in 1,000)	Col. % of Cases	Sum Dollar Amount (in 1,000)	Avg. Dollar Amount	# of Cases (in 1,000)	Col. % of Cases	Sum Dollar Amount (in 1,000)	Avg. Dollar Amount
PHA-Administered	Public Housing	1,155	(24.4%)	15,904	13.77	1,155	(24.4%)	-3,771	-3.27	1,155	(24.4%)	275,483	238.56
	Section 8	2,199	(46.5%)	35,893	16.32	2,199	(46.5%)	-9,593	-4.36	2,199	(46.5%)	492,167	223.84
	Total	3,354	(70.9%)	51,797	15.45	3,354	(70.9%)	-13,363	-3.98	3,354	(70.9%)	767,650	228.91
Owner-Administered	Owner-Administered	1,378	(29.1%)	14,770	10.72	1,378	(29.1%)	-7,151	-5.19	1,378	(29.1%)	306,591	222.46
	Total	1,378	(29.1%)	14,770	10.72	1,378	(29.1%)	-7,151	-5.19	1,378	(29.1%)	306,591	222.46
Total		4,732	(100.0%)	66,567	14.07	4,732	(100.0%)	-20,514	-4.34	4,732	(100.0%)	1,074,241	227.03

2013.9.17 [Weighted]

HUD QC FY 2012
Table 5(S). Gross and Net Rent Error by Program Type
(Proper Payment Based on Exact Match of Actual and QC Rent)

Program Type		Gross Rent Error (Monthly)				Net Rent Error (Monthly)				QC Rent (Monthly)			
		# of Cases (in 1,000)	Col. % of Cases	Sum Dollar Amount (in 1,000)	Avg. Dollar Amount	# of Cases (in 1,000)	Col. % of Cases	Sum Dollar Amount (in 1,000)	Avg. Dollar Amount	# of Cases (in 1,000)	Col. % of Cases	Sum Dollar Amount in 1,000)	Avg. Dollar Amount
PHA-Administered	Public Housing	1,155	(24.4%)	16,208	14.04	1,155	(24.4%)	-3,604	-3.12	1,155	(24.4%)	275,483	238.56
	Section 8	2,199	(46.5%)	36,545	16.62	2,199	(46.5%)	-9,487	-4.31	2,199	(46.5%)	492,167	223.84
	Total	3,354	(70.9%)	52,753	15.73	3,354	(70.9%)	-13,091	-3.90	3,354	(70.9%)	767,650	228.91
Owner-Administered	Owner-Administered	1,378	(29.1%)	15,165	11.00	1,378	(29.1%)	-7,177	-5.21	1,378	(29.1%)	306,591	222.46
	Total	1,378	(29.1%)	15,165	11.00	1,378	(29.1%)	-7,177	-5.21	1,378	(29.1%)	306,591	222.46
Total		4,732	(100.0%)	67,918	14.35	4,732	(100.0%)	-20,268	-4.28	4,732	(100.0%)	1,074,241	227.03

2013.9.17 [Weighted]

HUD QC FY 2012
Table 6. Case Type by Program Type

Program Type		Certifications			Recertifications/Non-Overdue			Recertifications/Overdue			Total		
		# of Cases (in 1,000)	Row % of Cases	Col. % of Cases	# of Cases (in 1,000)	Row % of Cases	Col. % of Cases	# of Cases (in 1,000)	Row % of Cases	Col. % of Cases	# of Cases (in 1,000)	Row % of Cases	Col. % of Cases
PHA-Administered	Public Housing	159	(13.7%)	(29.4%)	981	(85.0%)	(23.6%)	15	(1.3%)	(35.4%)	1,155	(100.0%)	(24.4%)
	Section 8	170	(7.7%)	(31.5%)	2,001	(91.0%)	(48.2%)	28	(1.3%)	(64.6%)	2,199	(100.0%)	(46.5%)
	Total	328	(9.8%)	(60.9%)	2,982	(88.9%)	(71.9%)	43	(1.3%)	(100.0%)	3,354	(100.0%)	(70.9%)
Owner-Administered	Owner-Administered	211	(15.3%)	(39.1%)	1,167	(84.7%)	(28.1%)				1,378	(100.0%)	(29.1%)
	Total	211	(15.3%)	(39.1%)	1,167	(84.7%)	(28.1%)				1,378	(100.0%)	(29.1%)
Total		540	(11.4%)	(100.0%)	4,149	(87.7%)	(100.0%)	43	(0.9%)	(100.0%)	4,732	(100.0%)	(100.0%)

2013.9.17 [Weighted]

HUD QC FY 2012
Table 7. Percent of Newly Certified Households Meeting Certification Criteria

Certification Criteria	Met Criterion		Did Not Meet Criterion	
	# of Cases (in 1,000)	% of Cases	# of Cases (in 1,000)	% of Cases
Citizenship	540	(100.0%)		
Social Security Number	533	(98.8%)	7	(1.2%)
Consent Form	514	(95.3%)	25	(4.7%)
Low and Very Low Income	540	(100.0%)		
Meets All Eligibility Criteria	512	(95.0%)	27	(5.0%)

2013.9.17 [Weighted]

HUD QC FY 2012

Table 7b. Percent of Newly Certified Households Meeting Certification Criteria by Program Type

Certification Criteria		Met Criterion		Did Not Meet Criterion	
		# of Cases (in 1,000)	% of Cases	# of Cases (in 1,000)	% of Cases
Public Housing	Citizenship	159	(100.0%)		
	Social Security Number	159	(100.0%)		
	Consent Form	150	(94.4%)	9	(5.6%)
	Low and Very Low Income	159	(100.0%)		
	Meets All Eligibility Criteria	150	(94.4%)	9	(5.6%)
PHA-Administered Section 8	Citizenship	170	(100.0%)		
	Social Security Number	167	(98.6%)	2	(1.4%)
	Consent Form	161	(94.6%)	9	(5.4%)
	Low and Very Low Income	170	(100.0%)		
	Meets All Eligibility Criteria	161	(94.6%)	9	(5.4%)
Owner-Administered	Citizenship	211	(100.0%)		
	Social Security Number	207	(98.0%)	4	(2.0%)
	Consent Form	204	(96.5%)	7	(3.5%)
	Low and Very Low Income	211	(100.0%)		
	Meets All Eligibility Criteria	202	(95.7%)	9	(4.3%)

2013.9.17 [Weighted]

HUD QC FY 2012
Table 8. Dollar Error Amount by Payment Type and Case Type

Case Type		Underpayment (Monthly)				Overpayment (Monthly)				QC Rent (Monthly)			
		# of Cases (in 1,000)	Col. % of Cases	Sum Dollar Amount (in 1,000)	Avg. Dollar Amount	# of Cases (in 1,000)	Col. % of Cases	Sum Dollar Amount (in 1,000)	Avg. Dollar Amount	# of Cases (in 1,000)	Col. % of Cases	Sum Dollar Amount (in 1,000)	Avg. Dollar Amount
Certification	Total	79	(10.8%)	4,239	53.67	63	(10.7%)	2,487	39.73	540	(11.4%)	93,405	173.09
Recertification	Non-Overdue	638	(87.2%)	37,652	59.06	506	(86.5%)	19,225	37.99	4,149	(87.7%)	968,939	233.53
	Overdue	15	(2.0%)	1,649	110.18	16	(2.8%)	1,314	81.39	43	(0.9%)	11,897	276.88
	Total	652	(89.2%)	39,301	60.23	522	(89.3%)	20,539	39.33	4,192	(88.6%)	980,836	233.98
Total		731	(100.0%)	43,541	59.52	585	(100.0%)	23,026	39.38	4,732	(100.0%)	1,074,241	227.03

2013.9.17 [Weighted]

HUD QC FY 2012
Table 8(S). Dollar Error Amount by Payment Type and Case Type
(Proper Payment Based on Exact Match of Actual and QC Rent)

Case Type		Underpayment (Monthly)				Overpayment (Monthly)				QC Rent (Monthly)			
		# of Cases (in 1,000)	Col. % of Cases	Sum Dollar Amount (in 1,000)	Avg. Dollar Amount	# of Cases (in 1,000)	Col. % of Cases	Sum Dollar Amount (in 1,000)	Avg. Dollar Amount	# of Cases (in 1,000)	Col. % of Cases	Sum Dollar Amount (in 1,000)	Avg. Dollar Amount
Certification	Total	116	(11.7%)	4,340	37.29	98	(9.4%)	2,536	25.85	540	(11.4%)	93,405	173.09
Recertification	Non-Overdue	861	(86.5%)	38,096	44.27	933	(89.1%)	19,975	21.40	4,149	(87.7%)	968,939	233.53
	Overdue	18	(1.8%)	1,657	94.66	16	(1.5%)	1,314	81.39	43	(0.9%)	11,897	276.88
	Total	878	(88.3%)	39,753	45.27	950	(90.6%)	21,289	22.42	4,192	(88.6%)	980,836	233.98
Total		994	(100.0%)	44,093	44.34	1,048	(100.0%)	23,825	22.74	4,732	(100.0%)	1,074,241	227.03

2013.9.17 [Weighted]

HUD QC FY 2012
TABLE 9. Largest Component Error for Households With Rent Error (Annual Dollars)

Rent Component	# of Cases (in 1,000)	Col. % of Cases	Sum Dollar Amount (in 1,000)	Avg. Dollar Amount
Earned Income	361	(27.5%)	1,673,555	4,632
Pension, Etc.	334	(25.4%)	617,552	1,846
Public Assistance	75	(5.7%)	202,836	2,706
Other Income	143	(10.9%)	515,528	3,599
Asset Income	21	(1.6%)	14,169	684
Dependent Allowance	78	(5.9%)	40,545	519
Elderly HH Allowance	37	(2.8%)	14,821	400
Child Care Allowance	25	(1.9%)	65,300	2,626
Disability Allowance	1	(0.1%)	6,757	4,528
Medical Allowance	202	(15.3%)	211,535	1,049
No Error	39	(2.9%)	0	0
Total	1,316	(100.0%)	3,362,598	2,555

2013.9.17 [Weighted]

HUD QC FY 2012
Table 10. Total and Largest Dollar Error by Program Type for Households With Rent Errors

Program Type		Total Dollar In Error				Largest Dollar Error			
		# of Cases (in 1,000)	Col. % of Cases	Sum Dollar Amount (in 1,000)	Avg. Dollar Amount	# of Cases (in 1,000)	Col. % of Cases	Sum Dollar Amount (in 1,000)	Avg. Dollar Amount
PHA-Administered	Public Housing	293	(22.3%)	1,090,180	3,715.25	293	(22.3%)	938,257	3,197.51
	Section 8	671	(51.0%)	2,197,283	3,273.37	671	(51.0%)	1,759,633	2,621.39
	Total	965	(73.3%)	3,287,463	3,407.78	965	(73.3%)	2,697,890	2,796.63
Owner-Administered	Owner-Administered	352	(26.7%)	765,470	2,177.38	352	(26.7%)	664,708	1,890.76
	Total	352	(26.7%)	765,470	2,177.38	352	(26.7%)	664,708	1,890.76
Total		1,316	(100.0%)	4,052,933	3,079.15	1,316	(100.0%)	3,362,598	2,554.68

2013.9.17 [Weighted]

HUD QC FY 2012
Table 11. QC Rent Components by Payment Type and Administration Type

Rent Component		PHA-Administered			Owner-Administered			Total		
		# of Cases (in 1,000)	Col. % of Cases	Row % of Cases	# of Cases (in 1,000)	Col. % of Cases	Row % of Cases	# of Cases (in 1,000)	Col. % of Cases	Row % of Cases
Underpayment	Earned Income	177	(5.3%)	(73.6%)	63	(4.6%)	(26.4%)	241	(5.1%)	(100.0%)
	Pension, Etc.	198	(5.9%)	(59.3%)	136	(9.8%)	(40.7%)	333	(7.0%)	(100.0%)
	Public Assistance	55	(1.6%)	(82.7%)	11	(0.8%)	(17.3%)	66	(1.4%)	(100.0%)
	Other Income	77	(2.3%)	(72.3%)	29	(2.1%)	(27.7%)	106	(2.2%)	(100.0%)
	Asset Income	28	(0.8%)	(42.5%)	37	(2.7%)	(57.5%)	65	(1.4%)	(100.0%)
	Dependent Allowance	49	(1.5%)	(94.4%)	3	(0.2%)	(5.6%)	52	(1.1%)	(100.0%)
	Elderly HH Allowance	2	(0.1%)	(54.1%)	2	(0.1%)	(45.9%)	4	(0.1%)	(100.0%)
	Child Care Allowance	21	(0.6%)	(100.0%)				21	(0.4%)	(100.0%)
	Disability Allowance									
	Medical Allowance	102	(3.0%)	(48.3%)	109	(7.9%)	(51.7%)	211	(4.5%)	(100.0%)
	No Error	27	(0.8%)	(94.1%)	2	(0.1%)	(5.9%)	28	(0.6%)	(100.0%)
Proper Payment	Earned Income	229	(6.8%)	(88.6%)	29	(2.1%)	(11.4%)	258	(5.5%)	(100.0%)
	Pension, Etc.	425	(12.7%)	(63.5%)	244	(17.7%)	(36.5%)	669	(14.1%)	(100.0%)
	Public Assistance	50	(1.5%)	(63.2%)	29	(2.1%)	(36.8%)	80	(1.7%)	(100.0%)
	Other Income	154	(4.6%)	(77.0%)	46	(3.3%)	(23.0%)	200	(4.2%)	(100.0%)
	Asset Income	129	(3.9%)	(70.4%)	54	(4.0%)	(29.6%)	184	(3.9%)	(100.0%)
	Dependent Allowance	30	(0.9%)	(87.8%)	4	(0.3%)	(12.2%)	34	(0.7%)	(100.0%)
	Elderly HH Allowance	23	(0.7%)	(78.3%)	6	(0.5%)	(21.7%)	29	(0.6%)	(100.0%)
	Child Care Allowance	14	(0.4%)	(81.1%)	3	(0.2%)	(18.9%)	17	(0.4%)	(100.0%)
	Disability Allowance									
	Medical Allowance	191	(5.7%)	(54.7%)	158	(11.5%)	(45.3%)	349	(7.4%)	(100.0%)
	No Error	1,486	(44.3%)	(70.7%)	616	(44.7%)	(29.3%)	2,101	(44.4%)	(100.0%)

Overpayment	Earned Income	176	(5.2%)	(85.3%)	30	(2.2%)	(14.7%)	206	(4.4%)	(100.0%)
	Pension, Etc.	144	(4.3%)	(70.3%)	61	(4.4%)	(29.7%)	204	(4.3%)	(100.0%)
	Public Assistance	29	(0.9%)	(82.4%)	6	(0.4%)	(17.6%)	35	(0.7%)	(100.0%)
	Other Income	94	(2.8%)	(88.8%)	12	(0.9%)	(11.2%)	106	(2.2%)	(100.0%)
	Asset Income	40	(1.2%)	(92.2%)	3	(0.2%)	(7.8%)	44	(0.9%)	(100.0%)
	Dependent Allowance	64	(1.9%)	(82.2%)	14	(1.0%)	(17.8%)	78	(1.6%)	(100.0%)
	Elderly HH Allowance	35	(1.1%)	(72.3%)	14	(1.0%)	(27.7%)	49	(1.0%)	(100.0%)
	Child Care Allowance	31	(0.9%)	(94.7%)	2	(0.1%)	(5.3%)	32	(0.7%)	(100.0%)
	Disability Allowance	1	(0.0%)	(100.0%)				1	(0.0%)	(100.0%)
	Medical Allowance	88	(2.6%)	(61.4%)	55	(4.0%)	(38.6%)	143	(3.0%)	(100.0%)
	No Error	10	(0.3%)	(100.0%)				10	(0.2%)	(100.0%)
Total with Rent Error Calculation		3,354	(100.0%)	(70.9%)	1,378	(100.0%)	(29.1%)	4,732	(100.0%)	(100.0%)

2013.9.17 [Weighted]

HUD QC FY 2012
Table 12a. Elderly/Disabled Allowances

Allowances	Non-Elderly/Disabled HH			Elderly/Disabled HH			Total		
	# of Cases (in 1,000)	Col. % of Cases	Row % of Cases	# of Cases (in 1,000)	Col. % of Cases	Row % of Cases	# of Cases (in 1,000)	Col. % of Cases	Row % of Cases
No Allowance	2,035	(99.8%)	(100.0%)				2,035	(43.0%)	(100.0%)
Incorrect Allowance	3	(0.2%)	(4.2%)	79	(2.9%)	(95.8%)	82	(1.7%)	(100.0%)
Correct Allowance				2,614	(97.1%)	(100.0%)	2,614	(55.3%)	(100.0%)
Total	2,038	(100.0%)	(43.1%)	2,693	(100.0%)	(56.9%)	4,732	(100.0%)	(100.0%)

2013.9.17 [Weighted]

HUD QC FY 2012
Table 12b. Dependent Allowances

Allowances	Households Without Dependent(s)			Households With Dependent(s)			Total		
	# of Cases (in 1,000)	Col. % of Cases	Row % of Cases	# of Cases (in 1,000)	Col. % of Cases	Row % of Cases	# of Cases (in 1,000)	Col. % of Cases	Row % of Cases
No Allowance	2,648	(99.7%)	(100.0%)				2,648	(56.0%)	(100.0%)
Incorrect Allowance	9	(0.3%)	(5.7%)	154	(7.4%)	(94.3%)	163	(3.4%)	(100.0%)
Correct Allowance				1,921	(92.6%)	(100.0%)	1,921	(40.6%)	(100.0%)
Total	2,657	(100.0%)	(56.2%)	2,075	(100.0%)	(43.8%)	4,732	(100.0%)	(100.0%)

2013.9.17 [Weighted]

HUD QC FY 2012
Table 13. Calculation Errors on Form HUD-50058/50059

Items	Form HUD-50058		Form HUD-50059		Total	
	# of Errors	# of Cases (in 1,000)	# of Errors	# of Cases (in 1,000)	# of Errors	# of Cases (in 1,000)
Household Composition	123	123			123	123
Net Family Assets and Income	411	263	76	34	487	298
Allowances and Adjusted Income	1,610	1,327			1,610	1,327
Family Rent and Subsidy Information	893	504			893	504

2013.9.17 [Weighted]

HUD QC FY 2012
Table 14. Consistency Errors on Form HUD-50058/50059

Items	Form HUD-50058		Form HUD-50059		Total	
	# of Errors	# of Cases (in 1,000)	# of Errors	# of Cases (in 1,000)	# of Errors	# of Cases (in 1,000)
General Information	49	49	149	118	198	167
Household Composition	176	104	164	150	340	254
Net Family Assets and Income	160	89			160	89
Allowances and Adjusted Income	376	367	6	6	382	373
Family Rent and Subsidy Information	33	30	3	3	36	34

2013.9.17 [Weighted]

HUD QC FY 2012
Table 15a. Verification of Form HUD-50058/50059 Rent Components
Third-Party Verbal or in Writing, Documentation, or EIV

Rent Component	No Verification		Verification				Total	
			Dollar Amount Not Matched		Dollar Amount Matched			
	# of Cases (in 1,000)	Row % of Cases	# of Cases (in 1,000)	Row % of Cases	# of Cases (in 1,000)	Row % of Cases	# of Cases (in 1,000)	Row % of Cases
Earned Income	136	(9.2%)	381	(25.7%)	966	(65.2%)	1,482	(100.0%)
Pension, Etc.	72	(2.6%)	360	(12.8%)	2,382	(84.6%)	2,814	(100.0%)
Public Assistance	95	(18.9%)	65	(13.0%)	342	(68.1%)	502	(100.0%)
Other Income	294	(28.9%)	110	(10.8%)	614	(60.3%)	1,019	(100.0%)
Asset Income	32	(6.9%)	40	(8.5%)	393	(84.6%)	465	(100.0%)
Child Care Expense	20	(11.0%)	24	(13.1%)	137	(75.9%)	181	(100.0%)
Medical Expense	65	(6.2%)	217	(20.5%)	774	(73.3%)	1,056	(100.0%)

2013.9.17 [Weighted]

HUD QC FY 2012
Table 15b. Verification of Form HUD-50058/50059 Rent Components
Third Party in Writing

Rent Component	No Verification		Verification				Total	
			Dollar Amount Not Matched		Dollar Amount Matched			
	# of Cases (in 1,000)	Row % of Cases	# of Cases (in 1,000)	Row % of Cases	# of Cases (in 1,000)	Row % of Cases	# of Cases (in 1,000)	Row % of Cases
Earned Income	966	(65.2%)	128	(8.6%)	388	(26.2%)	1,482	(100.0%)
Pension, Etc.	2,755	(97.9%)	5	(0.2%)	54	(1.9%)	2,814	(100.0%)
Public Assistance	420	(83.7%)	6	(1.3%)	75	(15.0%)	502	(100.0%)
Other Income	874	(85.8%)	17	(1.6%)	128	(12.6%)	1,019	(100.0%)
Asset Income	277	(59.7%)	14	(3.0%)	173	(37.3%)	465	(100.0%)
Child Care Expense	110	(60.6%)	15	(8.3%)	56	(31.1%)	181	(100.0%)
Medical Expense	922	(87.3%)	14	(1.3%)	120	(11.3%)	1,056	(100.0%)

2013.9.17 [Weighted]

HUD QC FY 2012
Table 15c. Verification of Form HUD-50058/50059 Rent Components
Third Party in Writing or EIV/UIV

Rent Component	No Verification		Verification				Total	
			Dollar Amount Not Matched		Dollar Amount Matched			
	# of Cases (in 1,000)	Row % of Cases	# of Cases (in 1,000)	Row % of Cases	# of Cases (in 1,000)	Row % of Cases	# of Cases (in 1,000)	Row % of Cases
Earned Income	856	(57.8%)	169	(11.4%)	457	(30.8%)	1,482	(100.0%)
Pension, Etc.	861	(30.6%)	223	(7.9%)	1,730	(61.5%)	2,814	(100.0%)
Public Assistance	275	(54.9%)	33	(6.6%)	193	(38.5%)	502	(100.0%)
Other Income	685	(67.2%)	48	(4.7%)	286	(28.1%)	1,019	(100.0%)
Asset Income	272	(58.5%)	14	(3.0%)	179	(38.5%)	465	(100.0%)
Child Care Expense	108	(59.7%)	15	(8.3%)	58	(32.0%)	181	(100.0%)
Medical Expense	727	(68.8%)	61	(5.7%)	268	(25.4%)	1,056	(100.0%)

2013.9.17 [Weighted]

HUD QC FY 2012
Table 15d. Verification of Form HUD-50058/50059 Rent Components
Third Party Verbal

Rent Component	No Verification		Verification				Total	
			Dollar Amount Not Matched		Dollar Amount Matched			
	# of Cases (in 1,000)	Row % of Cases	# of Cases (in 1,000)	Row % of Cases	# of Cases (in 1,000)	Row % of Cases	# of Cases (in 1,000)	Row % of Cases
Earned Income	1,472	(99.3%)	3	(0.2%)	7	(0.5%)	1,482	(100.0%)
Pension, Etc.	2,814	(100.0%)					2,814	(100.0%)
Public Assistance	499	(99.4%)			3	(0.6%)	502	(100.0%)
Other Income	1,003	(98.5%)	2	(0.2%)	13	(1.3%)	1,019	(100.0%)
Asset Income	465	(100.0%)					465	(100.0%)
Child Care Expense	178	(98.4%)			3	(1.6%)	181	(100.0%)
Medical Expense	1,054	(99.9%)			2	(0.1%)	1,056	(100.0%)

2013.9.17 [Weighted]

HUD QC FY 2012
Table 15e. Verification of Form HUD-50058/50059 Rent Components
Documentation

Rent Component	No Verification		Verification				Total	
			Dollar Amount Not Matched		Dollar Amount Matched			
	# of Cases (in 1,000)	Row % of Cases	# of Cases (in 1,000)	Row % of Cases	# of Cases (in 1,000)	Row % of Cases	# of Cases (in 1,000)	Row % of Cases
Earned Income	809	(54.6%)	193	(13.0%)	480	(32.4%)	1,482	(100.0%)
Pension, Etc.	2,298	(81.6%)	57	(2.0%)	460	(16.3%)	2,814	(100.0%)
Public Assistance	324	(64.5%)	32	(6.4%)	146	(29.1%)	502	(100.0%)
Other Income	660	(64.8%)	57	(5.6%)	301	(29.6%)	1,019	(100.0%)
Asset Income	296	(63.7%)	10	(2.1%)	159	(34.2%)	465	(100.0%)
Child Care Expense	96	(53.0%)	9	(4.8%)	76	(42.2%)	181	(100.0%)
Medical Expense	695	(65.8%)	76	(7.2%)	285	(27.0%)	1,056	(100.0%)

2013.9.17 [Weighted]

HUD QC FY 2012
Table 15f. Verification of Form HUD-50058/50059 Rent Components
EIV (Enterprise Income Verification)

Rent Component	No Verification		Verification				Total	
			Dollar Amount Not Matched		Dollar Amount Matched			
	# of Cases (in 1,000)	Row % of Cases	# of Cases (in 1,000)	Row % of Cases	# of Cases (in 1,000)	Row % of Cases	# of Cases (in 1,000)	Row % of Cases
Earned Income	1,474	(99.4%)	7	(0.4%)	2	(0.1%)	1,482	(100.0%)
Pension, Etc.	1,098	(39.0%)	192	(6.8%)	1,525	(54.2%)	2,814	(100.0%)
Public Assistance	502	(100.0%)					502	(100.0%)
Other Income	1,013	(99.5%)	3	(0.3%)	2	(0.2%)	1,019	(100.0%)
Asset Income	465	(100.0%)					465	(100.0%)
Child Care Expense	181	(100.0%)					181	(100.0%)
Medical Expense	917	(86.8%)	38	(3.6%)	101	(9.5%)	1,056	(100.0%)

2013.9.17 [Weighted]

HUD QC FY 2012
Table 15g. Verification of Form HUD-50058/50059 Rent Components
UIV (Upfront Income Verification)

Rent Component	No Verification		Verification				Total	
			Dollar Amount Not Matched		Dollar Amount Matched			
	# of Cases (in 1,000)	Row % of Cases	# of Cases (in 1,000)	Row % of Cases	# of Cases (in 1,000)	Row % of Cases	# of Cases (in 1,000)	Row % of Cases
Earned Income	1,386	(93.6%)	31	(2.1%)	64	(4.3%)	1,482	(100.0%)
Pension, Etc.	2,761	(98.1%)			53	(1.9%)	2,814	(100.0%)
Public Assistance	357	(71.2%)	27	(5.3%)	118	(23.5%)	502	(100.0%)
Other Income	839	(82.4%)	28	(2.8%)	151	(14.8%)	1,019	(100.0%)
Asset Income	455	(97.9%)	3	(0.7%)	7	(1.4%)	465	(100.0%)
Child Care Expense	179	(99.1%)			2	(0.9%)	181	(100.0%)
Medical Expense	1,023	(96.9%)	7	(0.6%)	26	(2.4%)	1,056	(100.0%)

2013.9.17 [Weighted]

HUD QC FY 2012
Table 15h. Verification of Form HUD-50058/50059 Rent Components
Third-Party Verbal or in Writing, Documentation, or EIV

Rent Component by Program Type		No Verification		Verification				Total	
				Dollar Amount Not Matched		Dollar Amount Matched			
		# of Cases (in 1,000)	Row % of Cases	# of Cases (in 1,000)	Row % of Cases	# of Cases (in 1,000)	Row % of Cases	# of Cases (in 1,000)	Row % of Cases
Public Housing	Earned Income	51	(12.1%)	129	(31.0%)	238	(56.9%)	418	(100.0%)
	Pension, Etc.	33	(5.4%)	88	(14.6%)	485	(80.0%)	606	(100.0%)
	Public Assistance	26	(20.2%)	14	(11.1%)	88	(68.6%)	128	(100.0%)
	Other Income	83	(37.1%)	26	(11.5%)	115	(51.4%)	224	(100.0%)
	Asset Income	12	(18.1%)	12	(18.7%)	41	(63.2%)	65	(100.0%)
	Child Care Expense	12	(31.8%)	4	(10.8%)	22	(57.3%)	39	(100.0%)
	Medical Expense	22	(10.8%)	50	(24.4%)	131	(64.8%)	203	(100.0%)
PHA-Administered Section 8	Earned Income	58	(7.5%)	190	(24.4%)	532	(68.1%)	781	(100.0%)
	Pension, Etc.	25	(2.0%)	154	(12.3%)	1,069	(85.7%)	1,247	(100.0%)
	Public Assistance	38	(15.1%)	43	(16.8%)	173	(68.1%)	254	(100.0%)
	Other Income	140	(25.6%)	65	(12.0%)	340	(62.4%)	545	(100.0%)
	Asset Income	5	(3.6%)	13	(8.9%)	132	(87.6%)	151	(100.0%)
	Child Care Expense	6	(5.5%)	19	(17.6%)	85	(76.9%)	111	(100.0%)
	Medical Expense	21	(6.8%)	77	(24.5%)	216	(68.6%)	314	(100.0%)
Owner-Administered	Earned Income	27	(9.4%)	61	(21.5%)	196	(69.1%)	283	(100.0%)
	Pension, Etc.	15	(1.5%)	118	(12.3%)	829	(86.2%)	961	(100.0%)
	Public Assistance	30	(25.4%)	8	(7.0%)	80	(67.6%)	119	(100.0%)
	Other Income	71	(28.5%)	19	(7.8%)	160	(63.8%)	251	(100.0%)
	Asset Income	15	(6.0%)	14	(5.7%)	220	(88.3%)	249	(100.0%)
	Child Care Expense	1	(4.8%)			30	(95.2%)	31	(100.0%)
	Medical Expense	22	(4.1%)	90	(16.7%)	427	(79.2%)	539	(100.0%)

2013.9.17 [Weighted]

HUD QC FY 2012
Table 15i. Verification of Form HUD-50058/50059 Rent Components
Third Party in Writing

Rent Component by Program Type		Verification						Total	
		No Verification		Dollar Amount Not Matched		Dollar Amount Matched			
		# of Cases (in 1,000)	Row % of Cases	# of Cases (in 1,000)	Row % of Cases	# of Cases (in 1,000)	Row % of Cases	# of Cases (in 1,000)	Row % of Cases
Public Housing	Earned Income	251	(60.0%)	58	(13.9%)	109	(26.1%)	418	(100.0%)
	Pension, Etc.	603	(99.5%)			3	(0.5%)	606	(100.0%)
	Public Assistance	110	(85.5%)	2	(1.2%)	17	(13.3%)	128	(100.0%)
	Other Income	198	(88.6%)	2	(0.8%)	24	(10.6%)	224	(100.0%)
	Asset Income	43	(67.1%)	7	(10.3%)	15	(22.6%)	65	(100.0%)
	Child Care Expense	20	(51.7%)	4	(10.8%)	15	(37.5%)	39	(100.0%)
	Medical Expense	194	(95.9%)	1	(0.6%)	7	(3.4%)	203	(100.0%)
PHA-Administered Section 8	Earned Income	587	(75.2%)	36	(4.6%)	158	(20.2%)	781	(100.0%)
	Pension, Etc.	1,226	(98.3%)			21	(1.7%)	1,247	(100.0%)
	Public Assistance	232	(91.4%)			22	(8.6%)	254	(100.0%)
	Other Income	494	(90.8%)	9	(1.7%)	41	(7.5%)	545	(100.0%)
	Asset Income	120	(79.6%)	3	(1.7%)	28	(18.7%)	151	(100.0%)
	Child Care Expense	82	(74.5%)	11	(9.8%)	17	(15.8%)	111	(100.0%)
	Medical Expense	293	(93.2%)	5	(1.7%)	16	(5.1%)	314	(100.0%)
Owner-Administered	Earned Income	129	(45.4%)	34	(11.9%)	121	(42.7%)	283	(100.0%)
	Pension, Etc.	926	(96.4%)	5	(0.6%)	30	(3.1%)	961	(100.0%)
	Public Assistance	78	(65.3%)	5	(4.1%)	36	(30.6%)	119	(100.0%)
	Other Income	182	(72.5%)	5	(2.2%)	64	(25.4%)	251	(100.0%)
	Asset Income	114	(45.7%)	5	(1.9%)	131	(52.4%)	249	(100.0%)
	Child Care Expense	7	(22.4%)			24	(77.6%)	31	(100.0%)
	Medical Expense	435	(80.6%)	8	(1.4%)	97	(17.9%)	539	(100.0%)

2013.9.17 [Weighted]

HUD QC FY 2012
Table 15j. Verification of Form HUD-50058/50059 Rent Components
Third Party in Writing or EIV/UIV

Rent Component by Program Type		Verification						Total	
		No Verification		Dollar Amount Not Matched		Dollar Amount Matched			
		# of Cases (in 1,000)	Row % of Cases	# of Cases (in 1,000)	Row % of Cases	# of Cases (in 1,000)	Row % of Cases	# of Cases (in 1,000)	Row % of Cases
Public Housing	Earned Income	211	(50.5%)	75	(17.9%)	132	(31.6%)	418	(100.0%)
	Pension, Etc.	226	(37.4%)	50	(8.3%)	329	(54.3%)	606	(100.0%)
	Public Assistance	73	(56.7%)	7	(5.3%)	49	(38.0%)	128	(100.0%)
	Other Income	167	(74.7%)	8	(3.5%)	49	(21.8%)	224	(100.0%)
	Asset Income	43	(67.1%)	7	(10.3%)	15	(22.6%)	65	(100.0%)
	Child Care Expense	20	(51.7%)	4	(10.8%)	15	(37.5%)	39	(100.0%)
	Medical Expense	139	(68.4%)	22	(10.8%)	42	(20.8%)	203	(100.0%)
PHA-Administered Section 8	Earned Income	535	(68.5%)	57	(7.3%)	189	(24.2%)	781	(100.0%)
	Pension, Etc.	337	(27.0%)	94	(7.5%)	817	(65.5%)	1,247	(100.0%)
	Public Assistance	142	(55.9%)	22	(8.5%)	91	(35.7%)	254	(100.0%)
	Other Income	371	(68.1%)	29	(5.3%)	145	(26.5%)	545	(100.0%)
	Asset Income	120	(79.6%)	3	(1.7%)	28	(18.7%)	151	(100.0%)
	Child Care Expense	82	(74.5%)	11	(9.8%)	17	(15.8%)	111	(100.0%)
	Medical Expense	221	(70.2%)	22	(7.1%)	71	(22.6%)	314	(100.0%)
Owner-Administered	Earned Income	110	(39.0%)	37	(13.0%)	136	(48.0%)	283	(100.0%)
	Pension, Etc.	298	(31.0%)	79	(8.2%)	585	(60.8%)	961	(100.0%)
	Public Assistance	60	(50.7%)	5	(4.1%)	54	(45.2%)	119	(100.0%)
	Other Income	147	(58.7%)	11	(4.4%)	92	(36.9%)	251	(100.0%)
	Asset Income	108	(43.5%)	5	(1.9%)	136	(54.6%)	249	(100.0%)
	Child Care Expense	5	(17.2%)			26	(82.8%)	31	(100.0%)
	Medical Expense	368	(68.2%)	16	(3.0%)	155	(28.8%)	539	(100.0%)

2013.9.17 [Weighted]

HUD QC FY 2012
Table 15k. Verification of Form HUD-50058/50059 Rent Components
Third-Party Verbal

Rent Component by Program Type		No Verification		Verification				Total	
				Dollar Amount Not Matched		Dollar Amount Matched			
		# of Cases (in 1,000)	Row % of Cases	# of Cases (in 1,000)	Row % of Cases	# of Cases (in 1,000)	Row % of Cases	# of Cases (in 1,000)	Row % of Cases
Public Housing	Earned Income	412	(98.7%)	3	(0.6%)	3	(0.7%)	418	(100.0%)
	Pension, Etc.	606	(100.0%)					606	(100.0%)
	Public Assistance	125	(97.8%)			3	(2.2%)	128	(100.0%)
	Other Income	224	(100.0%)					224	(100.0%)
	Asset Income	65	(100.0%)					65	(100.0%)
	Child Care Expense	37	(96.4%)			1	(3.6%)	39	(100.0%)
	Medical Expense	201	(99.2%)			2	(0.8%)	203	(100.0%)
PHA-Administered Section 8	Earned Income	778	(99.7%)			3	(0.3%)	781	(100.0%)
	Pension, Etc.	1,247	(100.0%)					1,247	(100.0%)
	Public Assistance	254	(100.0%)					254	(100.0%)
	Other Income	534	(98.2%)	2	(0.4%)	8	(1.4%)	545	(100.0%)
	Asset Income	151	(100.0%)					151	(100.0%)
	Child Care Expense	109	(98.6%)			2	(1.4%)	111	(100.0%)
	Medical Expense	314	(100.0%)					314	(100.0%)
Owner-Administered	Earned Income	282	(99.5%)			2	(0.5%)	283	(100.0%)
	Pension, Etc.	961	(100.0%)					961	(100.0%)
	Public Assistance	119	(100.0%)					119	(100.0%)
	Other Income	245	(97.9%)			5	(2.1%)	251	(100.0%)
	Asset Income	249	(100.0%)					249	(100.0%)
	Child Care Expense	31	(100.0%)					31	(100.0%)
	Medical Expense	539	(100.0%)					539	(100.0%)

2013.9.17 [Weighted]

HUD QC FY 2012
Table 15l. Verification of Form HUD-50058/59 Rent Components Documentation

Rent Component by Program Type		No Verification		Verification				Total	
				Dollar Amount Not Matched		Dollar Amount Matched			
		# of Cases (in 1,000)	Row % of Cases	# of Cases (in 1,000)	Row % of Cases	# of Cases (in 1,000)	Row % of Cases	# of Cases (in 1,000)	Row % of Cases
Public Housing	Earned Income	279	(66.8%)	44	(10.5%)	95	(22.7%)	418	(100.0%)
	Pension, Etc.	478	(78.9%)	21	(3.4%)	107	(17.7%)	606	(100.0%)
	Public Assistance	84	(65.7%)	7	(5.8%)	37	(28.5%)	128	(100.0%)
	Other Income	144	(64.3%)	18	(8.0%)	62	(27.7%)	224	(100.0%)
	Asset Income	42	(64.3%)	5	(8.4%)	18	(27.3%)	65	(100.0%)
	Child Care Expense	33	(83.7%)			6	(16.3%)	39	(100.0%)
	Medical Expense	138	(68.2%)	9	(4.6%)	55	(27.2%)	203	(100.0%)
PHA-Administered Section 8	Earned Income	327	(41.9%)	125	(16.0%)	328	(42.1%)	781	(100.0%)
	Pension, Etc.	1,056	(84.7%)	21	(1.7%)	170	(13.6%)	1,247	(100.0%)
	Public Assistance	151	(59.3%)	21	(8.3%)	82	(32.4%)	254	(100.0%)
	Other Income	331	(60.8%)	31	(5.7%)	182	(33.5%)	545	(100.0%)
	Asset Income	56	(36.9%)	2	(1.6%)	93	(61.5%)	151	(100.0%)
	Child Care Expense	36	(32.4%)	9	(7.9%)	66	(59.8%)	111	(100.0%)
	Medical Expense	169	(53.7%)	41	(13.1%)	104	(33.2%)	314	(100.0%)
Owner-Administered	Earned Income	203	(71.5%)	24	(8.4%)	57	(20.0%)	283	(100.0%)
	Pension, Etc.	764	(79.4%)	15	(1.5%)	183	(19.0%)	961	(100.0%)
	Public Assistance	89	(74.7%)	3	(2.9%)	27	(22.5%)	119	(100.0%)
	Other Income	185	(73.9%)	8	(3.3%)	57	(22.8%)	251	(100.0%)
	Asset Income	199	(79.8%)	2	(0.7%)	49	(19.5%)	249	(100.0%)
	Child Care Expense	27	(87.6%)			4	(12.4%)	31	(100.0%)
	Medical Expense	388	(72.0%)	26	(4.8%)	125	(23.3%)	539	(100.0%)

2013.9.17 [Weighted]

HUD QC FY 2012
Table 15m. Verification of Form HUD-50058/50059 Rent Components
EIV (Enterprise Income Verification)

Rent Component by Program Type		No Verification		Verification				Total	
				Dollar Amount Not Matched		Dollar Amount Matched			
		# of Cases (in 1,000)	Row % of Cases	# of Cases (in 1,000)	Row % of Cases	# of Cases (in 1,000)	Row % of Cases	# of Cases (in 1,000)	Row % of Cases
Public Housing	Earned Income	413	(98.8%)	4	(0.8%)	2	(0.4%)	418	(100.0%)
	Pension, Etc.	255	(42.2%)	44	(7.2%)	307	(50.6%)	606	(100.0%)
	Public Assistance	128	(100.0%)					128	(100.0%)
	Other Income	221	(99.1%)			2	(0.9%)	224	(100.0%)
	Asset Income	65	(100.0%)					65	(100.0%)
	Child Care Expense	39	(100.0%)					39	(100.0%)
	Medical Expense	158	(78.2%)	16	(7.9%)	28	(13.9%)	203	(100.0%)
PHA-Administered Section 8	Earned Income	781	(100.0%)					781	(100.0%)
	Pension, Etc.	425	(34.0%)	94	(7.5%)	729	(58.4%)	1,247	(100.0%)
	Public Assistance	254	(100.0%)					254	(100.0%)
	Other Income	541	(99.4%)	3	(0.6%)			545	(100.0%)
	Asset Income	151	(100.0%)					151	(100.0%)
	Child Care Expense	111	(100.0%)					111	(100.0%)
	Medical Expense	250	(79.6%)	17	(5.5%)	47	(14.9%)	314	(100.0%)
Owner-Administered	Earned Income	280	(98.9%)	3	(1.1%)			283	(100.0%)
	Pension, Etc.	418	(43.5%)	54	(5.6%)	489	(50.9%)	961	(100.0%)
	Public Assistance	119	(100.0%)					119	(100.0%)
	Other Income	251	(100.0%)					251	(100.0%)
	Asset Income	249	(100.0%)					249	(100.0%)
	Child Care Expense	31	(100.0%)					31	(100.0%)
	Medical Expense	508	(94.3%)	5	(1.0%)	26	(4.8%)	539	(100.0%)

2013.9.17 [Weighted]

HUD QC FY 2012
Table 15n. Verification of Form HUD-50058/50059 Rent Components
UIV (Upfront Income Verification)

Rent Component by Program Type		No Verification		Verification				Total	
				Dollar Amount Not Matched		Dollar Amount Matched			
		# of Cases (in 1,000)	Row % of Cases	# of Cases (in 1,000)	Row % of Cases	# of Cases (in 1,000)	Row % of Cases	# of Cases (in 1,000)	Row % of Cases
Public Housing	Earned Income	388	(92.9%)	10	(2.3%)	20	(4.8%)	418	(100.0%)
	Pension, Etc.	602	(99.3%)			4	(0.7%)	606	(100.0%)
	Public Assistance	91	(71.3%)	5	(4.1%)	32	(24.6%)	128	(100.0%)
	Other Income	196	(87.5%)	6	(2.7%)	22	(9.8%)	224	(100.0%)
	Asset Income	64	(98.3%)			1	(1.7%)	65	(100.0%)
	Child Care Expense	39	(100.0%)					39	(100.0%)
	Medical Expense	200	(98.7%)			3	(1.3%)	203	(100.0%)
PHA-Administered Section 8	Earned Income	729	(93.3%)	21	(2.7%)	31	(3.9%)	781	(100.0%)
	Pension, Etc.	1,211	(97.1%)			36	(2.9%)	1,247	(100.0%)
	Public Assistance	164	(64.5%)	22	(8.5%)	69	(27.0%)	254	(100.0%)
	Other Income	424	(77.9%)	16	(3.0%)	104	(19.1%)	545	(100.0%)
	Asset Income	148	(97.8%)	3	(2.2%)			151	(100.0%)
	Child Care Expense	111	(100.0%)					111	(100.0%)
	Medical Expense	302	(96.3%)			12	(3.7%)	314	(100.0%)
Owner-Administered	Earned Income	270	(95.2%)			14	(4.8%)	283	(100.0%)
	Pension, Etc.	948	(98.6%)			13	(1.4%)	961	(100.0%)
	Public Assistance	102	(85.4%)			17	(14.6%)	119	(100.0%)
	Other Income	220	(87.6%)	6	(2.3%)	25	(10.1%)	251	(100.0%)
	Asset Income	244	(97.8%)			5	(2.2%)	249	(100.0%)
	Child Care Expense	30	(94.7%)			2	(5.3%)	31	(100.0%)
	Medical Expense	521	(96.6%)	7	(1.3%)	11	(2.1%)	539	(100.0%)

2013.9.17 [Weighted]

HUD QC FY 2012
Table 16a. QC Rent Component for Households With QC Rent Error (>$5)

Rent Component		Form HUD-50058		Form HUD-50059		Total	
		# of Cases (in 1,000)	% of Cases	# of Cases (in 1,000)	% of Cases	# of Cases (in 1,000)	% of Cases
Earned Income	0	3,000	(89.5%)	1,284	(93.2%)	4,285	(90.6%)
	1	353	(10.5%)	94	(6.8%)	447	(9.4%)
Pension, Etc.	0	3,012	(89.8%)	1,182	(85.8%)	4,194	(88.6%)
	1	342	(10.2%)	196	(14.2%)	538	(11.4%)
Public Assistance	0	3,270	(97.5%)	1,361	(98.7%)	4,631	(97.9%)
	1	83	(2.5%)	18	(1.3%)	101	(2.1%)
Other Income	0	3,183	(94.9%)	1,337	(97.0%)	4,520	(95.5%)
	1	170	(5.1%)	41	(3.0%)	212	(4.5%)
Asset Income	0	3,285	(98.0%)	1,337	(97.0%)	4,623	(97.7%)
	1	68	(2.0%)	41	(3.0%)	109	(2.3%)
Child Care Expense	0	3,302	(98.5%)	1,376	(99.9%)	4,679	(98.9%)
	1	51	(1.5%)	2	(0.1%)	53	(1.1%)
Disability Expense	0	3,352	(100.0%)	1,378	(100.0%)	4,731	(100.0%)
	1	1	(0.0%)			1	(0.0%)
Medical Expense	0	3,140	(93.6%)	1,212	(88.0%)	4,353	(92.0%)
	1	213	(6.4%)	166	(12.0%)	379	(8.0%)
All Components	No Error	2,474	(73.8%)	1,042	(75.6%)	3,516	(74.3%)
	With Error	879	(26.2%)	336	(24.4%)	1,215	(25.7%)
Total		3,354	(100.0%)	1,378	(100.0%)	4,732	(100.0%)

2013.9.17 [Weighted]

HUD QC FY 2012

Table 16b. QC Error Cases With Missing Verification in Tenant File

Rent Component		Form HUD-50058		Form HUD-50059		Total	
		# of Cases (in 1,000)	% of Cases	# of Cases (in 1,000)	% of Cases	# of Cases (in 1,000)	% of Cases
Earned Income	Verified	180	(51.0%)	49	(52.4%)	229	(51.3%)
	Not Verified	173	(49.0%)	45	(47.6%)	218	(48.7%)
Pension, Etc.	Verified	185	(54.0%)	80	(40.5%)	264	(49.1%)
	Not Verified	157	(46.0%)	117	(59.5%)	274	(50.9%)
Public Assistance	Verified	32	(38.8%)	4	(20.7%)	36	(35.7%)
	Not Verified	51	(61.2%)	14	(79.3%)	65	(64.3%)
Other Income	Verified	48	(28.2%)	13	(31.4%)	61	(28.8%)
	Not Verified	122	(71.8%)	28	(68.6%)	151	(71.2%)
Asset Income	Verified	18	(26.5%)	16	(39.9%)	34	(31.5%)
	Not Verified	50	(73.5%)	25	(60.1%)	75	(68.5%)
Child Care Expense	Verified	12	(23.0%)			12	(22.2%)
	Not Verified	39	(77.0%)	2	(100.0%)	41	(77.8%)
Disability Expense	Not Verified	1	(100.0%)			1	(100.0%)
Medical Expense	Verified	37	(17.6%)	28	(17.0%)	66	(17.3%)
	Not Verified	176	(82.4%)	138	(83.0%)	313	(82.7%)

2013.9.17 [Weighted]

HUD QC FY 2012
Table 17a. Administrative Error: Number and Percent of Households, Average Dollars in Error For Non-MTW Households With Recalculated 50058/50059 Rent Error by Administrative Error Type

Error Type	Non-MTW Households with Recalculated 50058/50059 Rent Error		
	# of Households in Error	% of Households in Error	Average Gross Dollar Error
Transcription Error	169	(39.5%)	32.38
No Transcription Error	259	(60.5%)	20.32
Consistency Error	58	(13.6%)	52.22
No Consistency Error	370	(86.4%)	20.80
Allowances Calculation Error	5	(1.1%)	1.00
No Allowances Calculation Error	423	(98.9%)	25.34
Income Calculation Error	12	(2.9%)	86.47
No Income Calculation Error	416	(97.1%)	23.26
Other Calculation Error	10	(2.4%)	1.00
No Other Calculation Error	418	(97.6%)	25.67
Overdue Recertification	4	(1.0%)	1.00
On-time Recertification	387	(90.5%)	26.58
Certification	36	(8.5%)	11.82
Any Administrative/Procedural Error	190	(44.4%)	33.14
No Administrative/Procedural Error	238	(55.6%)	18.64
Total Households	428	(100.0%)	25.08

Note: Data presented above excludes Moving to Work Households

2013.9.17 [Weighted]

HUD QC FY 2012
Table 17b. Administrative Error: Number and Percent of Households, Average Dollars in Error For Households With QC Rent Error by Administrative Error Type

Error Type	Households with QC Rent Error		
	# of Households in Error	% of Households in Error	Average Gross Dollar Error
Transcription Error	1,014	(73.5%)	44.89
No Transcription Error	365	(26.5%)	58.48
Consistency Error	291	(21.1%)	42.97
No Consistency Error	1,088	(78.9%)	49.96
Allowances Calculation Error	38	(2.7%)	38.88
No Allowances Calculation Error	1,342	(97.3%)	48.76
Income Calculation Error	21	(1.5%)	29.20
No Income Calculation Error	1,359	(98.5%)	48.78
Other Calculation Error	51	(3.7%)	49.97
No Other Calculation Error	1,328	(96.3%)	48.43
Overdue Recertification	31	(2.3%)	95.24
On-time Recertification	1,196	(86.7%)	47.78
Certification	152	(11.0%)	44.51
Any Administrative/Procedural Error	1,090	(79.0%)	43.84
No Administrative/Procedural Error	289	(21.0%)	66.00
Total Households	1,379	(100.0%)	48.49

2013.9.17 [Weighted]

HUD QC FY 2012
Table 18. Administrative Error: Number and Percent of Households, Average Dollars in Error For All Households by Administrative Error Type

Error Type	Gross QC Rent Error			Net QC Rent Error		
	# of Households	% of Households	Average Dollar Error	# of Households	% of Households	Average Dollar Error
Transcription Error	2,043	(43.2%)	22.57	2,043	(43.2%)	-5.50
No Transcription Error	2,688	(56.8%)	8.11	2,688	(56.8%)	-3.36
Consistency Error	833	(17.6%)	15.22	833	(17.6%)	-5.18
No Consistency Error	3,898	(82.4%)	14.17	3,898	(82.4%)	-4.09
Allowances Calculation Error	89	(1.9%)	17.04	89	(1.9%)	-4.36
No Allowances Calculation Error	4,643	(98.1%)	14.30	4,643	(98.1%)	-4.28
Income Calculation Error	80	(1.7%)	8.31	80	(1.7%)	2.33
No Income Calculation Error	4,651	(98.3%)	14.46	4,651	(98.3%)	-4.40
Other Calculation Error	123	(2.6%)	20.89	123	(2.6%)	2.40
No Other Calculation Error	4,609	(97.4%)	14.18	4,609	(97.4%)	-4.46
Overdue Recertification	43	(0.9%)	69.13	43	(0.9%)	-7.99
On-time Recertification	4,149	(87.7%)	14.00	4,149	(87.7%)	-4.37
Certification	540	(11.4%)	12.74	540	(11.4%)	-3.34
Any Administrative/Procedural Error	2,493	(52.7%)	19.43	2,493	(52.7%)	-4.94
No Administrative/Procedural Error	2,238	(47.3%)	8.70	2,238	(47.3%)	-3.56
Total	4,732	(100.0%)	14.35	4,732	(100.0%)	-4.28

2013.9.17 [Weighted]

HUD QC FY 2012
Table 19. Occupancy Standards on Form HUD-50058/50059

Number of Bedrooms by Occupancy Standard		Public Housing		PHA-Administered Section 8		Owner-Administered		Total	
		# of Cases (in 1,000)	% of Cases	# of Cases (in 1,000)	% of Cases	# of Cases (in 1,000)	% of Cases	# of Cases (in 1,000)	% of Cases
Under-Housed	0	4	(6.5%)			1	(1.7%)	6	(2.9%)
	1			5	(0.9%)	3	(0.4%)	8	(0.5%)
	2	5	(1.3%)	4	(0.6%)			10	(0.7%)
	3	3	(1.1%)	13	(1.9%)			16	(1.5%)
	4	1	(1.4%)	9	(5.2%)			9	(3.8%)
	5+			3	(13.5%)			3	(7.6%)
	All Units	13	(1.2%)	33	(1.5%)	5	(0.4%)	52	(1.1%)
Correct	0	62	(93.5%)	48	(100.0%)	80	(98.3%)	190	(97.1%)
	1	356	(100.0%)	527	(99.1%)	833	(99.6%)	1,716	(99.5%)
	2	295	(73.8%)	539	(71.5%)	247	(80.8%)	1,082	(74.1%)
	3	212	(80.3%)	504	(75.0%)	113	(87.5%)	829	(77.8%)
	4	28	(51.7%)	87	(51.7%)	9	(38.6%)	124	(50.5%)
	5+	3	(19.1%)	3	(13.5%)	2	(100.0%)	7	(19.5%)
	All Units	956	(82.8%)	1,709	(77.8%)	1,284	(93.2%)	3,949	(83.5%)
Over-Housed	2	99	(24.8%)	211	(28.0%)	59	(19.2%)	369	(25.3%)
	3	49	(18.6%)	156	(23.1%)	16	(12.5%)	221	(20.7%)
	4	26	(46.9%)	72	(43.1%)	14	(61.4%)	112	(45.6%)
	5+	12	(80.9%)	15	(73.1%)			27	(72.9%)
	All Units	186	(16.1%)	454	(20.7%)	89	(6.5%)	729	(15.4%)

2013.9.17 [Weighted]

HUD QC FY 2012
Table 19a. Frequency and Percent of All Households
by Number of Bedrooms and Number of Household Members

Number of Bedrooms	Number of Household Members																					
	1		2		3		4		5		6		7		8		9		10		11	
	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%
0	190	97.1%	6	2.9%																		
1	1,572	91.2%	144	8.4%	6	0.4%					2	0.1%										
2	369	25.3%	715	49.0%	264	18.1%	103	7.0%	8	0.6%	1	0.1%										
3	80	7.5%	141	13.2%	378	35.4%	296	27.8%	119	11.2%	36	3.4%	5	0.5%	3	0.3%	2	0.2%	1	0.1%	4	0.4%
4	8	3.3%	7	2.7%	31	12.5%	67	27.1%	57	23.3%	24	9.8%	29	11.9%	14	5.5%	4	1.5%	3	1.1%	3	1.2%
5+	3	7.5%	1	4.0%	8	22.3%	4	9.8%	4	9.7%	7	19.6%	3	7.6%	3	8.6%	1	3.4%			3	7.6%

2013.9.17 [Weighted]

Source Tables Based on Tenant File Data

HUD QC FY 2012 [Tenant File]
Table 2. Percent of Households by Payment Type and Program Type

Program Type		Underpayment			Proper Payment			Overpayment			Total		
		# of Cases (in 1,000)	Row % of Cases	Col. % of Cases	# of Cases (in 1,000)	Row % of Cases	Col. % of Cases	# of Cases (in 1,000)	Row % of Cases	Col. % of Cases	# of Cases (in 1,000)	Row % of Cases	Col. % of Cases
PHA-Administered	Public Housing	110	(9.5%)	(22.6%)	899	(78.0%)	(24.2%)	144	(12.5%)	(27.4%)	1,152	(100.0%)	(24.4%)
	Section 8	239	(10.9%)	(49.3%)	1,699	(77.3%)	(45.7%)	260	(11.8%)	(49.6%)	2,199	(100.0%)	(46.5%)
	Total	349	(10.4%)	(71.9%)	2,598	(77.5%)	(69.9%)	404	(12.0%)	(77.0%)	3,351	(100.0%)	(70.9%)
Owner-Administered	Owner-Administered	137	(9.9%)	(28.1%)	1,121	(81.3%)	(30.1%)	121	(8.8%)	(23.0%)	1,378	(100.0%)	(29.1%)
	Total	137	(9.9%)	(28.1%)	1,121	(81.3%)	(30.1%)	121	(8.8%)	(23.0%)	1,378	(100.0%)	(29.1%)
Total		486	(10.3%)	(100.0%)	3,719	(78.6%)	(100.0%)	524	(11.1%)	(100.0%)	4,729	(100.0%)	(100.0%)

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HUD QC FY 2012 [Tenant File]
Table 2(S). Percent of Households by Payment Type and Program Type
(Proper Payment Based on Exact Match of Actual and QC Rent)

Program Type		Underpayment			Proper Payment			Overpayment			Total		
		# of Cases (in 1,000)	Row % of Cases	Col. % of Cases	# of Cases (in 1,000)	Row % of Cases	Col. % of Cases	# of Cases (in 1,000)	Row % of Cases	Col. % of Cases	# of Cases (in 1,000)	Row % of Cases	Col. % of Cases
PHA-Administered	Public Housing	143	(12.4%)	(23.0%)	748	(64.9%)	(23.8%)	262	(22.7%)	(27.0%)	1,152	(100.0%)	(24.4%)
	Section 8	298	(13.5%)	(47.9%)	1,387	(63.1%)	(44.2%)	514	(23.4%)	(53.0%)	2,199	(100.0%)	(46.5%)
	Total	440	(13.1%)	(70.9%)	2,135	(63.7%)	(68.0%)	776	(23.1%)	(80.0%)	3,351	(100.0%)	(70.9%)
Owner-Administered	Owner-Administered	181	(13.1%)	(29.1%)	1,004	(72.8%)	(32.0%)	194	(14.1%)	(20.0%)	1,378	(100.0%)	(29.1%)
	Total	181	(13.1%)	(29.1%)	1,004	(72.8%)	(32.0%)	194	(14.1%)	(20.0%)	1,378	(100.0%)	(29.1%)
Total		621	(13.1%)	(100.0%)	3,139	(66.4%)	(100.0%)	970	(20.5%)	(100.0%)	4,729	(100.0%)	(100.0%)

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HUD QC FY 2012 [Tenant File]
Table 3. Dollar Rent Error by Program Type

Program Type		Actual Rent (Monthly)				DC Rent (Monthly)				Gross Rent Error (Monthly)			
		# of Cases (in 1,000)	Col. % of Cases	Sum Dollar Amount (in 1,000)	Avg. Dollar Amount	# of Cases (in 1,000)	Col. % of Cases	Sum Dollar Amount (in 1,000)	Avg. Dollar Amount	# of Cases (in 1,000)	Col. % of Cases	Sum Dollar Amount (in 1,000)	Avg. Dollar Amount
PHA-Administered	Public Housing	1,152	(24.4%)	271,684	235.79	1,152	(24.4%)	270,880	235.09	1,152	(24.4%)	21,323	18.51
	Section 8	2,199	(46.5%)	482,680	219.53	2,199	(46.5%)	481,675	219.07	2,199	(46.5%)	25,148	11.44
	Total	3,351	(70.9%)	754,365	225.12	3,351	(70.9%)	752,555	224.58	3,351	(70.9%)	46,471	13.87
Owner-Administered	Owner-Administered	1,378	(29.1%)	299,414	217.26	1,378	(29.1%)	301,994	219.13	1,378	(29.1%)	12,041	8.74
	Total	1,378	(29.1%)	299,414	217.26	1,378	(29.1%)	301,994	219.13	1,378	(29.1%)	12,041	8.74
Total		4,729	(100.0%)	1,053,778	222.83	4,729	(100.0 %)	1,054,549	222.99	4,729	(100.0%)	58,512	12.37

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HUD QC FY 2012 [Tenant File]
Table 4. Dollar Error Amount by Payment Type and Program Type

Program Type		Underpayment (Monthly)				Overpayment (Monthly)				DC Rent (Monthly)			
		# of Cases (in 1,000)	Col. % of Cases	Sum Dollar Amount (in 1,000)	Avg. Dollar Amount	# of Cases (in 1,000)	Col. % of Cases	Sum Dollar Amount (in 1,000)	Avg. Dollar Amount	# of Cases (in 1,000)	Col. % of Cases	Sum Dollar Amount (in 1,000)	Avg. Dollar Amount
PHA-Administered	Public Housing	110	(22.6%)	10,308	93.94	144	(27.4%)	11,015	76.67	1,152	(24.4%)	270,880	235.09
	Section 8	239	(49.3%)	12,149	50.78	260	(49.6%)	12,999	49.98	2,199	(46.5%)	481,675	219.07
	Total	349	(71.9%)	22,456	64.36	404	(77.0%)	24,014	59.47	3,351	(70.9%)	752,555	224.58
Owner-Administered	Owner-Administered	137	(28.1%)	7,328	53.61	121	(23.0%)	4,713	39.06	1,378	(29.1%)	301,994	219.13
	Total	137	(28.1%)	7,328	53.61	121	(23.0%)	4,713	39.06	1,378	(29.1%)	301,994	219.13
Total		486	(100.0%)	29,785	61.33	524	(100.0 %)	28,727	54.78	4,729	(100.0%)	1,054,549	222.99

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HUD QC FY 2012 [Tenant File]
Table 4(S). Dollar Error Amount by Payment Type and Program Type
(Proper Payment Based on Exact Match of Actual and QC Rent)

Program Type		Underpayment (Monthly)				Overpayment (Monthly)				DC Rent (Monthly)			
		# of Cases (in 1,000)	Col. % of Cases	Sum Dollar Amount (in 1,000)	Avg. Dollar Amount	# of Cases (in 1,000)	Col. % of Cases	Sum Dollar Amount (in 1,000)	Avg. Dollar Amount	# of Cases (in 1,000)	Col. % of Cases	Sum Dollar Amount (in 1,000)	Avg. Dollar Amount
PHA-Administered	Public Housing	143	(23.0%)	10,384	72.77	262	(27.0%)	11,189	42.72	1,152	(24.4%)	270,880	235.09
	Section 8	298	(47.9%)	12,315	41.38	514	(53.0%)	13,321	25.93	2,199	(46.5%)	481,675	219.07
	Total	440	(70.9%)	22,700	51.56	776	(80.0%)	24,510	31.60	3,351	(70.9%)	752,555	224.58
Owner-Administered	Owner-Administered	181	(29.1%)	7,433	41.18	194	(20.0%)	4,853	25.02	1,378	(29.1%)	301,994	219.13
	Total	181	(29.1%)	7,433	41.18	194	(20.0%)	4,853	25.02	1,378	(29.1%)	301,994	219.13
Total		621	(100.0%)	30,133	48.54	970	(100.0%)	29,363	30.28	4,729	(100.0%)	1,054,549	222.99

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HUD QC FY 2012 [Tenant File]
Table 5. Gross and Net Rent Error by Program Type

Program Type		Gross Rent Error (Monthly)				Net Rent Error (Monthly)				DC Rent (Monthly)			
		# of Cases (in 1,000)	Col. % of Cases	Sum Dollar Amount (in 1,000)	Avg. Dollar Amount	# of Cases (in 1,000)	Col. % of Cases	Sum Dollar Amount (in 1,000)	Avg. Dollar Amount	# of Cases (in 1,000)	Col. % of Cases	Sum Dollar Amount (in 1,000)	Avg. Dollar Amount
PHA-Administered	Public Housing	1,152	(24.4%)	21,323	18.51	1,152	(24.4%)	708	0.61	1,152	(24.4%)	270,880	235.09
	Section 8	2,199	(46.5%)	25,148	11.44	2,199	(46.5%)	850	0.39	2,199	(46.5%)	481,675	219.07
	Total	3,351	(70.9%)	46,471	13.87	3,351	(70.9%)	1,558	0.46	3,351	(70.9%)	752,555	224.58
Owner-Administered	Owner-Administered	1,378	(29.1%)	12,041	8.74	1,378	(29.1%)	-2,616	-1.90	1,378	(29.1%)	301,994	219.13
	Total	1,378	(29.1%)	12,041	8.74	1,378	(29.1%)	-2,616	-1.90	1,378	(29.1%)	301,994	219.13
Total		4,729	(100.0%)	58,512	12.37	4,729	(100.0%)	-1,058	-0.22	4,729	(100.0%)	1,054,549	222.99

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HUD QC FY 2012 [Tenant File]
Table 5(S). Gross and Net Rent Error by Program Type
(Proper Payment Based on Exact Match of Actual and QC Rent)

Program Type		Gross Rent Error (Monthly)				Net Rent Error (Monthly)				DC Rent (Monthly)			
		# of Cases (in 1,000)	Col. % of Cases	Sum Dollar Amount (in 1,000)	Avg. Dollar Amount	# of Cases (in 1,000)	Col. % of Cases	Sum Dollar Amount (in 1,000)	Avg. Dollar Amount	# of Cases (in 1,000)	Col. % of Cases	Sum Dollar Amount (in 1,000)	Avg. Dollar Amount
PHA-Administered	Public Housing	1,152	(24.4%)	21,574	18.72	1,152	(24.4%)	805	0.70	1,152	(24.4%)	270,880	235.09
	Section 8	2,199	(46.5%)	25,636	11.66	2,199	(46.5%)	1,005	0.46	2,199	(46.5%)	481,675	219.07
	Total	3,351	(70.9%)	47,210	14.09	3,351	(70.9%)	1,810	0.54	3,351	(70.9%)	752,555	224.58
Owner-Administered	Owner-Administered	1,378	(29.1%)	12,286	8.91	1,378	(29.1%)	-2,580	-1.87	1,378	(29.1%)	301,994	219.13
	Total	1,378	(29.1%)	12,286	8.91	1,378	(29.1%)	-2,580	-1.87	1,378	(29.1%)	301,994	219.13
Total		4,729	(100.0%)	59,496	12.58	4,729	(100.0%)	-770	-0.16	4,729	(100.0%)	1,054,549	222.99

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Appendix E: Consistency and Calculation Errors

APPENDIX E: CONSISTENCY AND CALCULATION ERRORS

50058 Form—Consistency Errors

50058 Item		Error
General Information		
1c.	Program	Must equal P, CE, VO, or MR
2a.	Type of Action	Must equal 1 through 15
2b.	Effective Date of Action	Cannot be earlier than Date of Admission to the Program (2h)
Household Composition		
3g.	Sex	Must equal M or F
3h.	Relationship	Must equal H, S, K, F, Y, E, L, or A
3i.	Citizenship	Must equal EC, EN, IN, PV
3k.	Race	Must equal 1 through 5
3m.	Ethnicity	Must equal 1 or 2
3u.	Family Subsidy Status	Must equal C, E, F, P
3v.	Effective Date	Should not be blank if 3u equals C
Net Family Assets and Income		
6a.	Family Member No.	Must equal a number used in Section 3. Household
7a.	Family Member No.	Must equal a number used in Section 3. Household
7b.	Income Code	Must equal B, F, HA, M, W, G, IW, T, P, S, SS, C, E, I, N, or U
8a.	Total Annual Income	Must equal Total Annual Income recorded in 7i
8i.	Earnings Made Possible by Disability Assistance Expense	Must be ≤ the sum of Dollars per Year (7d) for Income Codes (7b) HA, F, W, B, or M
Allowances and Adjusted Income		
8h.	Maximum Disability Allowance	Should only be completed if any member is disabled
8j.	Allowable Disability Assistance Expense	• Should be ≤ Maximum Disability Allowance (8h) • Should be 0 if Medical/Disability Threshold (8f) is > Maximum Disability Allowance (8h) • Should be 0 or blank if Maximum Disability Allowance (8h) is 0 or blank
8k.	Total Medical Expenses	Should only be completed if the head, spouse, or co-head is 62 or over, or disabled; otherwise it should be blank
8n.	Medical/Disability Assistance Allowance	• Should equal Total Annual Disability Assistance and Medical Expense (8m) minus Medical/disability Threshold (8f) if Allowable Disability Expense (8j) is blank or if the Total Annual Unreimbursed Disability Assistance Expense (8g) is less than the Medical/Disability Threshold (8f) • Should equal Total Annual Disability Assistance and Medical Expense (8m) if Total Annual Unreimbursed Disability Assistance Expense (8g) and Allowable Disability Expense (8j) is ≥ Medical/disability Threshold (8f)
8p.	Elderly/Disabled Allowance	Should be $400 if head, spouse or co-head is 62 or over, or disabled; otherwise it should be 0 or blank
8s.	Dependent Allowance	Must be completed if the household contains a member under age 18, disabled, or a full-time student (excluding the head, spouse, foster child or adult, or live-in attendant)

50058 Form—Consistency Errors (continued)

50058 Item		Error
8t.	Yearly Child Care Cost That Is Not Reimbursed (Child Care Allowance)	Should be completed only if any member is less than 13 years old
Family Rent and Subsidy Information		
10a.	11q, 12r, 13j, 14s TTP	Must equal TTP (9j) or blank
10a.	Through 14ag. Rent Calculations	• If Program (1c) = P: ▪ TTP (10a), must be completed ▪ Flat Rent (10b), Tenant Rent (10f), or Mixed Family Tenant Rent (10s) must be completed ▪ Sections 11 through 14 must be blank • If Program (1c) = VO or C: ▪ Section 11 or 12 must be completed ▪ Tenant Rent (11s or 12k) or Mixed Family Tenant Rent (11ak, or 12 ai) must be completed ▪ Sections 10, 13, and 14 must be blank • If Program (1c) = MR: ▪ Contract Rent to Owner must be completed ▪ Tenant Rent (13k) or Mixed Family Tenant Rent (13x) must be completed ▪ Sections 10, 11, 12, and 14 must be blank

50058 MTW Form*—Consistency Errors

50058 MTW Item		Error
General Information		
1c.	Program	Must equal P, CE, VO, or MR
2a.	Type of Action	Must equal 1 through 15
2b.	Effective Date of Action	Cannot be earlier than Date of Admission to the Program (2h)
Household Composition		
3g.	Sex	Must equal M or F
3h.	Relationship	Must equal H, S, K, F, Y, E, L, or A
3i.	Citizenship	Must equal EC, EN, IN, PV
3k.	Race	Must equal 1 through 5
3m.	Ethnicity	Must equal 1 or 2
3u.	Family Subsidy Status	Must equal C, E, F, P
3v.	Eligibility Effective Date	Should not be blank if 3u equals C
Net Family Assets and Income		
18a.	Family Member No.	Must equal a number used in Section 3. MTW Household
19a.	Family Member No.	Must equal a number used in Section 3. MTW Household
19b.	Income Code	Must equal B, F, HA, M, W, G, IW, T, P, S, SS, C, E, I, N,U, or X

*For the purpose of the study, an MTW exception was implemented if a case was flagged as using the MTW Form HUD-50058. As a result, there were 45 MTW cases (representing 11 projects) that did not use the MTW Form HUD-50058 but adhered to MTW policies. Conversely, there were 13 non-MTW cases (representing four projects) that used the MTW Form HUD-50058 and in which the MTW exception was implemented.

50059 Form—Consistency Errors

50059 Item		Error
General Information		
2.	Subsidy Type	Must equal 1 through 9
13.	Effective Date	Cannot be earlier than Date Tenant Moved into Project (16)
18.	Certification Type	Must equal 1 through 5
19.	Action Processed	Must equal 1 through 4, or blank
40.	Race of Head of Household	Must equal 1 through 4
41.	Ethnicity of Head of Household	Must equal 1 or 2
Household Composition		
39.	Sex	Must equal M or F
44.	Special Status Code	Must equal E, S, H, F, I, J, or blank; should be E if Age > 61
46.	Eligibility Code (Citizenship)	Must equal EC, EN, IC, IN, IP, PV, or XX
Net Family Assets and Income		
66. 75.	Member No.—Income Info Member No.—Asset Info	Should not be greater than the total number of members listed in item 34 (Family Member Number)
Allowances and Adjusted Income		
97.	Deduction for Dependents	Must be completed if Number of Dependents (55) is greater than 0
98. 99.	Child Care Expense (work) Child Care Expense (school)	Should only be completed if any member is less than 13 years old
102.	Disability Allowance	• Should be ≤ Disability Expenses (101) • Should be 0 if 3% of Annual Income (100) is > Total Disability Assistance Expenses (101) • Should be 0 or blank if Total Disability Expenses (101) is 0 or blank
103.	Total Medical Expenses	Should only be completed if the Special Status Code (43) for the head or spouse or co-head = H or E, or if the head, spouse, or co-head is age 62 years old or older
105.	Elderly Household Allowance	Should be $400 if the Special Status Code (43) for the head or spouse or co-head = H or E; otherwise it should be 0 or blank
Family Rent and Subsidy Information		
109.	Tenant Rent	Should equal the maximum of TTP (108) minus the Utility Allowance (32) or 0, or be blank if the Utility Reimbursement (110) > 0
110.	Utility Reimbursement	Should be blank if Item 32 < Item 108

50058 Form—Calculation Errors

50058 Item	Error Calculation
Household Composition	
3f. Age	Must equal the age calculated based on Date of Birth (3e) and Effective Date of Action (2b)
8q. Number of Dependents	Must equal the number of household members under 18, with a disability, or a full-time student (other than head, spouse co-head, foster child/adult, or live-in aide)
Net Family Assets and Income	
6f. Total Asset Value	Must equal the sum of all values in Cash Value of Asset (6d)
6i. Imputed Asset Income	Must equal Total Cash Value of Asset (6f) times the Passbook Rate (6h) if Total Value of Assets (6f) is > $5,000. If Total Value of Assets (6f) is ≤ $5,000 Imputed Asset Income (6i) = 0
6j. Income from Asset	Must equal the larger of Total Anticipated Income (6g) or Imputed Asset Income (6i)
7g. Total Non-Asset Income	Must equal the sum of all values in Income After Exclusions (7f)
7i. Total Annual Income	Must equal Final Asset Income (6j) + Total Income Other Than Assets (7g)
Allowances and Adjusted Income	
8e. Total Permissible Deductions	Must equal the sum of all values in Amount of Permissible Deduction (8d)
8f. 3% of Annual Income	Must equal 3% * Total Annual Income (8a)
8h. Disability Allowance	Must equal Total Annual Unreimbursed Disability Assistance Expense (8g) minus Medical/Disability Threshold (8f) if there is a disabled household member and an earned income greater than or equal to the disability expense
8n. Medical Allowance	Must equal: Total Annual Disability Assistance and Medical Expense (8m) minus Medical/disability Threshold (8f) if Allowable Disability Assistance Expense (8j) is blank or Total Annual Unreimbursed Disability Assistance Expense (8g) is less than Medical/disability Threshold (8f); or equal Total Annual Disability Assistance and Medical Expense (8m) if Total Annual Unreimbursed Disability Assistance Expense (8g) and Allowable Disability Assistance Expense (8j) is ≥ Medical/Disability Threshold (8f); if the head, spouse, or co-head is elderly or disabled
8p. Elderly/Disabled	Must equal $400 if head, spouse, or co-head is elderly or disabled
8s. Dependent Allowance	Must equal Number of Dependents (8q) * $480
8t. Child Care Costs	Must be 0 or blank if no household member is under age 13
8x. Total Allowance	Must equal Total Permissible Deductions (8e) + Medical / Disability Assistance Allowance (8n) + Elderly / Disability Allowance (8p) + Dependent Allowance (8s) + Total Annual Unreimbursed Childcare Costs (8t) + Total Annual Travel Cost to Work/School (8u)
8y. Adjusted Annual Income	Must equal Total Annual Income (8a) minus Total Allowances (8x)
Family Rent and Subsidy Information	
9j. Total Tenant Payment	Must equal the highest of TTP if Based on Annual Income (9c), TTP if Based on Adjusted Annual Income (9f), Welfare Rent (9g), Minimum Rent (9h), or Enhanced Voucher Minimum Rent (9i)
12p. Gross Rent	Must equal Rent to Owner (12k) + Utility Allowance (12m)
Tenant Rent (item number varies by program)	Tenant Rent must equal the recalculated tenant rent based on the Rent Calculation rules provided in Appendix A

Note: With the exception of tenant rent, negative numbers are always converted to 0

50058 MTW Form—Calculation Errors

50058 MTW Item		Error Calculation
Household Composition		
3f.	Age	Must equal the age calculated based on Date of Birth (3e) and Effective Date of Action (2b)
Net Family Assets and Income		
18f.	Total Asset Value	Must equal the sum of all values in Cash Value of Asset (18d)
18i.	Imputed Asset Income	Must equal Total Cash Value of Asset (18f) times the Passbook Rate (18h) if Total Value of Assets (18f) is > $5,000. If Total Value of Assets (18f) is ≤ $5,000 Imputed Asset Income (18i) = 0
18j.	Income from Asset	Must equal the larger of Total Anticipated Income (18g) or Imputed Asset Income (18i)
19h.	Total Non-Asset Income	Must equal the sum of all values in Income After Exclusions (19f)
19i.	Total Annual Income	Must equal Final Asset Income (18j) + Total Income Other Than Assets (19h)
Allowances and Adjusted Income		
19k.	Adjusted Annual Income	Must equal Total Annual Income (19i) minus Total Deductions (19j)
Family Rent and Subsidy Information		
21k.	Gross Rent	Must equal Rent to Owner (21i) + Utility Allowance/estimate (21j)

Note: With the exception of tenant rent, negative numbers are always converted to 0

50059 Form—Calculation Errors

50059 Item		Error Calculation
Household Composition		
48.	Age	Must equal the age calculated based on Date of Birth (42) and Effective Date of Action (13)
53.	Number of Family Members	Must equal the number of family members listed
54.	Number of Non-family Members	Must equal the number of family members listed with a relationship code of “L” or “F”
55.	Number of Dependents	Must equal the number of household members under 18, with a disability, or a full-time student (other than head, spouse co-head, foster child/adult, or live-in aide)
Net Family Assets and Income		
81.	Total Asset Value	Must equal the sum of the asset values in Cash Value of Assets (78)
82.	Actual Income From Asset	Must equal the sum of the income values in Actual Yearly Income From Assets (79)

50059 Form—Calculation Errors (continued)

50059 Item		Error Calculation
84.	Imputed Asset Income	Must equal Total Asset Value (81) * 2%, if Total Value of Assets is > $5,000
70.	Earned Income Sum	Must equal the sum of income values (in item 68) for items with codes B, F, M, or W in Income Type Code (67)
71.	Pension Income Sum	Must equal the sum of the income values (in item 68) for items with codes PE, SI, or SS in Income Type Code (67)
72.	Public Assistance Income Sum	Must equal the sum of the income values (in item 68) for items with codes TA or G in Income Type Code (67)
73.	Other Income Sum	Must equal the sum of the income values (in item 68) for items with codes CS, I, N, or U in Income Type Code (67)
74.	Total Non-Asset Income	Must equal Earned Income Sum (70) + Pension Income Sum (71) + Public Assistance Income Sum (72) + Other Income Sum (73)
85.	Asset Income	Must equal the greater of Imputed Asset Income (84) or Actual Income from Asset (82)
86.	Total Annual Income	Must equal Total Non-Asset Income (74) + Income from Asset (85)
Allowances and Adjusted Income		
97.	Dependent Allowance	Must equal Number of Dependents (55) * $480
98. 99.	Child Care Expense (work) Child Care Expense (school)	Must be 0 or blank if no household member is under age 13
100.	3% of Annual Income	Must equal Total Annual Income (86) * .03
102.	Disability Allowance	Must equal Total Disability Expenses (101) minus 3% of Annual Income (100) if there is a disabled household member and if there is earned income greater than or equal to the disability expense
104.	Medical Allowance	Must equal Total Medical Expenses (103) minus 3% of Annual Income (100) if Total Disability Expense (101) = 0; or if (Disability Deduction (102) = 0, then Medical Deduction (104) = Total Medical Expenses (103) + Total Disability Expenses (101) - 3% of Annual Income (86), if the head, spouse, or co-head is elderly or disabled
105.	Elderly Household Allowance	Must equal $400 if head, spouse, or co-head is elderly or disabled
106.	Total Allowance	Must equal Deduction for Dependents (97) + Child Care Expense Allowance (98 + 99) + Allowance for Disability Expenses (101) + Deduction for Medical Expenses (104) + Elderly Family Deduction (105)
107.	Adjusted Annual Income	Must equal Total Annual Income (86) minus Total Allowances (106)
Family Rent and Subsidy Information		
33.	Gross Rent	Must equal Contract Rent (31) + Utility Allowance (32)
108.	Total Tenant Payment	Must equal the higher of 30% of Adjusted Income (107), 10% of Total Annual Income (86), Welfare Rent (112), or $25 (Minimum Rent)
109.	Tenant Rent	Tenant Rent must equal the recalculated tenant rent based on the Rent Calculation rules provided in Appendix A

Note: With the exception of tenant rent, negative numbers are always converted to 0.

Appendix F: Project Staff Questionnaire Descriptive Analysis

APPENDIX F: PROJECT STAFF QUESTIONNAIRE DESCRIPTIVE ANALYSIS

The Project Staff Questionnaire (PSQ) was created to obtain project-level information regarding characteristics and practices that promote accurate certifications and recertifications, hereafter referred to as "recertifications," identify difficulties experienced by PHAs/projects, and uncover areas of potential improvement. The PSQ is a self-administered questionnaire sent to project managers and executive directors of PHAs/projects included in the FY 2012 study.

A. Methodology

The PSQ was administered as a Web questionnaire using a survey package called Select Survey. The content of the FY 2012 PSQ was comparable to the FY 2011 study. It consisted of a combination of open-ended and closed-ended items. In January 2013, ICF staff contacted PHAs/projects via e-mail with instructions on how to access and complete the survey. Until May 2013, we sent e-mails and made telephone calls to PHAs/projects, reminding staff to complete the PSQ survey. ICF also requested assistance from HUD on four separate occasions to encourage some of the nonresponsive PHAs/projects to complete the questionnaire. Overall, these efforts led to a response rate of 98.9 percent; 548 out of 554 PHAs/projects completed the PSQ. After the data collection, ICF staff examined the data to confirm the completeness and validity of responses. PSQs containing questionable responses or skip patterns were individually investigated and all of the data issues were resolved. Further, the PSQ was analyzed, using SPSS 20, separately for three major program types: Public Housing (199 projects), PHA-administered Section 8 (151 projects), and Owner-administered projects (198 projects).

B. Results

The results are presented in five sections.

3. **PHA/Project Staffing Topics:** This section included questions regarding the number and types of staff, staff caseload, staff turnover, minimum education, training and experience requirements for new staff, and staff development and training.
4. **Recertification Practices:** This section gathered information about timing, methods, tools and other issues related to the recertification process.
5. **Verification Processes:** This section inquired about the frequency, problems and measures taken to overcome the problems associated with the verification process.
6. **Use of Automation:** This section included topics on the capabilities of the software and utilization of computer tools by the PHA/project.
7. **Quality Control Issues:** This section asked PHA/project staff about the various aspects of quality control reviews; errors found during reviews; measures the PHAs/projects took to reduce errors; and PHA/project staff suggestions regarding ways to reduce errors in the recertification process. Specifically, topics included the types of reviews conducted to identify and rectify errors, as well as methods used to select cases for review, frequency of review, and tools and techniques used to monitor the recertification process. This

section also covered the prevalence of various kinds of errors, causes of those errors, and characteristics of households that were more likely to have errors. Additional topics included the strategies used to address and reduce various causes of errors and methods used to clarify and implement HUD policies.

1. PHA/Project Staffing Topics

Types, Numbers, and Staff Caseloads

Beginning in FY 2008, the PSQ distinguished between management companies that were able to provide information specific to a project under their management, and management companies that were not able to provide information specific to a single project within their management due to their organizational structures. In FY 2012, organizations that could not provide information specific to a project but provided information regarding their entire organization indicated that they employed an average of 58 staff members that supported an average total of 2,012 units (See Exhibit F-1a). These organizations reported an average ratio of 58 units per total staff. PHA-administered Section 8 projects had the highest ratio of units per total staff in the entire organization at 120, Owner-administered projects had the smallest ratio of 25, and Public Housing projects were in the middle with an average of 29 units per total staff in the organization.

In FY 2012, those PHAs and management companies that could provide information regarding a specific project indicated that the average PHA/project had 14 employees, including full-time, part-time, and contractual staff (See Exhibit F-1a). PHA-administered Section 8 projects had an average of 29 employees, followed by Public Housing with 13 employees, and Owner-administered projects staff with about 7 employees. On average, about 1,107 units were supported by these PHA/project staff across all three program types over a 12-month period, with an average ratio of 55 units per total staff. PHA-administered Section 8 projects had the highest ratio of units per total staff at 131, Owner-administered projects had the smallest ratio of 26, and Public Housing projects were in the middle with an average of 33 units per total staff.

In addition to gathering information about the number of staff employed at the organization and PHA/project, the PSQ gathered information from the recertification staff members who interview the tenants regarding rent calculation, verification tracking, and supervising other staff in performing move-in certifications and annual recertifications at a PHA/project. In FY 2012, the average PHA/project had 6 recertification staff members who were each assigned 225 cases across all three program types over a 12-month period (See Exhibit F-1a). PHA-administered Section 8 projects had the highest average recertification caseload at 345 cases per staff person; Owner-administered projects had the smallest average with 126 cases; and Public Housing projects were in the middle with on average 232 cases per staff member.

Exhibit F-1a: Average Number of Staff and Caseload of Staff, by Program Type

Average Number of Staff and Average Caseload of Staff	Program Type			Total
	Public Housing	PHA-Administered Section 8	Owner-Administered	
Entire Organizations				
Total Number of Staff an Entire Organization Employs, Including Full-Time, Part-Time and Contractual	63.9	48.9	62.6	58.3
The Total Number of Assisted Units Supported by These Staff	1,830.6	3,291.3	872.9	2,011.8
Units Per Entire Organization Staff Ratio	28.7	120.3	24.8	57.9
Individual Projects				
Total Number of Staff an Individual Project Employs, Including Full-Time, Part-Time and Contractual	13.1	28.5	6.7	14.4
The Total Number of Assisted Units Supported by These Staff	396.6	3,653.8	149.3	1,106.6
Units Per Individual Project Staff Ratio	32.9	131.0	25.7	55.0
Entire Organizations and Individual Projects				
Number of Staff That Work on Recertification or Verification Tasks at the PHA/Project	3.7	12.8	2.9	6.0
The Number of Cases Assigned to Each Recertification Staff Member Over a 12-Month Period	231.9	344.9	125.7	225.2

Note: Averages were calculated based on the number of PHAs/projects that responded to the specific items.

New Staff, Experienced Staff, and Staff Turnover

The PSQ also collected information about the number of new and experienced staff assigned to conduct recertifications. New staff was defined as staff that were hired to conduct recertifications, or existing staff that were reassigned to recertification tasks in the past 12 months. Forty-eight percent of the PHAs/projects indicated that they assigned new staff to the recertification tasks in the past 12 months and had an average number of two new staff within these PHAs/projects (See Exhibit F-1b). PHAs/projects also reported that the average number of experienced staff conducting recertifications was about five. Among experienced staff, PHAs/projects reported that, on average, more than half of the staff had 10 or more years of experience (58%) or had 4 or fewer years of experience (56%). Less than half of experienced staff at the PHAs/projects surveyed were composed of staff with 5 to 9 years of experience (48%). With respect to the program type, PHA-administered Section 8 projects were the most likely to have reported hiring new recertification staff (60%), and hired the largest number of new recertification staff (4) (See Exhibit F-1b). Conversely, Owner-administered projects were the least likely to report hiring these types of staff. Approximately 43 percent reported hiring new recertification staff and hiring one individual, on average, in the past 12 months. Owner-administered projects were also slightly more likely to have experienced staff with 4 or fewer years of experience (61%), while Public Housing projects were slightly more likely to have experienced staff with 5 to 9 years of experience (53%). Interestingly, Owner-administered projects and Public Housing projects were equally likely to have experienced staff with at least 10 years of experience (59%).

Exhibit F-1b: Average Number of New and Experienced Staff, by Program Type

New and Experienced Staff	Program Type			Total
	Public Housing	PHA-Administered Section 8	Owner-Administered	
PHA/Projects with New Recertification Staff Added in the Past 12 Months	44.2%	60.3%	43.4%	48.4%
Average Number of New Staff Assigned to Conduct Recertifications	1.5	3.5	1.4	2.2
Average Number of Experienced Staff Assigned to Conduct Recertifications	3.5	10.9	2.7	5.4
Average Percentage of Experienced Staff with 4 or Fewer Years of Experience*	57.6%	49.0%	61.2%	56.0%
Average Percentage of Experienced Staff with 5 or 9 Years of Experience*	52.9%	42.3%	49.1%	48.3%
Average Percentage of Experienced Staff with 10 or More Years of Experience*	58.9%	55.5%	58.9%	57.8%

Note: Averages and percentages were calculated based on the PHAs/projects that responded to the specific items.
* Percentages were calculated based on PHAs/projects that had experienced staff.

In addition to new and experienced staff, PHAs/projects were also asked about staff turnover. Thirty-seven percent of PHAs/projects in the study indicated that they had staff turnover of at least one member in the past 12 months (See Exhibit F-1c). For these PHAs/projects, staff turnover averaged two recertification staff in the previous 12 months. Those PHAs/projects that experienced staff turnover in the past 12 months were then asked to describe the reasons for their staff leaving. The most common reason was resignation due to better opportunity, career change, or relocation (32%) (See Exhibit F-1c). Twenty percent of the PHAs/projects reported they had staff turnover due to interagency or interdepartmental transfer, while 16 percent reported work performance-related termination. A minority of PHAs/projects reported staff turnover due to resignation for personal reasons (10%), retirement (9%), promotion (5%) or budget and management (3%).

Regarding program type, PHA-administered Section 8 projects were most likely to have recertification staff turnover in the previous 12 months (52%) and to report the largest turnover of recertification staff (2) (See Exhibit F-1c). PHA-administered Section-8 projects were most likely to report resignation due to a better opportunity, career change, or relocation (40%), retirement (15%), or budget and management (7%) as reasons for staff turnover. Meanwhile, Owner-administered projects were most likely to cite work performance-related termination or resignation for personal reasons as explanations for staff turnover (22% and 13%, respectively), and Public Housing projects were most likely to report interagency or interdepartmental transfer or promotions (38% and 9%, respectively). Interestingly, neither Public Housing nor Owner-administered projects reported budget or management as issues leading to staff turnover.

Exhibit F-1c: Staff Turnover and Reasons for Staff Turnover, by Program Type

Characteristic	Program Type			Total
	Public Housing	PHA-Administered Section 8	Owner-Administered	
The PHA/Projects with Recertification Staff Who Left the PHA/Project	29.9%	51.7%	33.0%	37.0%
Average Number of Recertification Staff Who Left the PHA/Project	1.5	2.4	1.9	2.0
Resignation Due to Better Opportunity, Career Changes, or Relocation*	17.2%	40.0%	34.9%	31.6%
Interagency or Interdepartmental Transfer*	37.9%	9.3%	17.5%	20.4%
Termination Due to Work Performance-Related Problems*	12.1%	14.7%	22.2%	16.3%
Resignation Due to Personal Reasons*	6.9%	10.7%	12.7%	10.2%
Retirement*	6.9%	14.7%	4.8%	9.2%
Promotion*	8.6%	1.3%	6.3%	5.1%
Budget and Management (e.g., Layoffs, Budget Cuts, New Management)*	0.0%	6.7%	0.0%	2.6%

Note: Averages and percentages were calculated based on the PHAs/projects that responded to the specific items.
* Percentages were calculated based on the PHAs/projects that had staff turnover.

Education, Training, and Experience Requirements for Staff Working With Recertifications

The minimum education requirements for employees working with recertifications changed slightly from the previous years. Sixty-two percent of PHAs/projects required at least a high school diploma or equivalent when hiring new staff who will be working with recertifications, compared to 66 percent in both FY 2011 and FY 2010 (See Exhibit F-1d). The percentage of PHAs/projects that required a 2-year college degree, however, increased to 19 percent from 16 percent in both FY 2011 and FY 2010. Only about four percent of PHAs/projects did not require any education. With respect to the program type, the Owner-administered projects were the most likely to not require any education (about 9%) and were also the least likely to require a 2-year college degree (13%) or a 4-year college degree (6%). Conversely, Public Housing projects were most likely to have an education requirement (<1% with no minimum requirement), while PHA-administered Section 8 projects were the most likely to require a 2-year degree (29%) or a 4-year degree (13%).

Exhibit F-1d: Minimum Education Requirements for New Employees Working With Recertifications, by Program Type

Minimum Education Requirements	Program Type			Total
	Public Housing	PHA-Administered Section 8	Owner-Administered	
No Minimum Requirements	0.5%	2.0%	8.8%	3.9%
High School/GED	65.8%	52.0%	66.5%	62.2%
2-Year College Degree or Commensurate Experience	18.7%	28.7%	12.9%	19.4%
Bachelor's Degree	9.8%	12.7%	5.7%	9.1%
Other	5.2%	4.7%	6.2%	5.4%

Note: Averages were calculated based on the PHAs/projects that responded to the items.

In addition to minimum education requirements, PHAs/projects also had other requirements for employees working with recertifications. The majority of PHAs/projects required background checks (70%) or other housing-related experience (51%) (See Exhibit F-1e). Special housing-related training such as Nan McKay (NMA) or NCHM was required by less than half of the PHAs/projects (43%), as was a special housing-related certification such as Certification Occupancy Specialist (COS) or National Affordable Housing Professional (NAHP) (38%). Only three percent of PHAs/projects reported not having any training, experience, or qualification requirements. The Owner-administered projects were the least likely to require special housing-related training (32%) and were the most likely to rely on special housing-related certifications (58%). Conversely, PHA-administered, Section 8 projects were the least likely to require special housing-related certification (21%) and were most likely to rely on special housing-related training (51%). Public Housing projects were in the middle for requiring special-housing related training (48%), and special housing-related certification (32%).

Exhibit F-1e: Housing-Related Training and Experience Requirements for Employees Working With Recertifications, by Program Type

Training and Experience Requirements	Program Type			Total
	Public Housing	PHA-Administered Section 8	Owner-Administered	
Background Checks such as Valid Driver's License, Credit Checks, Criminal History, or Drug Testing	63.3%	69.5%	77.3%	70.1%
Other Housing-Related Experience	46.7%	51.7%	54.0%	50.7%
Special Housing-Related Training, such as Nan McKay (NMA) or NCHM	48.2%	51.0%	31.8%	43.1%
Special Housing-Related Certification	31.7%	20.5%	58.1%	38.1%
None	2.5%	2.6%	2.5%	2.6%

Note: Percentages were calculated based on the PHAs/projects with training and experience requirements.

The basic skills that the vast majority of the PHAs/projects required for employees working with recertifications included computer skills (90%), customer service and communication skills (88%), math and logic skills (87%), and administrative or clerical skills (77%) (See Exhibit F-1f). Case management skills were required by less than half of the PHAs/projects (44%). Overall, few PHAs/projects (2%) reported no skill requirements for employees. The biggest

differences in basic skill requirements between program types involved case management skills and administrative or clerical skills. PHA-administered Section 8 projects were less likely to require administrative or clerical skills (62%), while Owner-administered projects were less likely to require case management skills (30%). Furthermore, Public Housing projects were slightly more likely not to require any skills (2%).

Exhibit F-1f: Other Basic Skills Required for Employees Working With Recertifications, by Program Type

Basic Skills Required	Program Type			Total
	Public Housing	PHA-Administered Section 8	Owner-Administered	
Computer Skills	89.9%	87.4%	91.9%	90.0%
Customer Service and Communication Skills	87.9%	87.4%	87.4%	87.6%
Basic Math or Logic Skills	87.9%	88.7%	84.3%	86.9%
Administrative or Clerical Skills	80.4%	62.3%	84.3%	76.8%
Case Management Skills	49.2%	55.6%	29.8%	44.0%
None	2.0%	1.3%	1.5%	1.6%

Note: Percentages were calculated based on the number of PHAs/projects with basic skills requirements.

Staff Development and Training

The PSQ collected information about the amount and type of training provided to new and experienced recertification staff in the previous 12 months. The average number of hours of training received by each newly hired recertification staff member decreased from previous years to 82 hours (See Exhibit F-1g), compared to 130 hours on average in FY 2011 and 101 hours in FY 2010. Also, while PHAs/projects historically provided a comparable amount of training to both re-assigned staff and experienced staff (49 hours and 45 hours in FY 2011, respectively, and 69 hours for both groups in FY 2010), in FY 2012 PHAs/projects provided more training for their re-assigned staff (47 hours) than their experienced staff (31 hours). Owner-administered projects provided the least amount of training to their new, re-assigned, and experienced staff (47 hours, 29 hours, and 26 hours, respectively), while PHA-administered Section 8 projects provided the most training to all three groups (124 hours, 69 hours, and 36 hours).

Exhibit F-1g: Average Number of Training Hours, by Program Type

Training Types	Program Type			Total
	Public Housing	PHA-Administered Section 8	Owner-Administered	
Average Number of Training Hours Received by Each New Recertification Staff	69.8	123.6	47.2	82.1
Average Number of Training Hours Received by Each Staff Re-Assigned Within the Last 12 Months	35.3	68.9	28.6	46.9
Average Number of Training Hours Received by Each Experienced Recertification Staff	33.2	36.3	25.8	31.2

Note: Averages were calculated based on the PHAs/projects that responded to the specific items.

With respect to the frequency of training experienced recertification staff on new policies, new procedures, or new quality control operations, the vast majority of PHAs/projects (84%) reported always or frequently conducting the training, with the majority (56%) indicating frequently conducting the training (See Exhibit F-1h). Few PHAs/projects acknowledged that they did not conduct any training of experienced staff (about 2%). The Owner-administered projects were slightly more likely to report always or frequently training their experienced recertification staff (88%), while Public Housing projects were the least likely to acknowledge always or frequently conducting training (80%), and were the most likely to report rarely training experienced staff (18%).

Exhibit F-1h: Frequency of Training Experienced Staff, by Program Type

Frequency of Training Experienced Staff	Program Type			Total
	Public Housing	PHA-Administered Section 8	Owner-Administered	
Never	2.1%	0.7%	1.5%	1.5%
Rarely	17.5%	15.3%	10.7%	14.4%
Frequently	55.7%	54.7%	56.3%	55.6%
Always	24.7%	29.3%	31.5%	28.5%
Total: Frequently or Always	80.4%	84.0%	87.8%	84.1%

Note: Percentages were calculated based on the PHAs/projects with training for experienced staff.

The 84 percent of PHAs/projects that frequently or always conducted the training of experienced recertification staff were then asked to rank order the three training methods that they have used most frequently. The ranks of these top three methods were combined to calculate the total percentage of PHAs/projects that have used the various methods. At least half of the PHAs/projects rated the following methods to train experienced recertification staff as the three most frequent methods: self-training through manuals, videos, or informal questions (63%), working with other experienced staff one-on-one while conducting recertifications (56%), and training sessions with the supervisor (55%) (See Exhibit F-1i). Attending specialized training conducted by an outside organization and using tele-course or Internet/Web-based training were methods of training reported by less than half of the PHAs/projects (49% and 46%, respectively). Compared to FY 2011, there was an increase in both one-on-one work with other experienced staff and supervisor-held training sessions as methods to train experienced staff (52% and 51% in FY 2011,

respectively). At the same time, a requirement for specialized training conducted by an outside organization decreased between years (58% in FY 2011). The extent to which PHAs/projects relied on the other training methods for experienced staff remained relatively stable from FY 2011 to FY 2012.

In FY 2012, Owner-administered projects were most likely to have experienced staff attend specialized training conducted by an outside organization (64%), and least likely to use any of the other methods of training (See Exhibit F-1i). Conversely, PHA-administered Section 8 projects were most likely to require employees to read the HUD/PHA/owner manual, watch videos, or ask informal questions (71%), to attend senior staff held training sessions (60%), and to participate in tele-course or Internet/Web-based training (51%). Public Housing projects were most likely to have employees work one-on-one with other experienced staff while conducting recertifications (61%).

Exhibit F-1i: Methods Used to Train Experienced Recertification Staff, by Program Type

Methods Used to Train Experienced Recertification Staff	Program Type			Total
	Public Housing	PHA-Administered Section 8	Owner-Administered	
Read HUD/PHA/Owner Manual, Watched Videos, or Asked Informal Questions	65.4%	71.4%	53.3%	62.5%
Worked One-On-One With Other Experienced Staff During the Conduct of Recertifications	60.9%	56.3%	50.3%	55.7%
Supervisor/Senior Staff Held Training Sessions With Experienced Staff Explaining Procedures	57.7%	59.5%	50.3%	55.4%
Attended Specialized Training Conducted by an Outside Organization (e.g., HUD, NAHRO)	39.7%	42.1%	63.9%	49.4%
Participated in Tele-course or Internet/Web-Based Training (e.g., Webcasts, Webinars)	49.4%	50.8%	39.1%	45.9%

Note: Percentages were calculated for PHAs/projects that frequently or always provided training to experienced staff.

PHAs/projects were also asked to rank order the top three methods they used most frequently to train their new recertification staff. The ranks of the top three methods were combined to calculate the total percentage of PHAs/projects that have used the various methods. The methods that at least half of the PHAs/projects rated as the three most frequently used to train new recertification staff were comparable to FY 2011. They included working one-on-one with experienced staff (81%), and self-training through manuals, videos, or informal questions (54%) (See Exhibit F-1j). Less than half of the PHAs/projects reported using supervisor/senior staff training sessions (48%), specialized training conducted by an outside organization (48%), and tele-course or Internet/Web-based training (35%) as methods of training new recertification staff.

With respect to program type, PHA-administered Section 8 projects were most likely to have new staff work one-one with experienced staff (86%), attend specialized training conducted by any outside organization (53%), and attend supervisor/senior-staff held training sessions (49%) (See Exhibit F-1j). Public Housing projects were most likely to rely on HUD/PHA/owner manuals, videos, or informal questions (62%) and tele-course or Internet/Web-based training (36%) to train new recertification staff. Conversely, Owner-administered projects were less likely to report using HUD/PHA/owner manuals, videos, or informal questions (48%), specialized training conducted by

any outside organization (45%), and tele-course or Internet/Web-based training (33%) as tools to train new recertification staff.

Exhibit F-1j: Most Frequently Used New Recertification Staff Training Methods, by Program Type

Methods Used for Training New Recertification Staff	Program Type			Total
	Public Housing	PHA-Administered Section 8	Owner-Administered	
New Staff Worked One-On-One With Experienced Staff to Conduct Recertifications	70.7%	85.7%	84.5%	80.6%
Read HUD/PHA/Owner Manual, Watched Videos, or Asked Informal Questions	62.1%	51.4%	48.3%	53.8%
Held Training Sessions for Supervisor/Senior Staff to Explain Procedures to New Staff	46.6%	48.6%	48.3%	47.8%
Attended Specialized Training Conducted by an Outside Organization (e.g., HUD, NAHRO)	44.8%	52.9%	44.8%	47.8%
Participated in Tele-course or Internet/Web-Based Training (e.g., Webcasts, Webinars)	36.2%	35.7%	32.8%	34.9%

Note: Percentages were calculated for PHAs/projects that reported conducting training of new recertification staff in the past 12 months.

The PSQ also collected qualitative data about the skills or trainings that the PHAs/projects believe would be the most effective for staff who conduct recertifications. Of the PHAs/projects that provided suggestions for skills and training curricula, the most common responses were that staff needed skills and training in knowledge of PHA and HUD policies (58%); rent, income, and expense calculations (37%); customer service, communication, and interview skills (34%); in addition to general office skills (29%) (See Exhibit F-1k). With respect to program type, Owner-administered projects were most likely to suggest training on PHA and HUD policies (65%), while PHA-administered Section 8 projects were most likely to suggest rent calculation training (49%), customer service and communication skills (43%), and general office skills (36%).

Exhibit F-1k: Training and Skills Suggested for Recertification Staff, by Program Type

Characteristic	Program Type			Total
	Public Housing	PHA-Administered Section 8	Owner-Administered	
PHA and HUD Policies	50.0%	60.2%	64.5%	58.1%
Rent Calculation Including Income, Expense Calculations	45.8%	49.2%	18.4%	37.2%
Customer Service, People, Communication, Language, and Interview Skills	36.8%	43.2%	23.4%	34.0%
General Office Skills: Detail Oriented, Organizational, Time Management, and Math/Bookkeeping Skills	25.0%	35.6%	26.2%	28.5%
EIV Training	18.1%	7.6%	16.3%	14.4%
Verification Process	13.2%	9.3%	12.1%	11.7%
General Computer Skills	6.9%	13.6%	6.4%	8.7%
Other Training Topics	6.3%	6.8%	5.7%	6.2%

Note: Percentages were calculated for PHAs/projects that had suggestions regarding the recertification skills or trainings.

2. The Recertification Process

Time Allowed for the Recertification Process

Regarding the recertification process timeline, PHAs/projects were asked to submit the number of days prior to the effective date that they started conducting certain recertification tasks. An analysis of the submissions showed that results were comparable to previous years. On average, the PHAs/projects mailed letters to the tenants advising them of upcoming recertifications 105 days prior to the recertification. The PHAs/projects conducted household interviews an average of 81 days prior to the recertification; requested third-party verification an average of 77 days prior to the recertification; and calculated rent 54 days prior to the recertification effective date (See Exhibit F-2a). Exhibit F-2b expands upon these averages and shows the distribution of time for each of these tasks by program type. Owner-administered projects were predominantly likely to mail letters to tenants more than 90 days prior to the next effective date and were, in general, more likely to begin interviewing the household sooner than Public Housing and PHA-administered Section 9 projects.

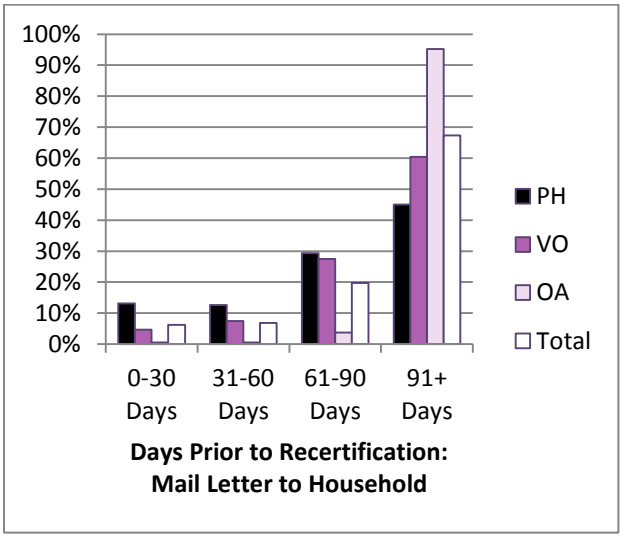
Exhibit F-2a: Average Number of Days Prior to the Effective Date Recertification Tasks are Performed, by Program Type

Tasks Performed Prior to the Effective Date of Recertification	Program Type			Total
	Public Housing	PHA-Administered Section 8	Owner-Administered	
Mail Letter to Household Advising It of an Upcoming Annual Review	91.9	103.9	119.4	105.1
Interview Household Member	74.2	72.9	92.0	80.7
Request/Obtain Verification From Third Parties	68.6	74.7	87.7	77.3
Calculate the Rent	52.5	46.9	60.1	53.6

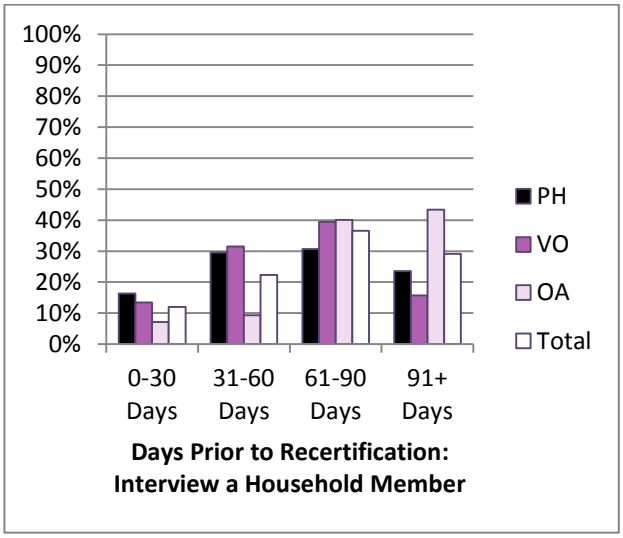
Note: Averages were calculated based on the PHAs/projects that responded to the specific items.

Exhibit F-2b: Number of Days Preceding the Effective Date That an Action Is Taken, by Program Type
(PH = Public Housing, VO = PHA-administered Section 8, OA = Owner-administered)

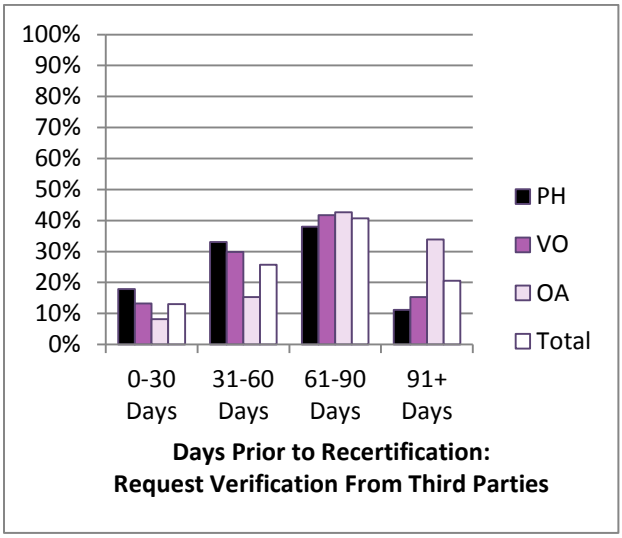
Mail Letter to Household



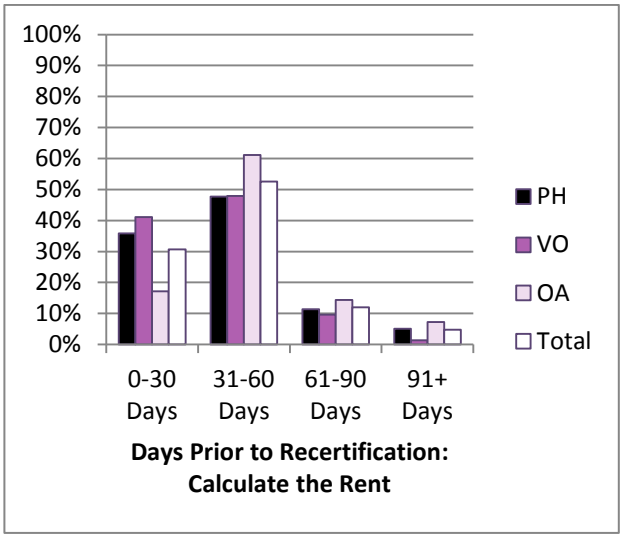
Interview a Household Member



Request Verification From Third Parties



Calculate the Rent



Note: Data presented in figures were calculated based on the PHAs/projects that responded to the specific items.

Methods Used to Gather Information for the Recertification Process

The PSQ additionally gathered data about the methods used by PHAs/projects to obtain household information to conduct recertifications. An analysis of the answers submitted indicated that when conducting move-in/initial certifications, PHAs/projects were most likely to obtain household information by conducting an in-person interview (for an average of 90% of the certifications) and were less likely use a form (50% of the cases) or to conduct a telephone interview (8% of the cases) (See Exhibit F-2c). Also, in order to gather complete information to conduct annual recertifications, PHAs/projects were most likely to conduct in-person interviews (for an average of 86% of the cases) and were much less likely to use a form or conduct telephone interviews (54%

and 6% of cases, respectively). This is a sharp shift from FY 2011, where telephone interviews were the dominant mode of collecting household information for move-in/initial certifications (91% of cases), and forms were the dominant mode for annual recertifications (85% of cases). Interestingly, with respect to program type, Owner-administered projects were most likely to conduct in-person interviews for both move-in/initial certifications and annual recertifications (97% of cases, each).

Exhibit F-2c: Average Percent of Cases for Which Methods Were Used to Obtain Household Information for Recertifications, by Program Type

Methods Used to Obtain Household Information for Recertifications	Program Type			Total
	Public Housing	PHA-Administered Section 8	Owner-Administered	
Move-In/Initial Certifications				
Conduct an In-Person Interview	86.7%	86.4%	96.6%	90.2%
Have the Tenant Complete a Form and Return it Via Mail, Drop Box in the Office, or In-Person	47.6%	53.0%	47.1%	49.0%
Conduct a Telephone Interview	6.4%	9.6%	9.6%	8.4%
Annual Recertifications				
Conduct an In-Person Interview	83.8%	75.5%	96.5%	86.3%
Have the Tenant Complete a Form and Return it Via Mail, Drop Box in the Office, or In-Person	55.0%	58.2%	49.7%	54.3%
Conduct a Telephone Interview	5.6%	7.1%	6.0%	6.2%

Note: Averages were calculated based on the number of PHAs/projects that responded to the specific items.

Tools Used to Gather Information in the Recertification Process

About 87 percent of the PHAs/projects that completed the PSQ used a formal guide or a set of questions to conduct recertification interviews (See Exhibit F-2d). These PHAs/projects were then asked to distinguish the various types of formal guides they used when interviewing tenants. The PHAs/projects that used a formal guide or a set of questions were more likely to use questionnaires developed in house (67%), or use their own checklists (52%), compared to only 12 percent that used questionnaires developed by a third-party vendor.

The Owner-administered projects were the most likely to use a formal guide (93%), whereas Public Housing projects were the least likely to do so (82%) (See Exhibit F-2d). The Owner-administered projects were the least likely to use their own questionnaires (58%) and were the most likely to use their own checklists (54%) or to rely on questionnaires created by vendors. (18%). Conversely, PHA-administered Section 8 projects were the most likely to use their own questionnaires (74%) and were the least likely to rely on vendors (8%). Public Housing projects were the least likely to use their own checklists (50%).

Exhibit F-2d: Use and Types of Formal Guides When Interviewing Tenants, by Program Type

Use and Types of Formal Guides	Program Type			Total
	Public Housing	PHA-Administered Section 8	Owner-Administered	
Formal Guide or Set of Questions Used to Interview Tenants During the Recertification Process	82.4%	85.5%	92.7%	87.0%
Type of Formal Guide: Questionnaire Developed Specifically by the PHA/Project*	73.0%	74.2%	57.6%	67.4%
Type of Formal Guide: Checklist Developed by the PHA/Project*	49.7%	53.2%	54.2%	52.4%
Type of Formal Guide: Questionnaire Developed by a Vendor*	8.2%	8.1%	17.5%	11.7%

Note: Percentages were calculated based on the PHAs/projects that responded to the specific items.
* Percentages were calculated for PHAs/projects that used formal guide or set of questions.

Methods Used to Recertify Households With Non-English-Speaking Tenants

The majority of PHAs/projects (65%) reported renting to tenants who spoke a language other than English as their primary language (See Exhibit F-2e). Within these PHAs/projects, about 28 percent of the tenant population spoke a language other than English as their primary language. Additionally, there are two interesting findings regarding non-English speaking tenants. First, the findings suggest a sharp contrast by program type, where only 53 percent of the Owner-administered projects reported renting to non-English speaking tenants, compared with 83 percent of the PHA-administered Section 8 projects. The second interesting finding involves the proportion of non-English speaking tenants within program types. The Owner-administered projects with non-English speaking tenants indicated that 33 percent of their population was non-English speaking, whereas the PHA-administered Section 8 projects with non-English speaking tenants reported that only 18 percent of their tenants were non-English speaking. So, while it seems the proportion of projects with non-English speaking households is higher in PHA-administered Section 8 projects, non-English speaking tenants are actually more clustered together in Owner-administered than in PHA-Administered Section 8 projects.

The PHAs/projects that provided assistance to tenants who spoke a language other than English used a combination of methods to communicate with them during the recertification process. These PHAs/projects were most likely to rely on tenants to bring their own translators (73%), followed by using bi-lingual staff (69%), using translated forms (56%), or using third-party translators (53%) (See Exhibit F-2e). The Owner-administered projects were least likely to use bi-lingual staff (63%) or third-party translators (41%), and were more likely to rely on tenants' translators (78%). PHA-administered Section 8 projects were the most likely to rely on bi-lingual staff (76%) or third-party translators (64%), while Public Housing projects were least likely to use tenants' translators (68%) or translated forms (53%).

Exhibit F-2e: Prevalence of Tenants Who Speak Language Other Than English as Their Primary Language, and Methods Used to Communicate With Them, by Program Type

Tenants Who Speak Language Other Than English and Methods Used to Communicate With Them	Program Type			Total
	Public Housing	PHA-Administered Section 8	Owner-Administered	
Percentage of PHA/Projects With Tenants Who Speak a Language Other Than English as Their Primary Language	63.0%	83.4%	53.3%	65.2%
Average Percentage of Tenants Who Speak a Language Other Than English*	34.0%	18.4%	32.7%	28.1%
Methods of Communication: Use Translators Brought by Tenants Themselves*	67.8%	73.0%	77.9%	72.6%
Methods of Communication: Use Bilingual Project Staff*	66.1%	76.2%	62.5%	68.7%
Methods of Communication: Use Forms Written in a Language Other Than English*	52.9%	61.1%	54.8%	56.4%
Methods of Communication: Use Translators Provided by PHA/Project (Third-Party Translators)*	52.9%	63.5%	41.3%	53.3%

* Averages and percentages were calculated for PHAs/projects that had non-English speaking tenants.

3. The Verification Process

Frequency of Verifications

The PSQ collected information on the frequency of verification requests to confirm various incomes, expenses, and other household characteristics during the past 12 months. PHAs/projects were asked whether these items were verified only during move-in certifications, only during annual recertifications, during both move-in/initial and annual recertifications, or during neither certification type. In general, virtually all of the PHAs/projects (at least 96%) indicated that they verify all of the listed items while processing either move-in or annual recertifications.

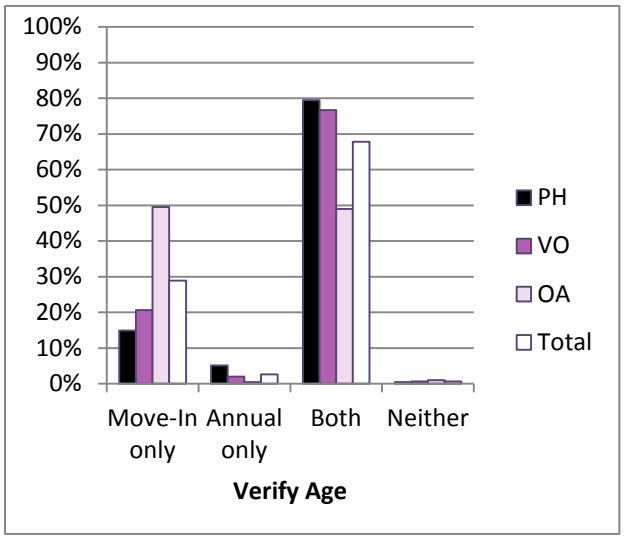
With respect to the timing of requesting verification from third-parties, most of the household characteristics, incomes, and expenses that were reported have been verified during both move-in and annual recertifications by at least 91 percent of the PHAs/projects. The only items that were verified during both move-in and annual recertifications at a lower rate among PHAs/projects were some of the household characteristics (See Exhibit F-3a). It is logical that PHAs/projects were less likely to verify static information such as date of birth, social security numbers, citizenship, and disability information during subsequent annual recertifications. However, even for these items, the majority of PHAs/projects reported requesting verification during both move-in certifications and annual recertifications (68% for age, 57% for SSNs, and 81% for disability). Citizenship status was the singular item verified during move-in certifications only by the majority of PHAs/projects (52%). Interestingly, all income items (employment income, sporadic/seasonal/infrequent income, TANF/welfare benefits, Social Security benefits, child support payments, and other income sources) and all expense items (medical expenses, child care expenses, and disability expenses) had comparable distributions across the variable verification timing, allowing the distributions to be combined (See Exhibit F-3b).

Differences in verification practices between the three program types occurred for household characteristics, incomes, and expenses. Owner-administered projects were slightly more likely to

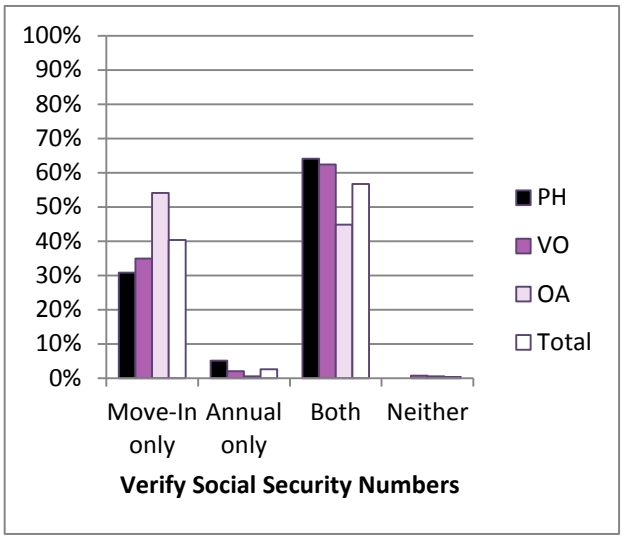
verify household characteristics only during move-in certifications, while Public Housing projects were slightly more likely to verify these household characteristics only during annual recertifications (See Exhibit F-3a). Public Housing projects were also most likely to verify incomes and expenses only during annual recertifications and least likely to verify these items during both move-in and annual recertifications (See Exhibit F-3b).

Exhibit F-3a: Frequency of Verification of Household Composition Items While Processing Recertifications, by Program Type
(PH = Public Housing, VO = PHA-Administered Section 8, OA = Owner-administered)

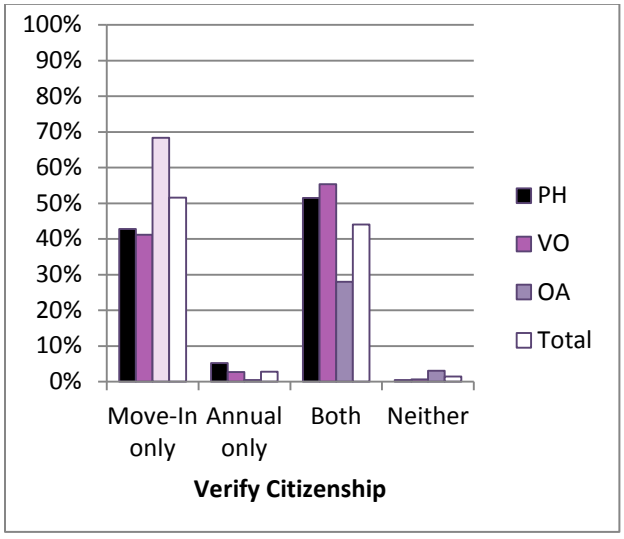
Verification of Age



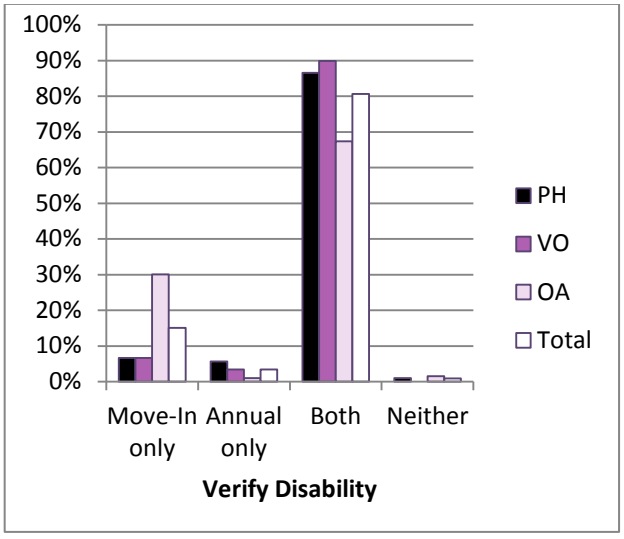
Verification of Social Security Numbers



Verification of Citizenship



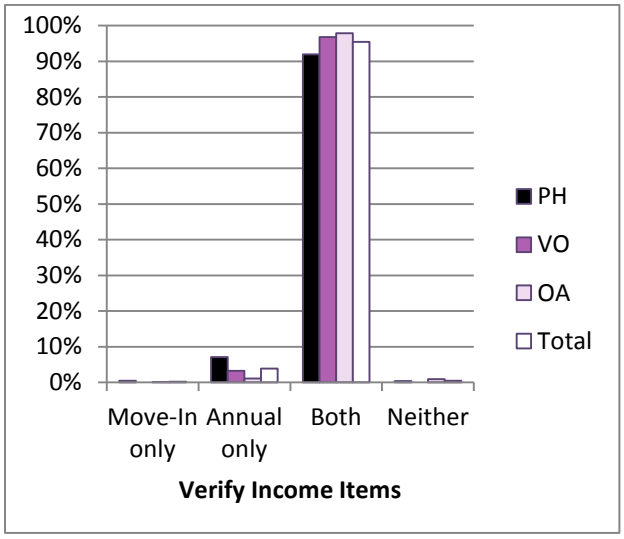
Verification of Disability



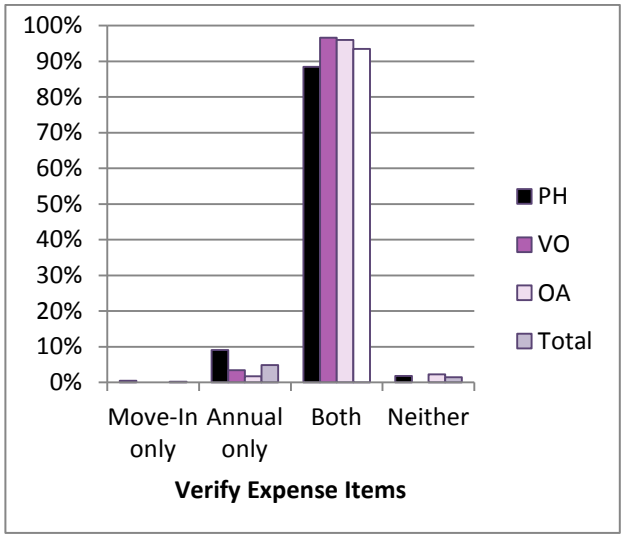
Note: Data presented in figures were calculated based on the PHAs/projects that responded to the specific items.

Exhibit F-3b: Frequency of Verification of Income and Expense Items While Processing Recertifications, by Program Type
(PH = Public Housing, VO = PHA-Administered Section 8, OA = Owner-administered)

Verification of Income Items



Verification of Expense Items



Note: Data presented in figures were calculated based on the PHAs/projects that responded to the specific items.

Problems in Obtaining Complete Verification

PHAs/projects were asked to rank order the top three issues they encountered in obtaining complete verifications. The ranks of the top three issues were combined to calculate the total percentage of all PHAs/projects that have encountered the various issues. The issues ranked by all PHAs/projects as the three most frequently encountered were: tenants providing incomplete or inaccurate third-party contact information (76%); followed by employers not responding to requests in timely manner (74%); other institutions not responding in a timely manner (64%); and employers not providing all requested information (46%) (See Exhibit F-3c). The other issues, including the failure of housing staff to follow up when verification is not received as requested and insufficient staffing to complete all of the verification procedures, were each endorsed by less than 10 percent of surveyed PHAs/projects.

With respect to program type, Owner-administered projects were the most likely to report other institutions not responding in a timely manner as an obstacle to obtaining complete verifications (78%), and were the least likely to acknowledge the other issues in obtaining complete verifications (See Exhibit F-3c). The Public Housing projects, conversely, were most likely to report that employers did not respond in a timely manner (81%) and experienced an inadequate number of staff to complete all verification procedures (13%) as problems in obtaining complete verification. Meanwhile, PHA-administered Section 8 projects were slightly more likely to report issues that included tenants providing incomplete or inaccurate information and employers failing to provide all requested information as problems that prevented staff from obtaining complete verification (79% and 49%, respectively).

Exhibit F-3c: Causes of Problems in Obtaining Complete Verifications, by Program Type

Issues That Caused Problems in Obtaining Complete Verifications	Program Type			Total
	Public Housing	PHA-Administered Section 8	Owner-Administered	
Tenants Providing Incomplete or Inaccurate Third-Party Contact Information	78.6%	78.7%	69.0%	75.2%
Employers Not Responding to Requests in a Timely Manner	80.7%	74.0%	67.4%	74.1%
Other Institutions (e.g., Banks, TANF Agency) Not Responding in a Timely Manner	54.7%	57.3%	78.1%	63.7%
Employers Not Providing All Requested Information	43.2%	48.7%	46.0%	45.7%
Housing Staff Not Following Up When Verification Is Not Received as Requested	12.0%	12.0%	5.3%	9.6%
Not Having Enough Staff to Complete All Verification Procedures	13.0%	12.7%	3.2%	9.5%

Note: Percentages were calculated based on the PHAs/projects that reported causes of problems in obtaining complete verification.

Cooperativeness of Various Institutions in Verifying Tenant Information

PHAs/projects were asked to rank order the three groups that were the least cooperative in providing verification information in the past 12 months. The ranks of these top three groups were combined to calculate the total percentage of all PHAs/projects that have encountered various uncooperative groups. The types of groups that were rated as uncooperative during the verification process included: employers (60%), tenants (54%), financial institutions (51%), health care providers (40%), social services (32%), insurance companies (23%), and educational institutions (19%) (See Exhibit F-3d).

Public Housing projects were the most likely to view employers, tenants, and social services as uncooperative (72%, 69%, and 33%, respectively), but were the least likely to report other institutions as being uncooperative during the verification process (See Exhibit F-3d). Conversely, the Owner-administered projects were the most likely to view financial institutions, health care providers and insurance companies as uncooperative (68%, 46%, and 39%, respectively), while less likely to view the other groups as uncooperative during the verification process. PHA-administered Section 8 projects were most likely to view educational institutions as uncooperative when verification was requested (28%).

Exhibit F-3d: Groups and Institution Types That Were Not Cooperative When Verification Information Was Requested, by Program Type

Non-Cooperative Groups and Institutions	Program Type			Total
	Public Housing	PHA-Administered Section 8	Owner-Administered	
Employers	72.3%	60.1%	46.2%	59.7%
Tenants	68.6%	56.8%	37.4%	54.3%
Financial Institutions (e.g., Banks, Investment Firms)	38.2%	48.0%	68.1%	51.4%
Health Care Providers (e.g., Doctors, Pharmacies)	35.1%	37.8%	45.6%	39.5%
Social Services (e.g., TANF, SNAP, Child Support Enforcement)	33.0%	31.1%	30.8%	31.7%
Insurance Companies (e.g., Health Insurance)	13.1%	16.9%	38.5%	23.0%
Educational Institutions	14.7%	27.7%	15.9%	18.8%

Note: Percentages were calculated based on the PHAs/projects that reported groups/institutions as uncooperative.

Measures Taken When Verification Requests Were Outstanding

When problems and difficulties arose in verifying information, PHAs/projects tried to resolve these issues though a variety of methods. PHAs/projects were asked to rank the three actions they took most frequently when verification was not provided as requested. These ranks were combined to calculate the total percentage of PHAs/projects that have reported the various actions. When verification was not provided, the majority of PHAs/projects sent a follow-up letter to the third party (70%) or to the tenant (59%) (See Exhibit F-3e). Less than half of PHAs/projects with outstanding verifications reported calling the third party (44%), calling the tenant (43%), or using electronic verification or data matching (42%), while the minority acknowledged accepting other, less preferred verification information when the more preferred verification could not be obtained (31%).

The Owner-administered projects were the most likely to send letters to third-parties or tenants (79% and 69%, respectively), in addition to calling the tenant (46%), to obtain verification (See Exhibit F-3e). PHA-administered Section 8 projects were the most likely to use electronic verification or data matching (51%), but were less likely to use other methods to obtain outstanding verification. The Public Housing projects were the least likely to resort to accepting less preferred verification (22%).

Exhibit F-3e: Measures Taken When Verification Was Not Provided As Requested, by Program Type

Measures Taken When Verification Was Not Provided	Program Type			Total
	Public Housing	PHA-Administered Section 8	Owner-Administered	
Sent Follow-Up Letter to Third Party	64.2%	67.3%	78.5%	70.2%
Sent Follow-Up Letter to Tenant	54.9%	52.7%	69.1%	59.4%
Called Third Party	57.5%	48.0%	28.3%	44.4%
Called Tenant	44.0%	37.3%	46.1%	42.9%
Used Electronic Verification or Data Matching (e.g., EIV)	45.1%	50.7%	31.9%	41.9%
Accepted Other/Less Preferred Verification	22.3%	38.0%	35.1%	31.3%

Note: Percentages were calculated for PHAs/projects that reported their actions when verification was not provided.

4. Use of Automated Systems

Capabilities of Computer Software Regarding the Recertification Process

Automated systems and computer software continue to play an integral part in a PHA/project's daily tasks. Ninety six percent of PHAs/projects indicated that they have used computer software to help calculate tenant rent (See Exhibit F-4a). Of these PHAs/projects, the vast majority reported that their software was capable of submitting data to PIC/TRACS (91%), bringing forward household-specific information from previous Forms HUD-50058/50059 (91%), annualizing individual sources of income/expenses (90%), containing pre-loaded information (88%), and allowing staff to enter Forms HUD-50058/50059 after its manual completion (78%). Additionally, less than half of the PHAs/projects reported that their computer systems were limited in their capabilities, such as: requiring staff to manually enter the utility allowance, payment standard, contract rent, etc. for each unit type (26%), manually annualize income and expenses prior to automatic calculation of total adjusted income (20%), manually enter the utility allowance, payment standard, and contract rent. for each individual household (20%), and manually add together all sources of income/expenses and calculate the total adjusted income prior to entry into the system (12%).

With respect to program type, Public Housing projects were least likely to report the capabilities of their computer systems, and most likely to report limitations of their computer systems that include: manually annualizing income and expenses prior to automatic calculation of total adjusted income (27%), in addition to manually adding together all sources of income/expenses and calculating the total adjusted income prior to entry into the system (18%). Conversely, PHA-administered Section 8 projects were most likely to report limitations of their computer systems as manually entering the utility allowance, payment standard, and contract rent for each unit type and for each individual household (34% and 31%, respectively).

Exhibit F-4a: Capabilities of Computer Software, by Program Type

Tasks Performed by Computer Software	Program Type			Total
	Public Housing	PHA-Administered Section 8	Owner-Administered	
Helps Calculate Tenant Rent	94.9%	97.3%	96.3%	96.1%
Capabilities				
Submits Data to PIC/TRACS*	80.6%	97.9%	97.3%	91.4%
Brings Forward Household-Specific Information From Previous Forms HUD-50058/50059s and Allows Updating with Current Information*	81.7%	96.5%	94.6%	90.5%
Annualizes Individual Sources of Income/Expenses When Rate and Frequency of Income or Expense Is Entered*	86.6%	93.1%	91.3%	90.1%
Contains Pre-Loaded Information Such as Payment Standards or Utility Allowances and Selects the Appropriate Standard/Allowance Based on Household Type, Total Annual Income, or Unit Size*	81.7%	93.1%	91.3%	88.3%
Allows Forms HUD-50058/50059 Data Entry After Its Manual Completion*	74.2%	79.2%	81.5%	78.2%
Limitations				
Requires Manually Entering of the Utility Allowance, Payment Standard and Contract Rent for Each Unit Type*	23.1%	34.0%	21.2%	25.5%
Adds Together All Sources of Income/Expenses and Calculates Total Adjusted Income, but Only After Manually Annualizing Income and Expense for Each Type of Income/Expense*	26.9%	14.6%	17.9%	20.2%
Requires Manually Entering the Utility Allowance, Payment Standard, and Contract Rent for Each Individual Household*	21.5%	31.3%	9.2%	19.8%
Requires the Annualization of Income and Expenses for Each Type of Income/Expense, Manual Addition of all Sources of Income/Expenses and Calculation of the Total Adjusted Income Prior to Entry into the Computer System*	18.3%	8.3%	8.7%	12.1%

Note: Percentages were calculated for PHAs/projects that responded to the specific item.
* Percentages were calculated based on PHAs/projects that indicated using the computer software to help calculate rent.

Use of Computers to Assist in the Recertification Process

PHAs/projects were also asked to describe how they use their computer software systems. Virtually all of the PHAs/projects (at least 94%) with computer software reported using it to print Forms HUD-50058/50059; calculate rent, income, or allowances; print letters to tenants; maintain demographic information about residents; and input verified information (See Exhibit F-4b). The majority also acknowledged using the computer software to assign recertification dates/appointments (76%), keep track of pending verifications (64%), input answers from a tenant interview (55%) and conduct rent reasonableness comparisons (54%). Using computer systems to conduct automated interviews with tenants was reported by less than a quarter of the PHAs/projects (20%). It is worth noting that the PHA-administered Section 8 projects were the most likely to use computer systems to assign recertification dates/appointments (85%) and to conduct rent reasonableness comparisons (80%). Additionally, Public Housing projects were most likely to input answers from a tenant interview transcript or checklist into their computer systems (60%).

Exhibit F-4b: Use of Computer Systems for Key Tasks, by Program Type

Use of Computer Systems	Program Type			Total
	Public Housing	PHA-Administered Section 8	Owner-Administered	
Print Form HUD-50058/50059	97.5%	97.3%	99.0%	98.0%
Calculate Rent, Income, or Allowances	97.4%	98.0%	96.4%	97.2%
Print Letters to Tenants	96.4%	98.0%	97.4%	97.2%
Maintain Demographic Information About Residents	93.8%	97.3%	97.4%	96.1%
Input Verified Information	91.3%	95.9%	95.9%	94.2%
Assign Recertification Dates/Appointments	75.8%	84.5%	69.6%	75.9%
Keep Track of Pending Verifications	60.9%	63.8%	68.0%	64.3%
Input Answers From a Tenant Interview Transcript or Checklist	60.2%	52.7%	50.5%	54.6%
Conduct Rent Reasonableness Comparisons	48.4%	80.4%	39.3%	54.1%
Conduct Computer-Assisted Automated Interviews With Tenants	20.4%	20.8%	20.1%	20.4%

Note: Percentages were calculated for PHAs/projects that responded to the specific items.

5. Quality Control Procedures

Selecting Cases for Review and Frequency of Review

The PSQ collected information on whether PHAs/projects reviewed tenant files as a quality control measure after recertifications were conducted. Virtually all of the PHAs/projects (91%) indicated that they review tenant files in some form, as a quality control measure, after recertifications are conducted (See Exhibit F-5a). PHA-administered Section 8 projects were the most likely to review tenant files (96%), while Public Housing projects were the least likely to review cases (89%) as a quality control measure. Overall, in the past 12 months PHAs/projects checked an average of 47 percent of cases in a review and were most likely to conduct reviews on a monthly basis (39%), followed by annually or quarterly (21% and 19%, respectively).

With respect to the program type, Owner-administered projects had the highest average percentage of cases reviewed (59%), while PHA-administered Section 8 projects had the lowest percentage of cases reviewed (34%) (See Exhibit F-5a). Furthermore, Owner-administered projects were the most likely to conduct reviews quarterly or annually (23% and 30%, respectively) and were the least likely to review weekly or monthly (7% and 30%). Conversely, PHA-administered Section 8 projects were the most likely to review cases weekly or monthly (20% and 47%), but were the least likely to review quarterly or annually (16% and 12%).

Exhibit F-5a: Percent of Cases and Frequency of Quality Control Review in the Past 12 Months, by Program Type

Frequency of Quality Control Review	Program Type			Total
	Public Housing	PHA-Administered Section 8	Owner-Administered	
PHA/Projects That Review Tenant Files as a Quality Control Measure After Recertifications	88.7%	96.0%	89.6%	91.1%
Cases Checked in a Review (Percentage) *	46.0%	33.9%	59.0%	46.9%
Reviews Conducted on a Weekly Basis*	9.9%	19.7%	7.0%	11.7%
Reviews Conducted on Monthly Basis*	42.4%	46.5%	30.2%	39.3%
Reviews Conducted on a Quarterly Basis*	18.6%	15.5%	22.7%	19.1%
Reviews Conducted on an Annual Basis*	19.8%	12.0%	29.7%	21.0%

* Percentages were calculated for PHAs/projects that review tenant files as a quality control measure after recertifications.

Methods Used to Select Cases for Review

Ninety-one percent of PHAs/projects that indicated they review tenant files as a quality control measure after recertifications were also asked to indicate the percentage of cases that were checked in these reviews in the past 12 months. Among the PHAs/projects, about a quarter reported reviewing all cases, which is a decrease from previous years (40% in FY 2011 and 33% in FY 2010) (See Exhibit F-5b). Owner-administered projects most likely to review all cases in FY 2012 (34%) and PHA-administered Section 8 projects least likely to do so (12%).

PHAs/projects that reported checking less than 100 percent of cases were then asked to rank-order the three methods they used most frequently to select cases for review. The ranks of these top three methods were combined to calculate the total percentage of PHAs/projects that reported using the various methods. PHAs/projects that reviewed tenant files reported using the following methods most frequently to select cases: randomly spot checking a percentage of all cases (85%); reviewing files where recertifications were completed within a given period (58%); and reviewing recertifications conducted by new staff (40%) (See Exhibit F-5b). The other methods of checking files, including reviewing files for households with certain characteristics or anomalies in addition to checking recertifications completed by staff with past performance problems, were endorsed by approximately 30 percent of PHAs/projects that review their recertification cases.

With respect to the program type, Owner-administered projects were most likely to randomly spot-check cases (93%) and check files with certain characteristics or anomalies (37%) (See Exhibit F-5b). Additionally, PHA-administered Section 8 projects were most likely to check recertifications completed within a given period (61%); those that were completed by new staff (50%); and recertifications completed by staff with past performance problems (37%).

Exhibit F-5b: Methods Used by PHA/project to Select Cases for Review, by Program Type

Methods Used to Select Cases for Review	Program Type			Total
	Public Housing	PHA-Administered Section 8	Owner-Administered	
Reviewed All Cases	26.0%	11.9%	33.5%	24.5%
Spot-Checked Some Cases at Random*	90.3%	72.3%	92.9%	84.5%
Checked Certain Cases Completed Within a Given Period*	54.0%	60.5%	58.2%	57.6%
Checked Recertifications Conducted by New Staff*	38.1%	47.9%	33.7%	40.3%
Checked Files With Certain Characteristics or Anomalies*	28.3%	27.7%	36.7%	30.6%
Checked Recertifications Conducted by Staff Who Had Past Performance Problems*	29.2%	37.0%	21.4%	29.7%

Note: Percentages were calculated for the PHAs/projects that indicated they review tenant files as a quality control measure after recertifications.
* Percentages were calculated based on PHAs/projects that indicated they did not review all (100%) tenant files.

Tools and Techniques Used to Monitor the Recertification Process

PHAs/projects that indicated they review tenant files as a quality control measure after recertifications, were also asked to rank order three techniques that most effectively identified errors during the quality control operations. These were combined to calculate the total percentage of PHAs/projects that reported the various techniques. The techniques rated as most effective in identifying errors included: reviewing files after completion (66%); using predesigned forms to check key steps in the recertification (50%); reviewing files while the recertification was being processed (37%); discussing recertifications with staff after completion (34%); and discussing recertifications while they are being processed (28%) (See Exhibit F-5c). The other techniques were endorsed by less than a quarter of PHAs/projects.

PHA-administered Section 8 projects were most likely to report reviewing files after completion or using a pre-designed form to check key steps in the recertification process as the most effective techniques for identifying errors (83% and 66%, respectively) (See Exhibit F-5c). Meanwhile, Public Housing projects were the most likely to report discussing the recertification with staff after completion (39%) or while it was being processed (31%). Finally, Owner-administered projects were most likely to report reviewing files while the recertification was being processed (54%). Interestingly, Owner-administered projects were also the least likely to endorse the highest ranked techniques by other program types, which included reviewing files after completion or using a predesigned form to check key steps (56% and 43%, respectively).

Exhibit F-5c: Effective Techniques Used to Monitor Recertifications in the Past 12 Months, by Program Type

Techniques Used to Monitor Recertifications	Program Type			Total
	Public Housing	PHA-Administered Section 8	Owner-Administered	
Review Files After Completion	63.1%	83.0%	55.7%	66.4%
Use Pre-Designed Form to Check Key Steps	45.2%	66.0%	42.5%	50.4%
Review Files While Recertification was Being Processed	31.5%	22.7%	53.9%	36.8%
Discuss Recertification With Staff After Completion	39.3%	35.5%	26.3%	33.6%
Discuss Recertification With Staff While Being Processed	31.0%	22.7%	29.9%	28.2%
Make Individualized Notes for Each Case Reviewed	25.6%	23.4%	16.2%	21.6%
Use Computer Program	15.5%	22.0%	24.6%	20.6%
Sit in on the Interview With the Client	22.6%	7.8%	17.4%	16.4%
Re-Interview Household	3.6%	1.4%	4.2%	3.2%

Note: Percentages were calculated for the PHAs/projects which indicated that they review tenant files as a quality control measure after recertifications.

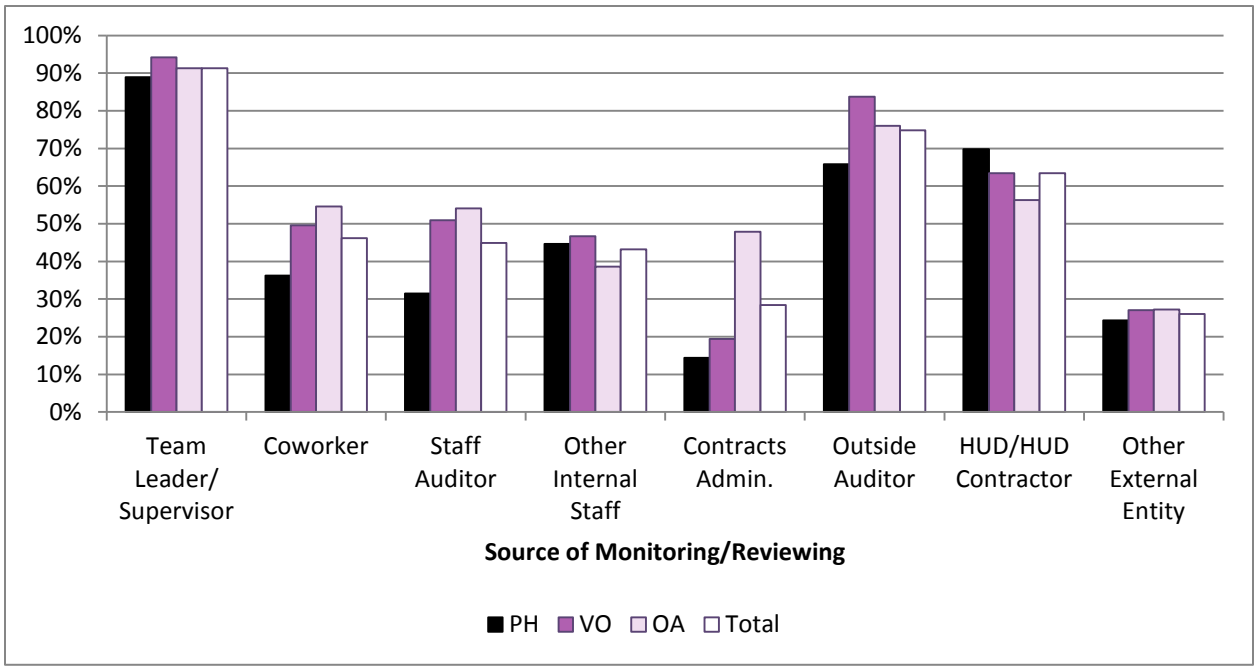
File Reviewers

The majority of PHAs/projects that review tenant files as a quality control measure after recertifications indicated that the review or monitoring of recertifications was conducted primarily by the team leader or supervisor (91%), outside auditor (75%), or HUD (63%) (See Exhibit F-5d). Less than half of PHAs/projects reported using other file reviewers (e.g., staff auditor, coworker, other internal staff, contract administrator, or other external entity) to conduct reviews or monitor recertifications. PHA-administered Section 8 projects were the most likely to rely on a team leader or outside contractor (94% and 84%, respectively), while Public Housing projects were most likely to rely on HUD (70%) to monitor or conduct reviews of recertifications. Interestingly, Owner-administered projects were overwhelmingly more likely to use contract administrators (50%) than the other program types during the quality control review process.

Exhibit F-5d: The Source of Monitoring or Reviewing of Recertifications, by Program Type

(PH = Public Housing, VO = PHA-Administered Section 8, OA = Owner-administered)

File Reviewers



Note: Data presented in the figure were calculated for the PHAs/projects that indicated that they review tenant files as a quality control measure after recertifications.

Prevalence of Various Types of Errors

PHAs/projects that indicated they review tenant files as a quality control measure were asked to rank-order the three types of errors that they found most frequently during the quality control review process. The ranks of these top three errors were combined to calculate the total percentage of all PHAs/projects that reported the various errors. The majority of PHAs/projects (65%) rated missing or incomplete verifications of income as the error found most frequently after reviewing recertifications, followed by mistakes in calculating rent (57%), and missing or incomplete verification of expenses (56%) (See Exhibit F-5e). Thirty-two percent of all PHAs/projects indicated that they found cases with overdue recertifications, and only two percent reported encountering cases with errors in the determination of eligibility. However, over a quarter of PHAs/projects also reported encountering other types of errors not covered by the questionnaire (31%).

The Owner-administered projects were the least likely to report finding cases with missing or incomplete verifications of income (55%), mistakes in calculating rent (48%), or overdue recertifications (24%) (See Exhibit F-5e). PHA-administered projects were the most likely to report mistakes in calculating rent (74%) and missing or incomplete verification of expenses (61%). Public Housing projects were more likely to encounter cases with missing or incomplete verifications of income (74%) or cases with overdue recertifications (47%), and least likely to report missing or incomplete verification of expenses (47%), or errors related to eligibility (1%).

Exhibit F-5e: Prevalence of Various Types of Errors, by Program Type

Types of Errors Found in Cases	Program Type			Total
	Public Housing	PHA-Administered Section 8	Owner-Administered	
Missing or Incomplete Verifications of Income	73.7%	67.4%	54.7%	65.3%
Mistakes in Calculating Rent	52.0%	73.6%	48.0%	57.1%
Missing or Incomplete Verification of Expenses	47.4%	60.5%	59.5%	55.5%
Overdue Recertifications	47.4%	24.8%	23.6%	32.4%
Determination That Applicants Are Eligible When They Should Not Be Eligible	1.3%	2.3%	2.7%	2.1%
Other Types of Errors	24.3%	27.9%	41.2%	31.2%

Note: Percentages were calculated for the PHAs/projects that indicated that they review tenant files as a quality control measure after recertifications.

Characteristics of Households That Were More Likely to Have Errors

Of the PHAs/projects that indicated that they review files as a quality control measure, less than half (45%) reported providing rental assistance to certain types of tenants whose recertifications were more likely than others to have errors in eligibility determination and rent calculation (See Exhibit F-5f). The Owner-administered projects were the least likely to report having such tenants (37%), while Public Housing projects were the most likely to provide rental assistance to these tenants (50%).

The PHAs/projects that indicated certain households that were more likely to have errors reported on their recertifications were asked to describe these households. The households that were described as error prone most frequently included those with volatile incomes (31%) and multiple sources and types of income (27%) (See Exhibit F-5f). Less than a quarter of PHAs/projects described these households as having multiple/complex sources of assets (13%), expenses (12%), policy complications (11%), and large families (5%). With respect to the program type, the Public Housing projects were the most likely to report households with volatile incomes, expenses, and large families as error prone (33%, 12%, and 11%, respectively). PHA-administered Section 8 projects were most likely to report households with policy complications as error prone (17%), while Owner-administered projects were least likely to report households with volatile incomes (27%) as most error prone.

Exhibit F-5f: Characteristics of Households That Are More Likely to Have Errors, by Program Type

Characteristics	Program Type			Total
	Public Housing	PHA-Administered Section 8	Owner-Administered	
PHA/Projects That Reported Having Certain Types of Tenants Who Were More Likely Than Others to Have Errors	49.7%	47.8%	36.6%	44.6%
Households With Volatile Income*	33.3%	31.8%	27.1%	31.1%
Households With Multiple Sources and Types of Income*	28.4%	21.2%	30.5%	26.7%
Households With Multiple/Complex Sources of Assets*	4.9%	18.2%	18.6%	13.1%
Households With Expenses (e.g., Medical, Childcare) *	12.3%	10.6%	11.9%	11.7%
Households With Policy Complications (e.g., EID, Elderly/Disabled/Student Statuses) *	9.9%	16.7%	5.1%	10.7%
Large Families*	11.1%	0.0%	3.4%	5.3%

Note: Percentages were calculated for the PHAs/projects that indicated that they review tenant files as a quality control measure after recertifications.
* Percentages are based on PHAs/projects that indicated households with certain characteristics were more likely to have errors.

Causes of Errors

PHAs/projects that indicated that they review tenant files as a quality control measure were asked to rank the three causes of errors in eligibility determinations and rent calculations. These top three causes of errors were combined to calculate the total percentage of all PHAs/projects that reported the various causes of errors. Similar to results in previous years, the issue that most frequently caused errors was the occurrence of tenants providing inaccurate or incomplete information (89%); followed by complex HUD regulations for rent calculations (38%); complexity of using electronic sources (36%); and not having enough staff to handle the workload (25%) (See Exhibit F-5g). The other causes of errors (frequent changes in eligibility regulations and complex determination of eligibility) were rated as occurring frequently by less than a quarter of the PHAs/projects.

The sharpest contrast between program types was around the matter of not having enough staff to handle the workload, reported by 41 percent of the PHA-administered Section 8 projects and only 9 percent of the Owner-administered projects. The PHA-administered Section 8 projects were also more likely to report tenants providing inaccurate/incomplete information, complex regulations for rent calculations, and complex determination of eligibility as frequent causes of error (90%, 49%, and 15%, respectively).

Exhibit F-5g: Causes of Errors in Eligibility Determinations and Rent Calculations in the Past 12 Months, by Program Type

Causes of Errors in Eligibility Determinations and Rent Calculations	Program Type			Total
	Public Housing	PHA-Administered Section 8	Owner-Administered	
Tenants Providing Inaccurate/Incomplete Information	88.6%	89.9%	88.7%	89.0%
Complex HUD Regulations for Rent Calculations	30.4%	48.6%	35.3%	37.7%
Complexity of Using Electronic Sources Such as EIV for Gathering Information About Tenants	36.1%	22.5%	48.0%	35.9%
Not Having Enough Staff to Handle the Workload	27.2%	40.6%	9.3%	25.3%
Frequent Changes in HUD Regulations Concerning Eligibility for Assistance	19.0%	15.2%	14.0%	16.1%
Complexity of Determining Eligibility for Assistance	7.0%	14.5%	7.3%	9.4%

Note: Percentages were calculated for the PHAs/projects that indicated that they review tenant files as a quality control measure after recertifications.

Strategies Used to Address the Causes of Errors Identified

In order to minimize various types of errors in the recertification process, PHAs/projects take corrective and preventative actions. In FY 2012, the PSQ collected information on the various strategies that PHAs/projects used to address top-ranked causes of errors using the open-ended response format. PHAs/projects that indicated that they review tenant files as a quality control measure also described the following error-reduction strategies: using tenant communication (e.g., sending informative mails, termination letters, request additional interviews, self-documentations) (42%); training staff on policy, procedures and topics with the most common errors and providing one-on-one training in addition to training with experienced staff (41%); improving rent calculation and verification processes and procedures (e.g., using forms, manually calculating rent, and thorough inspection of documents/items prior to data entry; allowing more processing time; using EIV and/or third-party verification) (33%); and improving compliance, checks and balances (e.g., outside audits/audits by compliance staff; consult specialists; streamline and improve internal processes and follow-up procedures; use computer system with internal checks) (27%) (See Exhibit F-5h). The rest of the strategies were reported by less than a quarter of the PHAs/projects.

With respect to the program type, Public Housing projects were the most likely to report tenant communication, and improvements to both rent calculation and verification, as strategies to reduce errors (49% and 37%, respectively), but were the least likely to report training staff as a strategy (35%) to reduce errors. Conversely, PHA-administered Section 8 projects were least likely to report tenant communication (36%), and improvements to both rent calculation and verification (28%), but were most likely to endorse the rest of the strategies with the exception of the other, unclassified strategies. Notably, Owner-administered projects were most likely to report using other, unclassified strategies (12%), and further, least likely to report improving compliance, checks and balances (24%), providing adequate resources (15%), and improving the review process (15%), as strategies to reduce top-ranked causes of error.

Exhibit F-5h: Strategies Used by PHAs/projects to Reduce Recertification Errors, by Program Type

Characteristic	Program Type			Total
	Public Housing	PHA-Administered Section 8	Owner-Administered	
Tenant Communication (e.g., Send Informative Mails and Termination Letters, Request Additional Interviews, Request Self-Documentations)	48.6%	36.4%	41.3%	42.3%
Train Staff on Issues Such as Policy, Procedures, Topics With the Most Common Errors, and Provide One-On-One Training as Well as Training With Experienced Staff	35.4%	48.8%	39.1%	40.9%
Improve Rent Calculation and Verification Processes and Procedures (e.g., Using Forms, Manually Calculating Rent, and Thorough Inspection of Documents/Items Prior to Data Entry; Allow More Time for Processing; Using EIV and/or Third-Party Verification)	36.8%	27.9%	34.8%	33.3%
Improve Compliance, Checks and Balances (e.g., Outside Audits/Audits by Compliance Staff, Consult Specialists, Streamline and Improve Internal Processes and Follow-up Procedures, Use Computer System With Internal Checks)	25.0%	32.6%	23.9%	27.0%
Provide Adequate Access to Resources (e.g., Discuss Issues and Policies at Staff Meetings; Refer to HUD Field Office, HUD Guidebooks or Other Policy Sources; and Stay Up-to-Date With HUD Policies)	25.7%	31.8%	15.2%	24.1%
Improve Review Process (e.g., Review Selected Items or Cases and Make Corrections; Double Check One's Own Work; and Review Selective Cases [Move-Ins Processed by New Hires])	15.3%	17.8%	15.2%	16.1%
Staffing Management (e.g., Hire/Re-Assign Additional Staff; Allow for Comp/Overtime for Staff; and Evaluate/Terminate Employees)	14.6%	23.3%	7.2%	14.8%
Other Strategies	5.6%	5.4%	12.3%	7.8%

Note: Percentages were calculated for the PHAs/projects that indicated that they review tenant files as a quality control measure after recertifications and indicated strategies to reduce recertification errors.

Suggestions to Reduce Error

In addition to collecting information regarding the strategies that PHAs/projects used to address the most common causes of error, the PSQ also collected suggestions, using the open-ended response format, about changes PHA/project staff would like to make to the recertification process to reduce errors in the future. Of the PHAs/projects that indicated that they review files as a quality control measure, 70 percent of PHAs/projects submitted suggestions regarding changes that would help the PHAs/projects minimize errors. Among these PHAs/projects, the most common suggestions were to simplify HUD policy or regulations regarding asset, income, and expense calculation (39%), and to address project-specific and tenant-specific issues not directly related to HUD or HUD policy (34%) (See Exhibit F-5i). Other suggestions included improving recertification documentation, process, and procedures (31%); improving verification tools, process, and policies (28%); and improving EIV (27%). A minority of PHAs/projects made other suggestions or reported that no changes were needed to reduce error.

With respect to program type, PHA-administered Section 8 projects were, interestingly, the most likely to suggest the majority of the changes with the exception of improving EIV (50% for simplifying HUD policies/regulations, 40% for addressing project- and tenant-specific issues,

and 39% for both improving recertifications and improving verification), and were the least likely to report that no changes were required to reduce error (See Exhibit F-5i). Conversely, Owner-administered projects were most likely to suggest improving EIV (36%), and least likely to suggest simplifying HUD policies or regulations (33%) and improving recertification documentation, process, and procedures (26%). Public Housing projects were least likely to suggest improving verification tools, process, and policies (15%) in addition to addressing project and tenant-specific issues, (30%), and moreover, most likely to report that no changes were required (12%).

Exhibit F-5i: Suggestions Provided by PHA/Project Staff on How to Reduce Errors, by Program Type

Characteristic	Program Type			Total
	Public Housing	PHA-Administered Section 8	Owner-Administered	
Simplify HUD Policy or Regulations Regarding Asset, Income, and Expense Calculation	34.2%	49.1%	32.7%	38.7%
Address Project-Specific and Tenant-Specific Issues Not Directly Related HUD or HUD Policy (e.g., Increase in Number of Staff, Train More Staff, Increase Tenant Outreach)	29.2%	40.4%	33.6%	34.3%
Improve Recertification Documentation, Process, and Procedures	28.3%	38.6%	26.2%	31.1%
Improve Verification Tools, Process, and Policies	15.0%	38.6%	29.9%	27.6%
Improve EIV	29.2%	17.5%	35.5%	27.3%
Other	10.0%	9.6%	4.7%	8.2%
No Changes Required/NA/None	11.7%	2.6%	7.5%	7.3%

Note: Percentages were calculated for the PHAs/projects that indicated that they review tenant files as a quality control measure after recertifications and provided suggestions for error reduction.

Methods Used to Clarify and Implement HUD Policies

PHAs/projects were asked to rank the three methods they used most frequently to answers questions about HUD policies in the past 12 months. These ranks were combined to calculate the total percentage of PHAs/projects that reported using these methods. When PHAs/projects required clarification concerning HUD policies, the majority of them rated the following methods as the most frequently used to receive answers to their questions: asking HUD field office or other HUD staff (59%); referring to HUD/PHA/owner memo or manual (56%); and using the Internet, Web-based information, or training (53%) (See Exhibit F-5j). Less than a third of PHAs/projects reported determining the answers themselves without any assistance (31%), asking questions at a HUD training session (26%) or meeting with other PHAs/owners (25%). The other methods were used by a minority of PHAs/projects.

PHA-administered Section 8 projects were most likely to ask HUD field office or other HUD staff (71%), use the Internet, Web-based information, or training (58%), and determine answers themselves (35%). Public Housing projects were most likely to refer to the HUD/PHA/owner memo or manual (59%) and to watch training videos (16%) to clarify HUD policies. Conversely, Owner-administered projects were least likely to use the Internet, Web-based information or training (49%), and watch training videos (4%).

Exhibit F-5j: Methods for Getting Answers to Questions About HUD Policies in the Past 12 Months, by Program Type

Methods for Getting Answers to Questions	Program Type			Total
	Public Housing	PHA-Administered Section 8	Owner-Administered	
Ask HUD Field Office or Other HUD Staff	54.0%	71.4%	54.8%	59.2%
Refer to HUD/PHA/Owner Memo or Manual	59.4%	51.0%	56.9%	56.1%
Use Internet, Web-Based Information, or Training	52.4%	57.8%	48.9%	52.7%
Determine the Answer Themselves	28.3%	35.4%	29.8%	30.8%
Ask Questions at a HUD Training Session	28.3%	17.0%	30.9%	26.1%
Hold Meetings or Talks With Other PHAs/Owners (e.g., Round Tables, Regional Meetings)	23.5%	21.8%	28.2%	24.7%
Use Contractors/Consulting Services	12.8%	17.7%	19.1%	16.5%
Watch Training Videos	16.0%	12.2%	3.7%	10.5%

Note: Percentages were calculated for PHAs/projects that reported using methods for getting answers to questions.

C. Conclusion

Overall the PSQ questions regarding staff training, recertification practices, verification processes, use of computer systems, and quality control procedures revealed a detailed, complex, and interesting picture of PHAs/projects. Demographically, there was a slight increase in the number of units from past years, though this was met by a slight increase in the number of staff that handle recertifications to maintain a stable caseload between years. With respect to project practices, virtually all of PHAs/projects required education, training, experience, qualifications, and various skills when hiring new recertifications staff. Furthermore, almost all of PHAs/projects reported conducting training of recertification staff on new policies, new procedures, or new quality control operations. Similarly, virtually all of the PHAs/projects reported verifying all of the various incomes, expenses and other household characteristics while processing move-in or annual recertifications. In addition, almost all of PHAs/projects indicated that they have used computer software to help calculate tenants' rents and reported that the software is able to conduct a wide variety of tasks, with a minority of limitations. Interestingly, PHAs/projects did not use computer systems frequently to automate interviews with tenants, but the majority did indicate that they have used questionnaires or checklists developed in-house to gather information during the recertification process. With respect to the monitoring of these recertifications, almost all of the PHAs/projects indicated that they review tenant files as a quality control measure.

The PSQ showed descriptive changes that occurred in FY 2012 when compared to past years. Although the rate and prevalence of staff turnover among PHAs/projects surveyed remained stable, the reasons for turnover did not. The endorsement of retirement as a reason decreased from past years, while interagency and interdepartmental transfers showed an increase. On the other hand, with respect to hiring new recertification staff, there was a shift in educational requirements. While a high school degree or GED is still the most frequent requirement, this requirement showed a decrease among PHAs/projects surveyed when compared to past years. Conversely, the requirement of a two-year college degree demonstrated an increased rate of

endorsement. Additionally, changes for experienced staff were also shown to be results of this analysis. In past years, experienced recertification staff and staff reassigned to recertification tasks were provided comparable hours of training; however, in FY 2012, staff reassigned to recertifications were provided more training hours than the experienced staff. Beyond changes to staffing among those PHAs/projects surveyed, a sharp shift in how information is gathered for recertifications was also found. In-person interviewing became the most frequent method of gathering information for both move-in/initial and annual recertifications, as opposed to telephone interviews for move-in/initial certifications, and using a form for annual recertifications in past years. Also, with respect to implementing quality control procedures, fewer PHAs/projects, who were surveyed, than in previous years reported reviewing all tenant files.

The PSQ also provided some specific information regarding the experiences and issues of PHAs/projects with respect to the recertification process. For instance, during the quality control monitoring of recertifications, the majority of PHAs/projects reported randomly spot-checking some cases, and furthermore reporting that the most effective quality control technique is to review the files after completion of recertifications. The most common type of error found during this quality control review process was missing or incomplete verifications of income. Also, PHAs/projects specified that households with volatile incomes and multiple types/sources of income were most likely to have errors. These quality control reviews also unveiled another issue experienced by PHAs/projects during rent calculation: PHAs/projects specified that tenants who provided incomplete or inaccurate information were the leading cause of errors found during quality control reviews. Additionally, the issue most frequently encountered by the majority of PHAs/projects in obtaining complete verifications was tenants providing inaccurate/incomplete third-party information, followed by employers not responding to requests in timely manner. Employers and tenants were also viewed as the least cooperative groups in the verification process.

The open-ended questions provided further insights into the characteristics, experiences, and practices of PHAs/projects. PHAs/projects described, in detail, various strategies that they have used to address causes of recertification errors, such as using communication with tenants, training staff, improving the rent calculation process, and improving compliances, checks and balances. Furthermore, PHAs/projects provided specific suggestions on how to reduce recertification errors, including simplifying HUD policies and regulations regarding assets, income, and rent calculations, as well as various project-specific and tenant-specific issues such as increasing the number of staff, training more staff, or increasing tenant outreach/education. In addition, PHAs/projects described, in detail, methods they have used to clarify and implement new or changing HUD policies, which included asking the HUD field office for guidance, referring to HUD/PHA/owner manuals, and using the Internet/Web-based information, or training.

For future HUDQC studies, it would be helpful to develop and validate additional items that specifically target potential difficulties in conducting training, managing staff performance, getting support from various sources in verifying tenants' information, and lastly target specific types of errors that were found during the quality control review process. Also, to provide a richer view of project practices to HUD, the development of questions that directly link staffing and staff performance to recertification and quality control procedures is desirable. While focus

groups and cognitive interviewing may be optimal in supporting the revision of the PSQ items by focusing attention on the specific circumstances and issues faced by the PHAs/projects, we have also realized that open-ended questions help identify and explain these issues. Gathering detailed descriptions of these aspects of the recertification process would lend to a more complete and detailed picture of the issues faced by the PHAs/projects and to provide a better link between PSQ information and the estimation of payment and income errors.

Appendix G—Multivariate Analysis

APPENDIX G—MULTIVARIATE ANALYSIS

Objectives

The FY 2012 HUDQC multivariate analyses followed an approach used in previous years' studies to identify project and household factors related to rent errors and errors in the certification/recertification process made by project staff (Objective 13). The multivariate analyses also aimed to determine whether error rates and error costs have statistically significant differences between programs, and to address the extent to which error rates in projects that use an automated rent calculation system differ from errors in those that do not (Objective 12), and to determine whether error rates and error costs had statistically significant difference between program types (Objective 5). Using measures of project characteristics and operations combined with household variables, the multiple regression analysis sought to systematically assess project and household variables in terms of the *net effect on the rent error and project-caused errors*.[4] To meet the study objectives, we addressed two research questions:

1. Other things being equal, what project characteristics, project operations, and household variables accounted for rent error and project-caused errors?
2. What was the effect size (or relative strength) of project characteristics, project operation features, project-made errors, and household characteristics in accounting for gross rent error?[5]

Guided by the conceptual framework in the previous years' studies, the analyses examined two models based on the research questions above: one model examining rent errors (gross, overpayment and underpayment) and one model examining project-caused errors. Focusing on project factors and project-caused errors in connection to rent errors, we attempted to generate useful information for HUD program improvement. Household or tenant characteristics associated with rent error were examined as well to provide information about potential risk cases in certification. The remainder of this appendix is organized into the following sections: Background, Data and Variables, Methodology, Findings, and lastly, a Summary.

Background

Modeling Rent Errors. The dollar amount of rent error was measured in terms of subsidy overpayment, subsidy underpayment and gross rent error. Overpayment is defined as the dollar value of HUD's subsidy rent payment greater than the rent determined in this QC evaluation for a given household. Underpayment is the dollar value of the HUD payment smaller than the rent as determined by the QC evaluation for a given household. Gross error is the dollar amount of either overpayment or underpayment (in absolute value) for a given household (See Appendix A

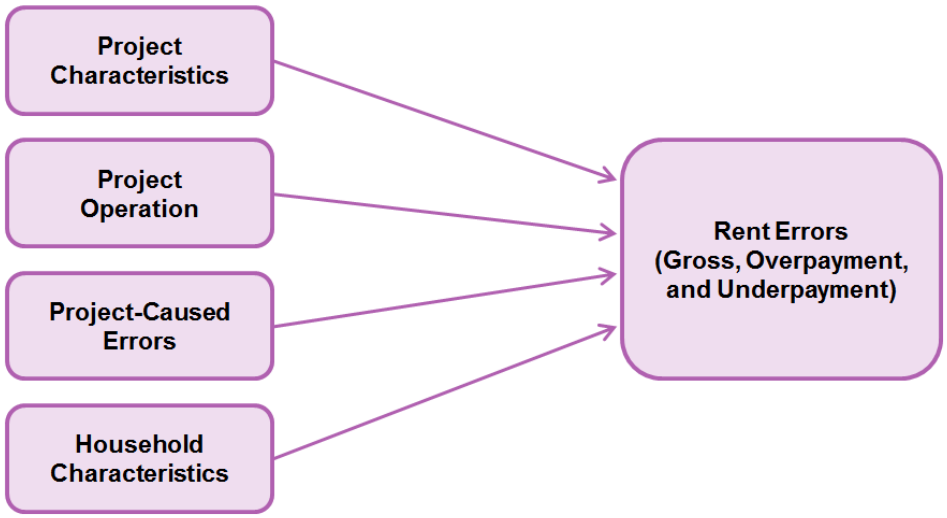
[4] The term "net effect" refers to the relationship between a given independent variable and the outcome variable, statistically controlling for other independent variables in the model (i.e., the slope, or regression coefficient *b,* in multiple regression modeling). The term does not necessarily imply a causal effect, as this cross-sectional, survey-based design does not warrant causal conclusions.

[5] Estimation of the "effect size" for predictor variables requires valid measurement of each variable, sensible model specifications, and a good model fit. In survey data analysis, however, it is always challenging to obtain accurate measures of every variable and specify models that generate robust estimates of effect sizes.

for calculations of the three measures). As the three measures of rent error may relate to project and household factors in different patterns, modeling each rent error measure should be informative to program improvement.

Hypothetically, dollar amounts of rent errors are affected by four sets of factors: project characteristics, project operations, project-caused errors, and household characteristics (See Figure G-1). Project characteristics include organizational and staffing features (e.g., program type, caseload, requirements for hiring, staff experience and training). Project operation covers certification or recertification interviews, monitoring, review, verification practices, and computer applications. Project-caused errors are defined as errors or problems that occur during the process of recertification and determination of rent subsidy as revealed in the QC evaluation (See II. Methodology in the report and the Methodology section below for definitions of the error types).

Figure G-1
Conceptual Framework for Modeling Rent Errors



Modeling Project-Caused Errors. The available measures of project-caused errors may not be adequate to realistically represent all potential project errors. Not all indicators of project-caused errors were found to be important in accounting for rent errors. Some project errors were unrelated or even reversely related to the dollar amount of rent errors due to possible overlapping or confounding effects among multiple errors and other project or household factors.

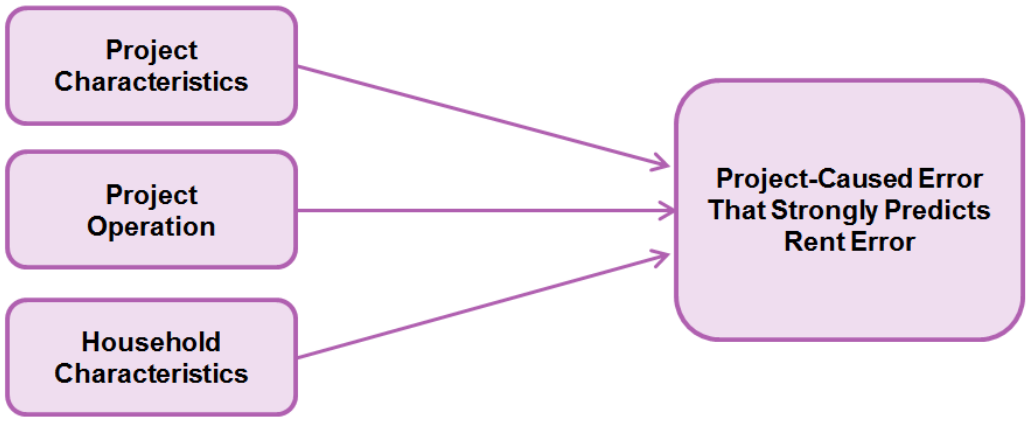
Household characteristics refer to household financial conditions and demographics. The concept and related indicators of household characteristics have been well-established in prior studies as important predictors of the rent errors. Household financial conditions and demographics imply risk factors that project staff should monitor when managing cases. We considered household background variables as exogenous in the model because they were not responsive to project management and operations.

In the second conceptual model, we consider project-caused errors as the consequence of project characteristics, project operation, and household characteristics (See Figure G-2). Project-made

errors were identified through investigation of household records conducted by the field work. By default, project-caused errors are, to a varying extent, related to rent error. Project-caused errors occur due to limitations in organizational resources, insufficient staff skills, a lack of rigorous quality control, and complicated household financial situations during certifications and payment determinations. Some project-caused errors in prior analyses were strongly predictive of rent error. Examining the pattern in which project and household factors account for project-caused errors may help housing management reduce such errors.

It is not clear, however, the implication of relationships *among* project errors. When project errors were defined and data coded, some were similar, closely related, or even overlapping. Thus, in modeling a given project-cause error, we did not use other project-caused errors as predictors.

Figure G-2
Conceptual Framework for Modeling Project-Caused Errors



Data and Variables

Household and project data were combined and underwent data processing, missing data imputation, data editing and rescaling, composite variable construction, and data analysis. Data analysis entailed examining psychometric properties of key measures; the bivariate relationship between predictor variables and outcome variables; and diagnostic analysis to address issues such as outliers, multicollinearity[6] among predictor variables, and two-level variance distribution.

The household records were matched with the affiliated projects using the project identification code. The resulting data set contains 2,404 household cases affiliated with 554 projects.[7] Subsequent diagnostic analysis identified four cases as outliers, which were removed before the

[6] When a predictor is a linear combination of other predictors in the model, the coefficient estimates tend to be unstable with large standard errors, a problem known as collinearity or multicollinearity.

[7] Of the 554 sampled projects (or project-like entities) for the Project Staff Questionnaire, 7 projects failed to respond. Affiliated with the 7 nonresponding projects, 31 households were covered by the household data collection but had quite different values in rent error and other key variables than other households. We imputed project data for these 31 household records and retained these records in the merged household and project data set. The total number of projects included in the regression analysis was 554. Please see Attachment 1 for more detail.

final modeling (see the section *Regression Diagnosis Analysis* later in this Appendix). The final analysis used 2,400 household records linked to 554 project records. The activities of data editing, initial analysis, and final model specification and estimation are summarized below.

Project Data

Project data were obtained from the Project Staff Questionnaire (PSQ) data file containing 249 original data items collected from a national sample of housing projects or project-equivalent entities (See PSQ report for design detail). The raw data required extensive efforts in editing, rescaling, and bivariate comparison to build composite indicators of project characteristics and project operation. Initially, data items were selected if they appeared to have the potential to represent concepts that explain rent errors. The original data items were tabulated and assessed in for conceptual relevance, sufficient variation, extent of nonresponse, and relationships with other data items for possible construction of composite indicators. Selected data items were then recoded or rescaled or combined to derive new variables. Sporadic missing data were imputed using program means (See Attachment 1). These efforts generated 57 composite indicators and rescaled variables for testing; of these, 21 were selected in the modeling.[8]

We selected project variables that were conceptually relevant to rent errors, although many did not have strong effect estimates. On the basis of descriptive statistics, judgments were made to exclude

- Variables that were applicable only to a subgroup of projects (e.g., project approaches to serving non-English speaking clients were not used because not all projects had such clients);
- Variables with responses that were difficult to quantify (e.g., "other" techniques used to review/monitor recertification);
- Variables that lacked variation (e.g., items regarding computer usage generated very high rates of positive answers, thus would have little use due to uniformed responses).

Breaking up statistics of project variables by binary indicator of gross error, we assessed the extent to which project characteristics differed by error status and eliminated those variables that were clearly identical for the error and non-error groups. Additionally, we tested a series of regression models, each with gross rent error as the dependent variable and a different set of independent variables representing project staffing, hiring requirements, training efforts, verification practice, certification monitoring methods, certification review procedures, the use of computer software, and ways to learn about HUD policy changes. The regression procedure was used to explore and identify relatively more meaningful predictors from each set of variables.

Project variables whose coefficient estimates were statistically significant in the testing model of the gross rent error were in the final modeling. Unfortunately, few project variables were found to be significant. The selection of additional project variables for modeling, therefore, was

[8] Data imputation was conducted to maximize the available data for analysis without statistical bias (See Attachment 2 for more detail). Data recoding/rescaling were conducted to consolidate information and facilitate modeling and statistical interpretation (See Attachment 3 for more detail).

primarily based upon informed judgments of the variables' conceptual relevance to rent error. Specifically, in the *project characteristics category*, we selected variables by focusing on personnel involved in the (re)certification process, including: program type, caseload, staff experience, hiring requirements, and staff stability. Under the category of *project operation*, we selected variables that described (re)certification procedures and quality control (QC) activities such as: the rate at which (re)certification involved personal interviews; checking paperwork items at move-in and certification; most frequently used verification methods; quality control taking place during or after (re)certification; most frequent problems affecting (re)certification; and computer and IT support.

After the initial selection, the large number of project variables was consolidated into three categories: background characteristics, certification staff training, and certification practice. These were further assessed via testing regression equations (See Attachment 2 for more detail). The final selection of project predictors was again based on their conceptual importance and statistical significance of regression coefficient estimates. The resulting variables represented constructs of project characteristics, staffing, and certification operation. They were summarized below (listed by variable labels). Exhibit G-1 presents descriptive statistics of the final project predictors, separated by rent error status. Attachment 2 lists descriptive statistics in rescaled measures that were used in the modeling. The definitions and measures of the project variables are listed below (Attachment 1 presents descriptive statistics for these variables).

Project Characteristics (PC) Indicators:

- PHA-administered Section 8: PHA-administered Section 8 program, binary coded one for PHA-administered Section 8 and zero for otherwise
- Public Housing: HUD Public Housing program, binary coded one for yes and zero for otherwise (Note, with the two binary-coded program indicators, the contrast group was the Owner-administered program)
- Cases per Staff (in 100s): Ratio of the household unit number over the total number of staff in the last 12 months (hereafter, project measures refer to a timeframe of the last 12 months), rescaled to 100 for easier presentation
- Cases per Certification Staff (in 100s): Derived ratio of the number of household units over the number of reported certification staff, rescaled to 100[9]
- Cases per New Certification Staff (in 100s): Derived ratio in the same way as above
- Cases per Experienced Certification Staff (in 100s): Derived ratio in the same way as above
- Percent New Staff: Percentage of new certification staff in the total certification staff
- Percent Experienced Staff: Percentage of experienced certification staff in the total certification staff
- Any Non-English Speaking Client: Dummy indicator of clients language background, one for projects that served non-English speaking households and 0 for projects that did not

[9] Respondents reported this ratio, which contained a large amount of missing data; so we derived this measure by dividing the total number of household served by the number of certification staff.

- Require All Three Housing-Specific Experiences: Dummy indicator of projects that required special housing-related credentials (training, housing-related certification, and other housing-related experiences)
- Hiring Requires More Than High School: Dummy indicator of projects that required some college education when hiring.

Project Operation (PO) Indicators:

- Frequent Training on New Issues: Dummy indicator of projects that reportedly engaged in frequent staff training on new housing policy issues
- Average Hours Training All Staff: Average hours of training for all staff
- Most Frequent Training Telecourse: Dummy indicator of projects that reported the most frequently used staff training method was telecourse or Web-based instruction
- Most Frequent Training Outside: Dummy indicator of projects that reported the most frequently used staff training method was by outside entities
- Average Percent-by-Person Interview: Percentage of (re)certifications that used personal interview (in contrast to telephone interview and application forms)
- Never Check Items at Either Time: Dummy indicator of projects that reported to have not checked one or more (re)certification document items, at either move-in or certification
- Most Frequent Verification Electronic Verification/Data Match: Dummy indicator of projects that reported the most frequent verification approach was electronic verification or data match
- QC in Certification Process: Dummy indicator of projects that reported (re)certification quality control (monitoring and reviewing) was done *during* the certification process
- Most Frequent Problem Staffing: Dummy indicator of projects that reported the most frequent problem causing rent error was staff failing to follow the procedure or staff lacking training (in contrast to external issues such as policy complexities or other parties lacking cooperation)
- Average Percent by Telephone Interview: Average percentage of (re)certifications using telephone interview (in contrast with personal interview and application form)
- Software With One or More Limitations: Dummy indicator of projects that reported at least one limitation of computer software used in daily work
- Number of Activities Used Computer: Number of a project's daily functions in which a computer was used.

Project-Caused Error Indicators[10]:

Of the numerous indicators of project-caused errors examined, five were found to be relatively important in accounting for rent errors with an acceptable level of collinearity. These were

[10] Data on project-caused errors were from the household data collection.

dichotomous variables (with one for error and zero for without error). They included overdue recertification error, consistency error, procedural error, transcription error, and calculation error.[11] We also examined indicators of project error on a ratio scale, namely, the transcription error rate (i.e., the proportion of transcribed items containing transcription errors) and the verification error rate (i.e., the proportion of the verification-required items without third-party verification in writing).

It is necessary to understand the causes of these project errors because project-caused errors may directly lead to rent error. In fact, five project errors were found to be statistically significant relating to larger gross rent error in subsequent regression analysis (See Exhibit G-2). These were (1) overdue recertification error (2) transcription error, (3) calculation error, (4) percentage items with transcription errors, and (5) percentage items without written third-party verification. Overdue recertification error and transcription error were consistently found to be strong predictors of gross error in prior studies.

To determine factors underlying project-caused errors, multivariate analyses were conducted using project characteristics, project operation, and household characteristics to account for each of the five project-caused errors. For binary-coded errors, logistic regression was used. For rates of transcription error and third-party verification errors, linear regression techniques were used. In addition, counts of all types of project-caused errors were summed to create an indicator of the overall extent of project errors, also modeled in linear regression analysis to examine how project features and household background factors contributed to the overall project error.

Household Data

The household data set contained outcome measures of the analysis such as dollar amount of rent errors, types of project-caused errors, and household financial conditions (e.g., income and expenses), as well as project-caused error measures discussed earlier. As a common practice, for monthly gross rent error, subsidy overpayment, and subsidy underpayment, the logarithm of each dollar value was taken to tighten the variables' skewed distributions where very few cases had large dollar amount errors and many had zero error.

Household Characteristics. The data were edited (recoding/rescaling and consolidating raw items) to construct composite variables from the original data items. Each variable's bivariate and multivariate relationships with gross rent error were examined, including all the household variables that were known to be predictive of gross rent error via past HUDQC multivariate analyses (FY 2000–FY 2011).

Household variables for modeling included interval measures such as total annual income dollar amount, head of household age, number of household members, number of bedrooms, and counts of financial items that involved individual members (pension incomes, medical expenses, allowances, expenses and incomes).

Binary-coded indicators included: households with disabled elderly (aged 62 or older) member(s), earned income, public assistance income, other income, and the Moving to Work

[11] Please refer to the HUDQC Final Report Chapters I: Introduction and II: Methodology for definition of each type of project-caused error.

program participation status—each coded as zero for no and one for yes. To make the statistic interpretation straightforward, we rescaled three interval variables that did not contain a zero value (number of bedrooms, household size, and head of household age) by subtracting each variable's grand mean from each individual value, a rescaling process known as centering.

Methodology

Regression Diagnosis Analysis. Regression diagnostic analysis was conducted prior to modeling to identify and remedy issues related to excessive collinearity, outliers, and other problems that distort statistical estimation (see Attachment 3 for detail).

Collinearity or multicollinearity occurs when a linear combination of explanatory variables in the model are highly correlated. Coefficient estimates tend to be unstable with large standard errors. The diagnostic results were largely comparable with earlier studies. A number of project and household predictors were found to have high multicollinearity and those that were conceptually less important were excluded from analysis.

We then examined residual distribution of the predicted gross rent error and records with unduly influence on regression (See Attachment 3). In addition to studentized residual scores that quantify the distorting effect of outliers to the estimation, two measures of excessively influential data points were also calculated: the leverage that helps identify the most influential cases and Cook's D that combines residual and leverage to assess the data points' overall unusual influence on regression. Four cases were found with values exceeding the cut-off points of all three measures, thus, they were excluded from the modeling.

Further, an unconditional Hierarchical Linear Model (HLM) was conducted to assess the rent error variance distribution at PHA/project and household levels. Project-level variance of the log gross error was estimated to be 5.8 percent of the total variance (See Attachment 4), a finding comparable with previous year estimates. The small proportion of project-level variance made using the HLM technique insignificant for this study (Raudenbush & Bryk, 2002). Therefore, ordinary least square regression was substituted to model rent error.

Model Specification and Estimation. Multivariate analyses were conducted to account for rent errors (gross rent error, subsidy overpayment, and subsidy underpayment). Regression equations were specified with the four sets of predictor variables by using a procedure known as sequential modeling. In this approach, we incrementally included into the equations four sets of predictor variables: project characteristics, project operations, project-caused errors, and household characteristics. The sequential modeling allowed us to observe the changes in parameter estimates (regression coefficients and R-square) as each group of predictor variables enter into the equation. Estimates from the four sequential models were presented for the gross rent error analysis, whereas only the final model estimates were presented for underpayment and overpayments.

Unless otherwise noted, we conducted statistical analyses with the SURVEY procedures of SAS 9.3 on the Window using Jackknife replicate weights to adjust for design effects (see Appendix B on weighting). SAS SURVEYREG was used for multiple regression modeling of gross rent error, overpayment, and underpayment, as well as the interval measures of project-caused errors.

For modeling binary-coded project-caused errors, we used PROC SURVEYLOGISTIC. PROC MIXED was used for variance analysis of rent error at project and household levels. For descriptive statistics, we used PROC SURVEYMEANS when accurate standard error and 95 percent confidence limits were needed. All statistics presented here were generated with sample weights and replicate weights, using the jackknife procedure. SAS conventional procedures were used to examine the raw data and conduct regression diagnosis.

Findings

To address the first research question of identifying predictor variables that accounted for rent error and project-caused errors, we present bivariate tabulation, regression coefficients, and related significance test statistics to establish whether or not an effect exists beyond chance (i.e., statistically significant).

Gross Rent Error

Starting with descriptive statistics, all the selected predictor variables were tabulated for two groups of households: Those with and those without gross rent error. This offers a preliminary view of the predictor variables differentiated by gross rent error. Exhibit G-1 presents statistics of the predictor variables in the original scales by the indicator of binary-coded gross rent error (with or without an error of $5 or more). For statistics of the rescaled/centered predictor variables for the whole sample, see Attachment 3.

If the estimated ranges of a given variable's mean—shown by the 95 percent confidence level (CL)—overlap for the two groups, then the predictor would be considered as significantly different by gross error status. To interpret differential patterns, we list the following characteristics that were statistically significant, which describe the group with gross rent error (See rows denoted with * in the middle column, Exhibit G-1):

- Households with rent errors tended to have more project-caused errors, including: percentage items with transcription error, percentage items without third-party written verification, and transcription error.
- Households with rent error tend to be smaller in household size, to have higher total annual income, more bedrooms; and are more likely to have earned income, and more medical expenses, sources of income and expenses, and allowances.

Exhibit G-1
Predictor Variables Used in Modeling: Households With and Without Gross Rent Error
(Original Scales, Weighted and Design Effects Adjusted)

Variables	Households Without Error n=1,752					Households With Errors n=648			
	Mean	Standard Error	95% CL for Mean			Mean	Standard Error	95% CL for Mean	
Project Characteristics									
Public Housing	0.253	0.007	0.239	0.267		0.224	0.018	0.187	0.260
PHA-Administered Section 8	0.445	0.009	0.426	0.465		0.508	0.022	0.461	0.555

Variables	Households Without Error n=1,752					Households With Errors n=648			
	Mean	Standard Error	95% CL for Mean			Mean	Standard Error	95% CL for Mean	
Cases per Certification Staff (in 100s)	2.305	0.206	1.875	2.735		2.297	0.180	1.921	2.672
Percent New Staff	44.658	1.356	41.831	47.486		43.464	1.473	40.391	46.538
Percent Experienced Staff	83.027	1.165	80.597	85.457		83.353	1.426	80.379	86.326
Percent Staff Turnover	16.781	1.157	14.367	19.196		16.669	1.683	13.158	20.180
Any Non-English Speaking Client	0.696	0.034	0.626	0.767		0.735	0.035	0.662	0.807
Require All Three Housing Specific Experiences	0.154	0.022	0.107	0.200		0.184	0.036	0.108	0.259
Hiring Requires More Than High School	0.328	0.030	0.265	0.391		0.358	0.035	0.285	0.432
Project Operations									
Frequent Training on New Issues	0.854	0.016	0.820	0.887		0.814	0.027	0.758	0.870
Average Number Hours Training All Staff	43.010	4.024	34.615	51.404		41.115	1.248	38.512	43.719
Most Frequent Training: Telecourse	0.102	0.018	0.064	0.141		0.106	0.020	0.065	0.147
Most Frequent Training: Outside	0.184	0.018	0.147	0.221		0.176	0.022	0.130	0.221
Average Percent by Person Interview	87.253	1.368	84.399	90.107		83.499	2.067	79.187	87.811
Fail to Check Items Both Move-In and Recertification	0.055	0.011	0.033	0.077		0.035	0.007	0.021	0.049
Most Frequent Verification: Electronic Verification/Data Match	0.243	0.029	0.182	0.303		0.242	0.039	0.160	0.323
QC in Certification Process	0.161	0.017	0.125	0.197		0.145	0.025	0.093	0.197
Most Frequent Problem: Staffing	0.048	0.014	0.020	0.076		0.071	0.023	0.023	0.119
Average Percent by Telephone Interview	7.574	0.747	6.017	9.131		7.437	0.716	5.943	8.931
Software With One or More Limitations	0.367	0.027	0.311	0.423		0.385	0.034	0.314	0.456
Number of Activities Using Computer	8.513	0.091	8.323	8.703		8.707	0.126	8.444	8.971
Project-Caused Errors									
Percent of Items With Transcription Errors	0.162	0.009	0.143	0.180	*	0.378	0.013	0.352	0.404
Percent of Items Without Written Third-Party Verification	0.045	0.007	0.031	0.059		0.077	0.010	0.056	0.098

Variables	Households Without Error n=1,752					Households With Errors n=648			
	Mean	Standard Error	95% CL for Mean			Mean	Standard Error	95% CL for Mean	
Overdue Recertification Error	0.003	0.002	0.000	0.007	*	0.024	0.007	0.009	0.039
Consistency Error	0.164	0.014	0.135	0.194		0.206	0.019	0.165	0.246
Procedure Error	0.194	0.013	0.167	0.221		0.252	0.019	0.213	0.292
Transcription Error	0.317	0.017	0.282	0.351	*	0.734	0.019	0.695	0.774
Any Calculation Error	0.046	0.005	0.037	0.056		0.067	0.014	0.039	0.096
Household Characteristics									
Number Household Members	2.045	0.041	1.959	2.132	*	2.403	0.066	2.266	2.540
Total Annual Income $1,000	12.093	0.411	11.236	12.950	*	15.798	0.416	14.931	16.665
Number of Bedrooms	1.849	0.039	1.767	1.930	*	2.048	0.046	1.953	2.143
Earned Income	0.313	0.019	0.274	0.353	*	0.591	0.037	0.514	0.668
Other Income	0.213	0.014	0.184	0.243		0.246	0.016	0.213	0.279
Public Assistance Income	0.086	0.013	0.059	0.113		0.125	0.023	0.078	0.172
Pension Income	0.990	0.041	0.904	1.076		1.172	0.093	0.978	1.365
Medical Expense	0.596	0.064	0.463	0.729	*	1.020	0.129	0.751	1.290
Total Number of Sources of Income/Expenses	2.448	0.096	2.247	2.649	*	3.611	0.172	3.253	3.969
Total Number of Allowances	1.134	0.020	1.093	1.175	*	1.430	0.028	1.370	1.489
Age of Head of Household	51.674	0.730	50.151	53.197		50.180	0.925	48.251	52.110
Household With Elderly/Disabled	0.574	0.018	0.537	0.610		0.568	0.025	0.515	0.621

*The two groups differ statistically significantly in the predictor variable at $p < .05$ level.
Source: HUDQC FY 2012 household-level data collection and Project Staff Questionnaire

Multiple Regression Models. In multiple regression analysis of the rent error, the regression coefficient estimate indicates the given predictor's relationship with the rent error, net of other predictor effects (hereafter, statements to interpret regression coefficient estimates are qualified such that the estimated effect exists while holding other conditions equal). With sequential modeling of gross rent error, we specified four multiple linear regression equations to estimate the effects of incrementally entering the equations' four predictor groups: project characteristics, project operation, project-caused errors, and household characteristics (see Exhibit G-2). The resulting statistics show the effects of predictors that were entered into the equation, related estimate changes for the previously-entered predictors, and the model fit. The final model (model 4) included all four sets of variables representing the four constructs.

The R-square estimate for each model shows the extent to which the specified predictor variables accounted for the variance of the outcome variables. To address the second research question of assessing the *relative effect size* of predictor variable groups, we provided the effect size using Cohen's f^2 and percentages of variance accounted for by predictor groups.[12]

The estimated intercept presented a reference point for interpreting estimates of predictor effects on gross rent error from each model. For example, in model 3, the intercept estimated in log scale was 0.660, equivalent to $1.90.[13] This was the expected average gross error of a "reference" group of households that had a zero value on each predictor variable in the model. For binary-coded predictors such as Public Housing and PHA-administered Section 8, the zero value represented the Owner-administered program. For project-caused errors, the zero value indicated error free for a particular type. For household-level interval predictors that were rescaled by centering,[14] the "reference" households were characterized by the mean value of a given predictor. For example, for total annual income, the centered zero value was the average annual income of the sample.

A coefficient estimate for a predictor, if statistically significant, represents the difference from the "reference" or "contrast" value in gross rent error associated with this predictor. We focused on interpreting the regression coefficients that were statistically significant ($p < .05$ or smaller) as they represented effects that were unlikely to be due to chance. For predictors of key project factors, we may briefly discuss the findings, even if the estimates were not significant.

Exhibit G-2
Log Gross Rent Error Accounted for by Selected Variables: Multiple Regression Coefficients and Derived Dollar Value Net Effects From Sequential Models With Design Effect Adjusted

Predictors	Model 1			Model 2			Model 3			Model 4		
	Coefficient		$	Coefficient		$	Coefficient		$	Coefficient		$
Intercept	0.886	**	$2.43	0.852	**	$ 2.34	0.640	*	$ 1.90	-0.096		$ 0.91
Project Characteristics												
Public Housing	0.038			-0.055			-0.090			-0.137		
PHA-Administered Section 8	0.210	!	$0.57	0.095			0.169			0.062		
Case per Staff	-0.015			-0.016			-0.017			-0.012		

[12] The effect size for multiple regression analysis may be assessed by comparing the change of the R^2. Given an R^2_A value resulting from an equation with a set of independent variables A, and an R^2_{AB} value generated from an equation with the A and another set of independent variables B, Cohen's f^2 is commonly used in the context of sequential (or nested) multiple regression analyses (Cohen, 1988). The f^2 effect size measure for multiple regression is defined as:

$$f^2 = \frac{(R^2_{AB} - R^2_A)}{1 - R^2_{AB}}$$

[13] Dollar amount of the intercept is e^l, where e is a constant approximately 2.718 and l is the estimated regression intercept in log scale. To convert coefficients in log scale to dollar amount, we added the log-scale estimate of a given predictor to the intercept log scale and converted the sum of log-scale values into dollar amount. The difference between the resulting dollar amount and the intercept-equivalent dollar amount is the estimated predictor effect in dollar amount of gross rent error. For example, in Mode 3, the difference associated with predictor "Frequent training on new issues," has a log estimate of -.229 ($p < .05$). Other things being equal, this effect decreased the gross error (-$0.48) from the reference group's estimates ($e^{(.852 - .229)} - e^{.852} = 1.864 - 2.34 = -.48$).

[14] Refer to Attachment 2 for more information regarding the creation of centered variables.

Predictors	Model 1			Model 2			Model 3			Model 4		
	Coefficient		$	Coefficient		$	Coefficient		$	Coefficient		$
Percent New Certification Staff	0.000			0.001			0.001			0.001		
Percent Experienced Certification Staff	0.002			0.002			0.002			0.002		
Percent Staff Left	0.001			0.001			0.000			0.000		
Any Non-English Speaking Client	0.048			0.046			0.053			0.049		
Require All Three Housing Specific Experiences	0.083			0.091			0.120			0.086		
Hiring Requires More Than High School	0.049			0.047			0.002			-0.010		
Project Operations												
Frequent Training On New Issues				-0.229	*	-$0.48	-0.186	!	-$0.32	-0.180	!	-$0.15
Average Hours Training All Staff				-0.001			0.000			0.000		
Most Frequent Training: Telecourse				0.044			0.080			0.079		
Most Frequent Training: Outside				-0.021			0.008			0.037		
Average Percent By Person Interview				-0.004			-0.002			-0.002		
Fail to Check Items Both Move-In and Recertification				-0.346			-0.370			-0.324		
Most Frequent Verification: Electronic Verification/Data Match				-0.120			-0.061			-0.029		
QC in Certification Process				-0.070			-0.053			-0.049		
Most Frequent Problem: Staffing				0.392	*	$1.12	0.286			0.181		
Average Percent By Telephone Interview				-0.002			-0.002			-0.002		
Software With One or More Limitations				0.086			0.098			0.052		
Number of Activities Used a Computer				0.043			0.013			0.018		

Predictors	Model 1			Model 2			Model 3			Model 4		
	Coefficient		$	Coefficient		$	Coefficient		$	Coefficient		$
Project-Caused Errors												
Percent of Items With Transcription Errors							0.619	**	$1.63	0.893	***	$1.31
Percent of Items Without Written Third-Party Verification							0.503	*	$1.24	0.463		
Overdue Recertification Error							1.612	**	$7.61	1.641	**	$3.78
Consistency Error							-0.158			-0.172		
Procedure Error							0.182			0.163		
Transcription Error							0.928	***	$2.90	0.589	***	$0.73
Any Calculation Error							-0.413	*	-$0.64	-0.469	*	-$0.34
Household Characteristics												
Number of Household Members-Centered										-0.035		
Total Annual Income $1,000										-0.003		
Number of Bedrooms-Centered										0.019		
Earned Income										0.440	***	$0.50
Other Income										0.166	*	$0.16
Public Assistance Income										0.261	*	$0.27
Pension Income										0.054		
Medical Expense										-0.016		
Total Number of Sources of Income/Expenses										0.036		
Total Number of Allowances										0.424	***	$0.48
Household Head Age-Centered										-0.004		
Households With Disabled Elderly										-0.090		
Moving to Work										-0.021		
R-Square	0.007			0.024			0.193			0.257		
Adjusted R-Square	0.003			0.015			0.184			0.244		

Predictors	Model 1			Model 2			Model 3			Model 4		
	Coefficient		$	Coefficient		$	Coefficient		$	Coefficient		$
Cohen's F^2	0.003			0.012			0.171			0.074		
Percent of Variance Accounted For	0.29%			1.68%			16.95%			6.39%		

*p < .05, **p < .01, ***p < .001 (test with the null hypothesis that a coefficient = 0; a significant result indicates that the corresponding variable(s) is associated with the dependent variable). "!" indicates p < .10, denoting notable variables that were close to being statistically significant.
Source: HUDQC FY 2012 household-level data collection and Project Staff Questionnaire

With model 1, relative to the reference group and net of other factors, households under PHA-administered Section 8 had a barely significant higher gross rent error (i.e., log scale .210, p <.10, equivalent to an increase of $0.57); whereas Public Housing households did not appear to differ from the reference group, as their coefficient was not significantly different from zero. In the subsequent models with incrementally more predictors, the estimate for PHA-administered Section 8 difference changed to not significant, implying that the initial estimated difference was explained by newly entered predictors. The net effects of other project characteristics were not found to be statistically significant.

Model 2 revealed that a project operation variable, frequent training on new housing issues, was significant (log -0.229, p < .05). This suggests that households with projects most frequently providing such staff training tended to have moderately lower rent error (relative to the reference group, $0.48); however, the effect diminished in both size and significance level in the subsequent two models after project error and household variables entered into the equation.

Another binary indicator, projects reporting that the most frequent problem for quality control was staff unable to follow procedures and obtain training, was found relating to higher rent error (log scale .392 equivalent to $1.12, p < .05) in model 2 but the effect vanished in later models in which project-caused errors and household factors were considered.

A number of the effects of project-caused errors estimated in models 3 and 4 were remarkable. Percentage items with transcription error, percentage items without written verification, overdue recertification error, and calculation error were found to be significantly related to households' gross rent error. Of these, the estimate of percentage items without written verification diminished to not significant in the final model; the others were effective in both models. Particularly, transcription errors with two measures (percentage items with transcription error and binary transcription error) were estimated to predict substantially greater rent error (respectively, $1.63 and $1.31 in model 3 and $2.90 and $0.73 in models 3 and 4).

Overdue recertification had peculiarly large estimates, predicting significantly large rent error. Households with this error would expect to have a rent error of $7.61 in model 3 before considering household background and $3.78 in model 4 with household background measures. Note that overdue recertification rarely occurred; only 2.4 percent of households with rent error

had this error. Apparently, once this error occurred, a considerably large mistake in rent error would likely ensue.[15]

Calculation error is a binary variable for households that had any incorrect calculation of income, allowance, and other items. It was found to be modestly but statistically significant in relation to lower rent error (-$0.64 and -$0.34, both at $p < .05$ level, from models 3 and 4). It is possible that calculation errors might generate either overpayment or underpayment, aggregating into a modest negative effect on gross error.[16]

Remarkably, the findings for project-caused errors were quite consistent across years. Prior years' analyses have identified virtually the same indicators of project-caused errors to be predictive of rent error. Specifically, transcription errors (with the two indicators), lack of third-party written verification, and overdue recertification have been documented as major sources of improper payment subsidies.

Model 4 estimates household characteristic effects relating to gross rent error, in addition to the project variables in the equation. Again, the large patterns were highly consistent with prior studies. Net of other effects, households with complex financial conditions in terms of more sources of income and allowances, indicated by earned income, public assistance, or other incomes (other than earned/public assistance/pension incomes), and the number of allowances, were likely to have larger gross rent error. Projects that indicated they did not check into application items at times of move-in and recertification had lower gross rent error. The finding, is apparently counter-intuitive as common wisdom would suggest the opposite, i.e., intensive checking materials should reduce errors. These projects, however, were a very small group and the effect shown here might be a statistical artifact. Additional analysis may be needed to clarify this finding.

In short, consistent with findings from the studies for FY 2007 through FY 2011, the FY 2012 data analysis suggested gross error was related to a number of project and household factors. The most substantiated findings were the following:

- Project-caused errors, particularly, overdue certification and transcription errors, contributed strongly to increased gross error.
- Households that were characterized by complex financial conditions had greater gross rent error.

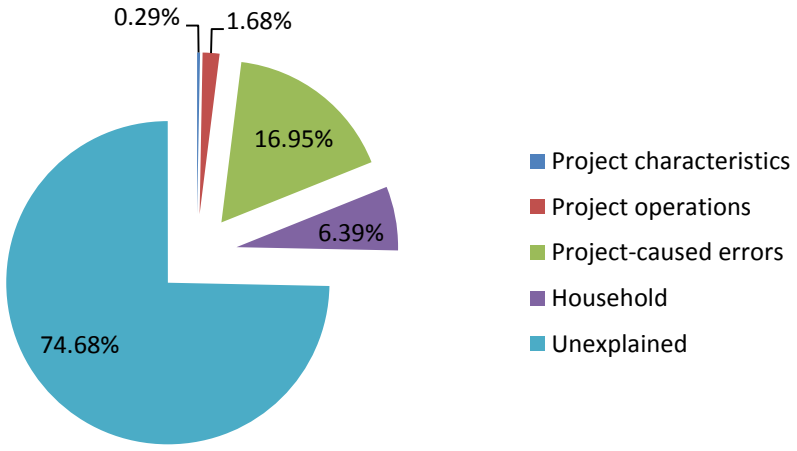
Relative Size of Effects by Variable Groups. Adding predictor variables into the sequential models incrementally accounted for the greater proportion of the variance of the gross rent error (Figure G-3). The largest share was accounted for by indicators of the project-caused error (16.95%), followed by household characteristics and financial conditions (6.39%). The proportion of gross rent error variance, explained by project characteristics and by project operation, amounted to only 0.29 percent and 1.68 percent, respectively.

[15] Overdue recertification was found to have occurred only with households under Public Housing and PHA-administered Section 8 projects.

[16] Additional analysis may be needed to clarify the calculation error estimate's negative value, small magnitude, and low significance level.

Corresponding to variance partitioning, the effect size estimates with Cohen's f^2 also show that project-caused errors represented the bulk of the effects on rent error (.171, see Exhibit G-2). Measures of household characteristics also had a sizable effect (.074) and project characteristics/operation effects were again found to be small (.03 and .012, respectively).

Figure G-3
Proportion of Variance of Gross Rent Error Accounted for by Predictor Variable Groups: Multiple Regression Analysis Adjusted for Design Effect



Source: HUDQC FY 2012 household-level data collection and Project Staff Questionnaire

Overpayment and Underpayment. We analyzed overpayment and underpayment rent errors to offer additional information for program improvement in dealing with these specific forms of rent error. We estimated two equations with the same four sets of predictors as in modeling gross rent error to explain overpayment and underpayment that were rescaled into a logarithm. Exhibit G-3 on page G-17 presents the resulting statistics.

The two models did not fit as well as the gross rent error models. As indicated by adjusted R-square estimates, the models account for approximately 12.3 percent and 10.1 percent of the total variance of underpayment and overpayment, respectively.

Somewhat similar to the findings with the gross rent error modeling, a number of predictors of project characteristics, project operation, project-caused errors, and household background were associated with underpayment in patterns similar to those with gross error. Households under Public Housing projects had a net lower overpayment (log -.241 or -$0.22, $p<.05$), though no effect on underpayment. Caseload per certification staff also predicted a very modest, albeit statistically significant, lower overpayment (-$0.02, $p<.01$).

Of project-caused errors, the percentage of items with transcription errors was found to predict higher underpayment and overpayment of approximately $0.53 and $0.61, respectively. Calculation errors made by projects lend a lower underpayment for households ($0.32), net of other factors, but no effect on overpayment.

Three household characteristics were related to underpayment. Net of other factors, households with higher total income tended to have very modest but significant, lower underpayment ($0.01 associated with every $1,000 income increase, p<.01). Counts of earned income, in contrast, was related to greater underpayment ($0.14 for every one more source of earned income, p<.05), while also predicting higher overpayment as well ($0.36). Households with a larger number of allowances tended to have significantly greater underpayment ($0.38 for each additional allowance).

More household characteristics were related to overpayment error, all in a positive direction. In addition to earned income relating to greater overpayment, counts of other income, public assistance incomes and pension incomes, and medical expenses were predictive of higher overpayment (respectively, $0.25, $0.51, and $0.17, with p <.05), net of other effects in the equation.

In short, consistent with prior year's estimates, the total annual income had a negative small net effect on underpayment; though this year, its effect on overpayment was not statistically significant as found in earlier years. Also note that, consistently over the years, transcription error was related to both underpayment and overpayment, making it a stronger factor predicting higher gross error. Household variables were related to underpayment and overpayment in a largely similar pattern as they predicted gross rent error. Other things being equal, more complex financial situations, measured in counts of earned incomes, public assistance incomes, and other incomes predicted higher underpayment and overpayment.

Exhibit G-3
Log Under- and Overpayment Rent Errors Accounted for by Selected Variables: Multiple Regression Coefficients and Derived Dollar Value Net Effects With Design Effect Adjusted

Predictors	Underpayment			Overpayment		
	Coefficient		$	Coefficient		$
Intercept	-0.119		$0.89	0.026		$1.03
Project Characteristics						
Public Housing	0.055			-0.241	*	-$0.22
PHA-Administered Section 8	0.036			-0.055		
Case per Staff	0.008			-0.022	**	-$0.02
Percent New Certification Staff	0.000			0.000		
Percent Experienced Certification Staff	0.001			0.002		
Percent Staff Left	0.000			0.000		
Any Non-English Speaking Client	0.083			-0.017		
Require All Three Housing Specific Experiences	0.080			0.023		
Hiring Requires More Than High School	0.016			-0.016		
Project Operations						
Frequent Training on New Issues	-0.024			-0.146		
Average Hours Training All Staff	0.000			0.000		
Most Frequent Training: Telecourse	0.007			0.098		
Most Frequent Training: Outside	-0.074			0.099		

Predictors	Underpayment			Overpayment		
	Coefficient		$	Coefficient		$
Average Percent by Person Interview	-0.003			0.001		
Not Checked Item(s) at Either Time	-0.148			-0.146		
Most Frequent Verification: Electronic Verification/Data Match	-0.079			0.016		
QC in Certification Process	0.053			-0.114		
Most Frequent Problem: Staffing	0.243			-0.047		
Average Percent by Telephone Interview	-0.002			-0.001		
Software With One or More Limitations	-0.003			0.072		
Number of Activities Used Computer	0.016			0.001		
Project-Caused Errors						
Percent of Items With Transcription Errors	0.466	*	$0.53	0.465	*	$0.61
Percent of Items Without Written Third-Party Verification	0.108			0.399		
Overdue Recertification Error	0.907			0.846		
Consistence Error	-0.411			0.171		
Procedure Error	0.474			-0.192		
Transcription Error	0.225			0.313	*	$0.38
Any Calculation Error	-0.446	*	-$0.32	-0.160		
Household Characteristics						
Number of Household Members—Centered	0.020			-0.037		
Total Annual Income $1,000	-0.011	**	-$0.01	0.010		
Number of Bedrooms—Centered	0.001			0.002		
Earned Income	0.148	*	$0.14	0.303	**	$0.36
Other Income	-0.048			0.219	*	$0.25
Public Assistance Income	-0.073			0.401	**	$0.51
Pension Income	-0.072			0.156	*	$0.17
Medical Expense	-0.060			0.059		
Total Number of Sources of Income/Expenses	0.053			-0.037		
Total Number of Allowances	0.358	***	$0.38	0.037		
Household Head Age—Centered	-0.002			-0.002		
Households Head With Disabled Elderly	-0.033			-0.135		
Moving to Work	0.032			-0.021		
R-Square	0.138			0.116		
Adjusted R-Square	0.123			0.101		

*p < .05, **p < .01, ***p < .001 (test with the null hypothesis that a coefficient [or R^2] = 0; a significant result indicates that the corresponding variable(s) is associated with the dependent variable).
Source: HUDQC FY 2012 household-level data collection and Project Staff Questionnaire

Project-Caused Errors

Analysis was needed to identify underlying factors leading to important project-made errors, which were determined by the error indicators' relative strength in predicting rent errors. Among

the seven indicators of project-caused errors, five were found to be meaningful relating to rent errors. They include overdue recertification error, transcription error, calculation error, percentage items without third-party written verification, and percentage items with transcription error. Additionally, an indicator of total counts of errors was created by summing all the seven project errors.

Prior years' analyses used the same set of predictors in project error modeling. It seems conceivable, however, that different factors may contribute to different project errors. For example, transcription error is possibly a result of both staff performance and complicated application paperwork, but perhaps more dependent on household financial conditions. In contrast, overdue recertification error seems largely a managerial issue, with little to do with household backgrounds.

Therefore, this analysis specified different models, using the stepwise selection feature of SAS regression procedures.[17] Three sets of predictors were tested: project characteristics, project operations, and household characteristics. Modeling a given project-caused error, other project-caused errors were not included as covariates, as they are likely to overlap to some extent in measurement.

Three binary measures, transcription error, overdue recertification error, and calculation error, were analyzed using multiple logistic regression. Percentage items with transcription error, percentage items without written verification, and the total project-error count, as ratio or interval measures, were analyzed with linear regression.

Exhibit G-4 presents the log scale estimates (log odds) and model fix statistics from the logistic models of the three errors in binary coding.[18] A logit coefficient indicates the extent to which a given predictor is associated with the likelihood of the given project error, with interpretation similar to that of linear regression coefficients. The model fit of the three logistic models was acceptable as model fit statistics indicating substantial reduction of the Akaike information criterion (AIC) values after predictors entered into the equation.[19] Predictor variables with a significant logit estimate (with $p < .05$) were considered as salient factors contributing to the project-caused errors, net of other effects. The findings from the modeling are summarized below.

[17] With SAS procedures SURVEYLOGISTIC and SURVEYREG, we specified significance level for entering and staying in all the equations as $p<.01$ and $p<.05$, respectively, for stepwise selection of predictors, after testing other levels of significance.

[18] Logit estimates rather than odds ratio are presented because logits can be understood in a similar way as linear regression coefficients. The logistic regression models the relationship between the outcome $Y=1$ (a given error in our analysis) and the predictor variables through the logit function, the natural logarithm of odds for $Y=1$. The model assumes a linear relation between the log of odds and predictor variables $X_1, X_2, \ldots, X_k$, and can be written as follows: Let $p=P(Y=1)$, then $\log (p/(1-p)) = intercept + b_1X_1 + b_2X_2 + \ldots + b_kX_k$. Max-rescaled R^2 allows the maximal value of 1 and is recommended as a better approximation of the variance explained by the logistic model, comparable with generalized R^2 (Hosmer & Lemeshow, 2001).

[19] AIC is commonly used to assess model fit in logistic regression. Generally, if AIC decreases significantly for a model with covariates relative to a model with only an intercept, (adjusting for number of covariates and other factors), then the model may be acceptable in goodness of fit. See Harrell (2001) for further details.

Exhibit G-4
Project-Caused Major Errors Accounted for by Selected Variables:
Multiple Logistic Regression Coefficients With Design Effect Adjusted

Model Transcription Error			Model Overdue Recertification Error[a]			Model Calculation Error		
Intercept	-1.868	***	Intercept	-20.811	*	Intercept	-4.526	***
Public Housing	0.197		Public Housing	16.291		Public Housing	2.190	***
PHA-Administered Section 8	-0.232		PHA-Administered Section 8	16.221		PHA-Administered Section 8	1.959	***
Case per Staff	0.007		Case per Staff	0.058	*	Case per Staff	0.024	
Percent New Certification Staff	0.001		Case per New Certification Staff	0.009		Percent new Certification Staff	0.004	
Average Percent by Person Interview	-0.006	*	Most Frequent Problem: Staffing	1.446	*	Any Non-English Speaking Client	-0.739	
Number of Activities Used Computer	0.078	**				Most Frequent Training: Outside	-1.009	**
Earned Income	0.417	***				Total Number of Sources of Income/Expenses	0.173	***
Pension Income	0.120							
Total Number of Sources of Income/Expenses	0.210	***						
Total Number of Allowances	0.513	***						
AIC (Null Model)	6452410			489295			1932552	
AIC With Covariates	5754098			440622			1743047	
Change in AIC	698312			48673			189505	

*p < .05, **p < .01, ***p < .001 (test with the null hypothesis that a coefficient = 0; a significant result indicates that the corresponding predictor variable is associated with the dependent variable.
[a] This error was highly predictable by program type (i.e., 10 and 9 out of the total 19 error cases were in Public Housing and PHA-administered Section 8, respectively, a pattern known as quasi-complete separation of data points). SAS procedure SURVEYLOGISTIC, however, does not provide remedies such as Firth logistic modeling or "exact" estimation. In general, the results are still acceptable while noting the estimates for the two predictors were inaccurate (Heinze & Schemper, 2002).
Source: HUDQC FY 2012 household-level data collection and Project Staff Questionnaire

Transcription Error:

- Households under projects that had a higher rate of frequent personal interview for certification or recertification were less likely to have a transcription error (logit -.006).
- Households under projects that used a computer for more daily functions were more likely to have a transcription error (logit .078).

- Households with more counts of earned income, incomes and expenses, and allowances were more likely to have a transcription error (logits .417, .210, and .513, respectively).

The pattern, similar to the findings in prior years, suggests that household financial conditions are important to explain transcription error. In an effort to reduce transcription error, housing programs may need to prioritize households with more complicated financial situations. Further, more personal interviews and more careful use of the computer system in processing (re)certification may help avoid transcription errors.

Overdue Recertification Error:

- Households under Public Housing and PHA-administered Section 8 programs were more likely to have overdue recertification errors (logits 16.291 and 16.221, respectively; the estimates may not be accurate due to a peculiar data pattern).[20]
- Households under projects that reported heavy caseloads for certification staff and that reported staff problems (not following procedures and lacking training) as the most frequent problem were more likely to have overdue recertification error (logits .058 and 1.445, respectively).

As expected, overdue recertification was largely related to projects' administrative features and staff quality, not to household backgrounds.

Calculation Errors:

- Households with Public Housing and PHA-administered Section 8 programs, again, were more likely to run into calculation errors as indicated by the fairly large logit estimates (2.190 and 1.959, respectively), net of other effects.

- Households with projects that held staff training activities most frequently with external entities were less likely to have calculation errors (logit -1.009).

- Households with more sources of income and expenses tended to result in calculation errors (logit .173).

A set of three linear regression models were tested with effective predictors selected to account for (1) the rate of item transcription error; (2) the rate of items without third-party written verification; and (3) the total counts of project-caused errors (Exhibit G-5). The model fit for the rate transcription error and the total counts of errors, which were acceptable, with an adjusted R-square of .114 and .176, respectively. The model of the rate items without written verification was relatively poor (R2 = .038), implying that the selected predictors in the model accounted for barely 4 percent of the variance of the percentage items, without written verification.

[20] The modeling identified a 'quasi-complete separation of data points' situation, in which the dependent variable was almost perfectly associated with two predictors: 10 and 9 out of the 19 overdue error cases were under Public Housing and PHA-administered Section 8 projects, respectively. The estimates for the two indicators may not be accurate, though the overall model fit was acceptable. We attempted to use Firth logisitc modeling or the exact estimation to remedy the issue; however, they are not available with SAS SURVEYLOGISTIC procedure. The estimates should be acceptable without correction because they showed the correlation pattern (Georg Heinze and Michael Schemper, 2002).

Nevertheless, the coefficient estimates were statistically significant, indicating net relationships between predictors and the dependent variable.

Highlighted below are the statistically significant and substantively meaningful predictors in the models, with the qualification that all other factors were held constant in each model.[21]

Percentage of Items With Transcription Error:

- Households under projects of the Public Housing program tended to have a moderately higher rate of items with transcription errors, with a 6.8 percent increase of the error rate over the reference group, net of other effects.
- Households under projects that went through higher rate of staff departure tended to have very modest higher rate (.01%) of items with transcription error.
- Households with projects that used personal interview for application at a higher rate tended to have a modestly lower rate of transcription error (-.01%).
- Households with projects that used a computer for more functions tended to have a higher rate (1.1%).
- Household size was negatively related to the rate of items with transcription error: a one-member increase in a household corresponded to a decrease of 1.9 percent in the error rate; households with more counts of incomes and expenses tended to have a higher rate of this error measure.
- Moving to Work participation status was related to a fairly large and significantly lower error rate (-12.0%, $p < .001$).

[21] Interpretation of the regression coefficient estimate in the three models is the same as that for gross rent error and underpayment and overpayment models (i.e., the expected change of the dependent variable associated with one unit change of the given predictor, relative to the intercept [the expected value of the dependent variable for the contrast group]).

Exhibit G-5
Project-Caused Errors Accounted for by Selected Variables:
Multiple Linear Regression Coefficients with Design Effect Adjusted

Model % Items With Transcription Error			Model % Items Without Verification			Model Total Number Project Error		
Predictor	**Estimate**		**Predictor**	**Estimate**		**Predictor**	**Estimate**	
Intercept	0.068		Intercept	0.027	**	Intercept	0.323	
Public Housing	0.068	***	Public Housing	0.037	**	Public Housing	0.322	***
Percent Staff Left	0.001	*	Section 8	0.021	*	Average Percent by Personal Interview	-0.003	*
Most Frequent Verification: Electronic/Data Match	-0.026		Hiring Requires More Than High School	0.033		Number of Activities Used Computer	0.040	**
Average Percent by Personal Interview	-0.001	*	Other Income	0.057	***	Most Frequent Training: Outside	-0.143	*
Number of Activities Used Computer	0.011	**	Medical Expense	0.009	*	Most Frequent Training: Telecourses	-0.171	
Earned Income	0.049	***	Household With Disabled Elderly	-0.029	**	Most Frequent Verification: Electronic/Data Match	-0.109	
Number of Household Members (Size)	-0.019	***				Number Sources of Income and Expense	0.132	***
Number of Allowances	0.024					Number of Allowances	0.328	***
Number of Sources of Income and Expense	0.023	***				Earned Income	0.105	**
Moving to Work	-0.120	***						
R-Square	**0.114**			**0.040**			**0.176**	
Adjusted R-Square	**0.111**			**0.038**			**0.173**	

*p < .05, **p < .01, ***p < .001 (test with the null hypothesis that a coefficient [or R^2] = 0; a significant result indicates that the corresponding variable is associated with the dependent variable).
Source: HUDQC FY 2012 household-level data collection and Project Staff Questionnaire

Percentage of Items Without Written Verification:

- Households with Public Housing and PHA-administered Section 8 projects tended to have higher rates of items without written verification (3.7% and 2.1%, respectively) relative to the reference group, other things being equal.
- Households having other incomes (other than earned, public assistance or pension incomes) and households claiming more medical expenses tended to have net higher rates of items without verification (5.7% and .09%, respectively).

- Households with member(s) of disabled elderly had a net higher rate of items without verification (-2.9%).

Total Number of Project-Caused Errors:

- Households managed under projects of the Public Housing programs tended to have more project-caused errors (an increase of .322 in average).
- A number of project operation measures were related to the *lower* total number of project errors: households under projects that most frequently used personal interview for (re)certification application; projects that most frequently conducted staff training by outside entities and/or via telecourses/Web courses; and projects that most frequently performed electronic verification and data match, tended to have fewer project errors (-.003, -.148, -.171, and -.109, respectively).
- Households under projects that used a computer for more functions tended to have slightly but statistically significant more project errors (.04).
- Three household financial condition measures were highly significant in relation to more project errors, including the number of sources of incomes/expenses, total number of allowances, and earned income (.132, .328, and .105, respectively).

Summary

The FY 2012 HUDQC multivariate modeling followed the conceptual and analytical approaches used in previous years, with some technical changes. The analysis identified large patterns in which rent errors related to project and household variables. The patterns were essentially similar to those reported in previous analyses, except that housing program types indicated no statistically significant difference in gross rent error, subsidy overpayment, underpayment, net other project and household effects.

Project-caused errors accounted for a large proportion of gross rent error, controlling for other effects. Of the project-caused errors, transcription errors, overdue recertification errors, the rate of items with transcription error, and the rate of items without third-party written verification predicted a higher gross error. Transcription error was a source of high subsidy overpayment and underpayment as well. The rate of items with transcription error related to higher overpayment and underpayment, and the binary-coded transcription error related to higher subsidy overpayment.

Calculation errors, an indicator of numerous subtypes of calculation mistakes, were found related to lower gross rent error and underpayment error in a moderate but statistically significant way. This finding seems to imply that calculation processes might generate errors that offset each other, ending up with an average lower rent error; further examination is needed to better understand this relationship. The major findings on effects of project-caused errors were comparable with those from previous years' analyses (i.e., FY 2008–FY 2011), underscoring the importance of reducing project-made errors, particularly, transcription errors and overdue recertification, in minimizing rent errors.

Household background variables were strong predictors of gross rent error, subsidy overpayment and underpayment. Variables indicative of complex financial conditions and income strongly predicted higher rent errors. The relationships between household financial/demographic variables and rent errors are highly consistent across models and years, a finding that suggests the robust and continuing household risk factors with which housing projects must cope.

The impact of project characteristics and project operations on improper payments remained elusive within the current data analysis. Most key indicators of project resources, staff capacity, training, certification and recertification procedures, computer application, and a broad array of quality control efforts were not found to be statistically significant and no substantial relationships were found with rent error measures. There were a few estimates generated from modeling that were statistically significant; however, when examined across equations or compared with prior years' analyses, they indicated trivial, unstable, or inconsistent project effects. As project management and operations are considered as important factors in improper payment reduction, it is necessary to continue in-depth analysis with improved measurement of project features in the Project Staff Questionnaire, in order to reveal the connections between housing management practice and rent error.

To explore factors influential to project-caused errors, logistic and linear regression analyses were conducted to account for transcription error (percent and counts), lack of third-party written verification, overdue recertification error, and the total number of project errors. Instead of using the same set of predictor variables used in the rent error modeling, stepwise selection was used to identify predictor variables that were most predictive of each project error, since different factors may underlie different project errors. The analyses generated evidence that there were different factors at work to explain project errors. Transcription error was related to project operations (frequent use of personal interview in certification and recertification, and the extent of computer application in operation), as well as complex household situations (earned income, number of sources of incomes and expenses, and allowances). In contrast, overdue recertification was associated only with housing program type (Public Housing and PHA-administered Section 8) and project issues such as caseload and staff capacity.

Future research is needed to further refine the measurement of project-made errors to allow more meaningful quantification of the relationships among project errors and their unique and joint effects on rent error. This calls for a better understanding of the nature of each type of project error and the underlying processes that lead to the error. Through clear conceptualization and solid measurement of project errors, we may be able to improve the analysis of project-made errors to generate actionable information.

Model specifications may be improved in future data analysis as well, using alternative or different predictors for gross rent error, underpayment, and overpayment. This analysis explored modeling project-caused errors with a more empirical approach (regression stepwise selection); however, a more comprehensive understanding of the housing management practices could improve the analysis. By combining the insights from the housing management operation and data-driven techniques, it is possible to build more succinct and predictive models to help elucidate complicated factors contributing to subsidy rent errors and project-caused errors.

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Attachment 1: Nonresponding Projects and Related Households

In the 2012 HUDQC Project Staff Questionnaire survey, 7 out of 554 sampled PHAs/projects did not respond to the survey, even after repeated contact. To assess potential bias of the nonresponding projects to the data integrity, we compared the households without project data and the rest of households in the sample by cross-tabulating the outcome variable, monthly gross rent error, with housing program type. This required merging the household file with the project file.

Merging the household file with the project file, we identified 31 household records whose matched projects did not respond to the survey and one project that responded to the survey but no household was surveyed. As designed, the original sample had 554 projects and 2,404 related households, whereas the merged data set contained 547 projects and 2,373 related households. Cross-tabulation of rent error by three program types for the two subsamples did find substantial and significant differences in gross error between the two subsamples, especially among PHA-administered Section 8 households (see Table 1.1). Therefore, it was necessary to retain the 31 household records by imputing project data for these cases.

Table 1.1 Gross Rent Error Differences: Households With and Without Project Data (Design Effect Adjusted)

	Cases Without Project Data (7 Projects, 31 Households)					Cases With Project Data (547 Projects, 2,373 Households)			
	Total	Public Housing	PHA Section 8	Owner-Administered		Total	Public Housing	PHA Section 8	Owner-Administered
N	31	11	12	8		2,373	792	788	793
Mean	39.74	10.77	50.33	45.40		14.60	14.03	17.11	10.71
Standard Error of Mean	5.15	8.61	0.43	37.79		1.23	2.13	2.02	1.84
95% CL for Mean	28.98	-7.19	49.43	-33.43		12.03	9.59	12.89	6.88
	50.49	28.72	51.23	124.23		17.17	18.46	21.34	14.54

Source: HUDQC FY 2012 household-level data collection and Project Staff Questionnaire

We used housing program mean imputations (PMI) to substitute the data for the 31 household records as the last year's (2011) analysis established that PMI generated more realistic values than did multiple imputation procedure. For dummy variables, the PMI produced probability scores (ranging from 0 to 1.0) were recoded, with values greater than 0.5 coded 1 and otherwise 0. The resulting statistics for key measures were presented below. The resulting data set contains 2,404 household records nested with 554 projects. Later, in regression diagnosis, 5 household records were identified as outliers with excessive influence to regression estimation, and removed from the analysis (see Attachment 4). Thus, 2,399 household records were in the final data set for regression analysis.

Table 1.2 Project Variable Differences After Imputation: Households With and Without Project Data (Design Effect Adjusted)

Project Variables	Households With PSQ Data n=2,373					Households With Imputed PSQ Data n=31			
	Mean	Standard Error	95% CL for Mean			Mean	Standard Error	95% CL for Mean	
Respondent: Cross-Project(b)	0.260	0.026	0.206	0.315		0.000	0.000	0.000	0.000
Case per Staff (in 100s)	0.713	0.045	0.618	0.807		0.788	0.232	0.304	1.273
Percent New Staff	44.285	1.178	41.826	46.743		43.102	4.031	34.694	51.511
Percent Staff With 5–9 Years	36.079	1.313	33.340	38.818		35.299	1.963	31.204	39.395
Any Non-English Speaking Client(b)	0.704	0.031	0.639	0.769		1.000	0.000	1.000	1.000
Derived Case per Staff (in 100s)	2.300	0.195	1.894	2.706		2.498	0.544	1.363	3.632
Case per New Certification Staff N=100	9.645	1.148	7.251	12.040		10.649	2.888	4.624	16.675
Case per Experienced Certification Staff N=100	3.061	0.199	2.645	3.477		3.321	0.753	1.749	4.893
Percent Experienced Staff	83.102	1.175	80.651	85.552		82.842	1.539	79.632	86.053
Require All Three Housing Specific Experiences(b)	0.164	0.025	0.112	0.217		0.000	0.000	0.000	0.000
Require Background Check(b)	0.698	0.027	0.642	0.754		1.000	0.000	1.000	1.000
Hiring Requires More Than High School(b)	0.343	0.029	0.284	0.403		0.000	0.000	0.000	0.000
Frequent Training on New Issues(b)	0.839	0.017	0.803	0.875		1.000	0.000	1.000	1.000
Average Hours Training All Staff	42.476	3.010	36.198	48.755		43.663	8.521	25.888	61.438
Most Frequent Training: With Senior Staff(b)	0.320	0.029	0.258	0.381		0.000	0.000	0.000	0.000
Percent Staff Left	16.722	1.182	14.255	19.188		16.085	1.316	13.339	18.831
Average Percent by Person Interview	86.204	1.466	83.146	89.262		86.076	2.856	80.118	92.034
One+ Items Unchecked Move-In and Recertification	0.050	0.009	0.031	0.068		0.000	0.000	0.000	0.000
Most Frequent Verification: Electronic Verification/Data Match(b)	0.245	0.029	0.185	0.306		0.000	0.000	0.000	0.000
Most Frequent Verification: Letter to Third Party(b)	0.395	0.028	0.336	0.454		0.221	0.190	-0.175	0.617
QC in Certification Process(b)	0.158	0.016	0.125	0.192		0.000	0.000	0.000	0.000
QC With Formal Key Steps(b)	0.195	0.023	0.148	0.242		0.000	0.000	0.000	0.000
Most Frequent Problem: Staffing(b)	0.055	0.016	0.022	0.088		0.000	0.000	0.000	0.000

Project Variables	Households With PSQ Data n=2,373					Households With Imputed PSQ Data n=31			
	Mean	Standard Error	95% CL for Mean			Mean	Standard Error	95% CL for Mean	
Average Percent by Telephone Interview	7.539	0.678	6.126	8.953		7.388	0.259	6.847	7.929
Average Days Processed Before Recertification	79.365	1.329	76.592	82.138		78.833	2.281	74.075	83.590
Formal Guide Interview(b)	0.832	0.023	0.783	0.881		1.000	0.000	1.000	1.000
Number of Certifications Monitored Outside Groups	1.676	0.042	1.588	1.765		1.677	0.016	1.644	1.710
Software With All Specified Capacity(b)	0.607	0.023	0.560	0.655		0.760	0.113	0.523	0.996
Software With One or More Limitations(b)	0.378	0.027	0.322	0.433		0.000	0.000	0.000	0.000
Number of Activities Used Computer	8.571	0.088	8.388	8.755		8.598	0.164	8.256	8.941
Most Frequent Training: Telecourse(b)	0.104	0.018	0.066	0.142		0.000	0.000	0.000	0.000
Most Frequent Training: Outside(b)	0.184	0.018	0.147	0.220		0.000	0.000	0.000	0.000
Most Frequent Training: Read HUD(b)	0.197	0.021	0.152	0.241		0.000	0.000	0.000	0.000

Note: (b) represents binary-coded variables.

Attachment 2: Data Editing, Recoding/Rescaling, and Imputation

To cope with missing data existing in the PSQ and Household data sets, we used program-mean imputation (PMI) procedures. As demonstrated with a test, the prior study (see the 2011 HUDQC report, Appendix F, Attachment 2) PMI generated more realistic values relative to multiple imputation method (MI). The comparison was made in imputed mean and standard error across the three program types, where PMI produced values consistently similar to the corresponding statistics from the non-missing cases. Therefore, the current analysis used PMI to remedy missing data from the PSQ variables.

The PMI was also used to deal with missing PSQ data for 31 household records that did not have PSQ data as their affiliated projects failed to respond to the PSQ survey. The rationale for retaining the 31 cases and necessary data imputation is presented in Attachment 1.

Data editing also entailed data transformation, recoding or rescaling to derive predictors or construct composite predictors that may be used in modeling. Essentially, the following types of data editing were conducted:

- To consolidate the information for sensible comparison, two or more data items were combined to measure a same concept. For example, for project size, counts of case-load, and staff of different sort were transformed into rates or ratio (e.g., percent of new certification staff, cases per certification staff). Raw data items for different activities with frequency measures (e.g., most, second most, and third most frequent used verification procedure and computer use for a set of project functions) were combined to build binary-coded indicators that may be more predictive of the rent error (e.g., the telecourse/Web course as the most frequently used training method, number of functions that used computers).
- Multiple-category variables were dummy-coded with one for the focal category and zero for the rest. For example, the failure of checking certification items at either move-in or recertification was coded one and other practices zero, including checking items at either one or both the time points. Note that, frequently, a number of raw data items were used to build categorical variables with further dummy coding.
- Centering: For straightforward interpretation of regression estimates, interval or ratio predictors whose original scale did not contain values were centered on the grand means (i.e., minus the grand mean of the variable from each data point). Six project variables (cases per staff, cases per certification staff, cases per new certification staff, cases per experienced staff, percent of new staff, and percent of experienced staff) and three household variables (household head age, number of bedrooms, and total income) were centered. With centered scaling, the intercept of the regression model is the rent error for households that had grand mean values on the centered predictors (and zero on other predictors). Each regression coefficient estimates the change in rent error associated with one unit change around the grand mean of the given predictor variable.
- Rescaling for easy presentation: a number of interval or ratio variables (e.g., household total income, cases per total staff, cases per certification staff, cases per new certification staff, and cases per experienced certification staff) were converted into large units (e.g.,

$1,000 and 100 cases), such that the regression coefficient estimates would be presented after rounding to the third decimal point as a convention in such presentation. Table 2.1 lists edited variables.

Table 2.1 Rescaled/Centered/Imputed Data Used in the Multivariate Analysis (Weighted n = 2,400, Design Effect Adjusted)

Label	Mean	Standard Error	Lower 95% CL for Mean	Upper 95% CL for Mean
Rent Errors				
Log Gross Error	14.414	1.161	11.993	16.836
Log Overpay	1.074	0.044	0.981	1.166
Log Underpay	0.551	0.035	0.478	0.624
Binary Gross Error of $5 or More	0.399	0.023	0.352	0.446
Project Characteristics				
Public Housing	0.245	0.000	0.244	0.246
PHA-Administered Section 8	0.463	0.001	0.461	0.465
Case per Certification Staff—Centered	0.071	0.191	-0.326	0.469
Percent New Certification Staff—Centered	-1.386	1.170	-3.826	1.054
Percent Experienced Certification Staff—Centered	-0.536	1.148	-2.931	1.859
Percent Staff Left	16.750	1.165	14.321	19.179
Any Non-English Speaking Client(b)	0.707	0.031	0.642	0.772
Require All Three Housing Specific Experiences(b)	0.162	0.025	0.111	0.214
Hiring Requires More Than High School(b)	0.336	0.029	0.276	0.396
Project Operations				
Frequent Training on New Issues(b)	0.843	0.017	0.807	0.879
Average Hours Training All Staff	42.483	2.970	36.288	48.678
Most Frequent Training: Telecourse(b)	0.103	0.018	0.066	0.140
Most Frequent Training: Outside(b)	0.182	0.017	0.146	0.218
Most Frequent Training: Read HUD(b)	86.209	1.459	83.166	89.253
Interact: PH*Training Read HUD	0.049	0.009	0.031	0.067
Average Percent by Person Interview	0.242	0.029	0.182	0.303
Not Checked Item(s) at Either Time(b)	0.157	0.016	0.123	0.190
Most Frequent Verification: Electronic Verification/Data Match(b)	0.054	0.016	0.022	0.087
QC in Certification Process(b)	7.536	0.669	6.140	8.932
Most Frequent Problem: Staffing(b)	0.372	0.027	0.317	0.427
Average Percent by Telephone Interview	8.567	0.088	8.384	8.750
Software With One or More Limitations(b)	0.843	0.017	0.807	0.879
Number of Activities Used Computer	42.483	2.970	36.288	48.678

Table 2.1 Rescaled/Centered/Imputed Data Used in the Multivariate Analysis (Weighted n = 2,400, Design Effect Adjusted) (continued)

Label	Mean	Standard Error	Lower 95% CL for Mean	Upper 95% CL for Mean
Project-Caused Errors				
Percent Items With Transcription Errors	0.222	0.009	0.204	0.240
Percent Items Without Written Third-Party Verification	0.054	0.006	0.042	0.065
Overdue Recertification Error	0.009	0.002	0.004	0.014
Consistence Error	0.176	0.013	0.149	0.202
Procedure Error	0.210	0.012	0.186	0.235
Transcription Error	0.433	0.016	0.399	0.466
Any Calculation Error	0.052	0.006	0.039	0.065
Household Characteristics				
Number of Household Members—Centered	0.054	0.035	-0.019	0.127
Total Annual Income $1,000	13.123	0.351	12.392	13.854
Number of Bedrooms—Centered	0.069	0.032	0.004	0.135
Earned Income	0.390	0.017	0.355	0.426
Other Income	0.223	0.012	0.198	0.247
Public Assistance Income	0.097	0.014	0.068	0.126
Pension Income	1.040	0.047	0.943	1.138
Medical Expense	0.714	0.073	0.562	0.865
Total Number of Sources of Income/Expenses	2.771	0.105	2.552	2.990
Total Number of Allowances	1.216	0.021	1.172	1.260
Household Head Age—Centered	-0.373	0.617	-1.659	0.914
Household With Disabled Elderly	0.572	0.016	0.539	0.606
Moving to Work	0.077	0.024	0.027	0.128

Note: –b represents binary-coded variables.
Source: FY 2012 HUDQC household-level data collection and Project Staff Questionnaire

To consolidate the massive amounts of information collected from the PSQ survey, descriptive, bivariate, and multiple regression statistics were used. Descriptive statistics were examined to filter out data items that lack variation or contain large numbers of missing cases. Bivariate statistics included comparing group means by the rent error indicator for interval/ratio measures and frequency distribution in crosstab with the rent error indicator. Large differences in group means or frequency distribution by the error indicator would suggest a predictive effect of the given variables.

Multiple regression analysis was used in a sequence to test selected predictors grouped by concepts that hypothetically predict rent errors (see Table 2.2). Note that this approach was often used iteratively since many predictors that were initially selected from bivariate tabulations were found useless in multiple regression; thus, additional alternative measures must be explored.

Table 2.2 Testing Project Variables: Regression of Log Gross Rent Error in Sequential Models (Design Effect Adjusted)

Parameter	Model 1		Model 2		Model 3	
Intercept	0.918		1.259	**	0.827	*
Public Housing	0.030		-0.108		-0.152	
PHA-Administered Section 8	0.214		0.110		-0.015	
Case per Certification Staff-Centered	-0.011		-0.011		-0.007	
Case per New Certification Staff-Centered	-0.003		-0.002		-0.005	
Percent Experienced Certification Staff-Centered	0.002		0.002		0.003	
Percent Staff Left	0.001		0.001		0.000	
Any Non-English Speaking Client(b)	0.068		0.065		0.029	
Require All Three Housing Specific Experiences(b)	0.072		0.103		0.051	
Require Background Check(b)	-0.045		-0.026		0.002	
Hiring Requires More Than High School(b)	0.069		0.080		0.076	
Frequent Training on New Issues(b)			-0.283	*	-0.290	*
Average Hours Training All Staff			-0.001		-0.001	
Most Frequent Training: With Senior Staff(b)			-0.014		0.040	
Most Frequent Training: Telecourse(b)			0.112		0.116	
Most Frequent Training: Outside(b)			-0.051		-0.042	
Most Frequent Training: Read HUD(b)			0.118		0.109	
Interact: Public Housing Training and Read HUD			-0.436	*	-0.404	*
Interact: Public Housing Training and Telecourse			-0.346		-0.384	
Average Percent by Person Interview					-0.005	
Not Checked Item(s) at Either Time(b)					0.365	**
Most Frequent Verification: Electronic Verification/Data Match(b)					-0.103	
Most Frequent Verification: Letter to Third Party(b)					0.067	
QC in Certification Process(b)					-0.084	
QC With Formal Key Steps(b)					-0.046	
Most Frequent Problem: Staffing(b)					0.441	*
Average Percent by Telephone Interview					-0.002	
Average Days Processed Before Recertification					0.000	
Formal Guide Interview(b)					0.000	
Number of Certification Monitored Outside Groups					0.069	*
Software With All Specified Capacity(b)					0.072	
Software With One or More Limitations(b)					0.091	
Number of Activities Used Computer					0.046	
R-Square	0.008		0.029		0.033	

Note: (b) represents binary-coded variables.
Source: HUDQC FY 2012 household-level data collection and Project Staff Questionnaire

Attachment 3: Regression Diagnosis: Collinearity and Outlier Identification

Collinearity

When a predictor is a linear combination of other predictors in the model, the coefficient estimates tend to be unstable with large standard errors, a problem known as collinearity or multicollinearity. Regression diagnostic was conducted with household data, generating results largely comparable with earlier studies. Two variables of high collinearity were excluded from the final analysis.

SAS PROC REG was used to generate collinearity diagnostic statistics (TOL, COLLIN, VIF) with the household variables as predictors and log gross error as dependent variable. Overall, collinearity seemed moderate, with only two pairs of variables questionable: The number of household dependents vs. household size and procedure error vs. administrative error, showed significantly high collinearity, each with a VIF greater than 10.0 and large variance accounted for by the given component factor with high index values, according to conventional criteria of acceptable collinearity statistics.[22] Household size was judged to be conceptually more important and was retained in the equation. With the same rationale, administrative error was removed from analysis.

Outliers and Influential Cases

Extreme cases with gross error values drastically different from the rest of the sample, known as outliers, may affect the model fit of least square regression functions. In this study, the problem was more likely due to a different sampling distribution of these cases than to measurement errors. We conducted residual analysis to examine the outliers and decided to remove them from analysis.

Outliers are defined as Y observations whose residuals e_i have substantially different variances $\sigma^2\{e_i\}$ from other observations. We examined the magnitude of each e_i relative to its estimated standard deviation (SD), a ratio of e_i to $s\{e_i\}$, called the studentized residual, to assess differences in the sampling errors of the residuals.

To detect outlying Y observations, we measured the ith residual e_i with the fitted regression based on all of the cases except the ith one. The reason for excluding the ith case is that if Yi is far outlying, the fitted least squares regression function based on all cases, including the ith case, may be influenced to come close to Y_i. In that event, the residual e_i will appear small and will not reveal Y_i as outlying. Excluding the ith case before the regression function is fitted, the least squares fitted value would not be influenced by the outlying Y_i observation and the residual for the ith case will then be realistically large, and therefore, more likely to disclose the outlying Y observation.

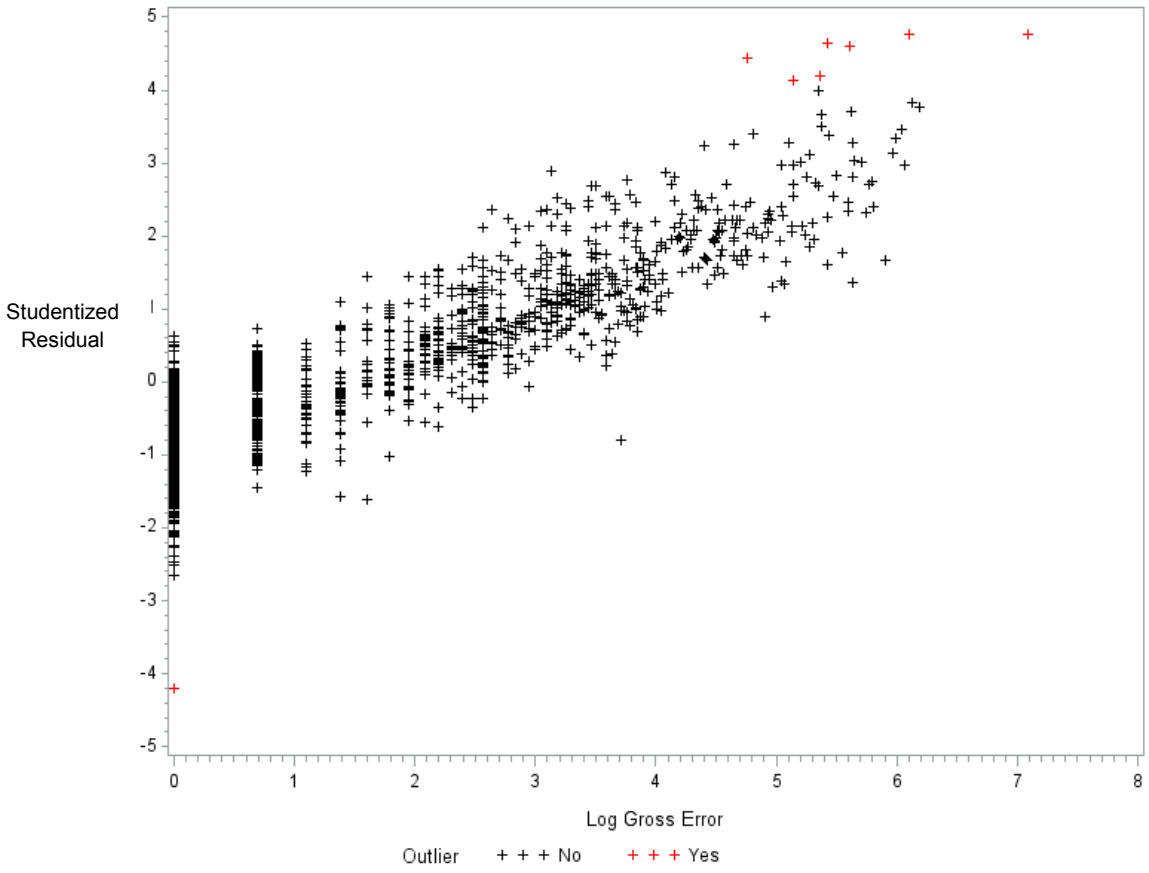
Diagnosis of outlying Y observations entailed deleting and studentizing each case's residual. Each studentized, deleted residual t_i was calculated from the residual e_i, the error sum of squares

[22] See, for example: http://sites.stat.psu.edu/~ajw13/SpecialTopics/multicollinearity.pdf

SSE, and the hat matrix values h_{ii}, all for the fitted regression based on the 2,404 cases in the data set. Each studentized, deleted residual t_i follows the *t* distribution with *n*-*p*-1 degrees of freedom.

We defined as outliers the household records with absolute values of studentized residual greater than 4.0. This was calculated via the Bonferroni test, based on Bonferroni critical value $t(1-\alpha/2n; n-p-1) = 4.0$. Table 3.1 shows the differences in improper payment measures for outliers and the rest of the sample. Figure G-4 chart plots the residual distribution of log gross rent error, with eight outliers shown in red.

Figure G-4 Residual Distributions of Log Gross Error: Correlation of Studentized Residual Score and Log Gross Error



To further check undue bias caused by cases with excessive influence to regression modeling, we examined two statistics generated from residual analysis, known as the leverage and Cook's D. The leverage is a measure of the most influential cases on modeling. Conventionally, a point with leverage greater than (2k+2)/n may deserve a closer look, where k is the number of predictors and n is the number of cases in the sample. In this study, leverage point is (2*22+2)/2404 = .01913. We identified four cases that were high on both studentized residual and leverage.

Cook's D combines the information from the residual and leverage to measure the overall excessiveness of influence on the regression, with values starting from zero, the higher the

Cook's D, the more influential the point, with a conventional cut-off point 4/n, where n=2,404. With Cook's D and the residual and leverage, we identified the same four cases with scores higher than the respective cut-off points.

To test the effect of excluding the four cases on the regression estimation, two models were run with and without the four cases. The results suggested an improvement of model (R-square and adjusted R-square) increased as a result of the dropping the outliers from .226 and .218, respectively, to .236 and .228. Thus, the final modeling excluded the four cases, with a sample of 2,399 households. The rent error indicators were presented in the table below for the outliers in contrast with the remaining sample.

Table 3.1 Measures of Subsidy Rent Errors: Outlier Households and Other Households

Household Type	Subsidy Rent Error	Mean	Standard Error	95% CL for Mean	
Households in the Final Model (n = 2,400)	Gross Error	14.41	1.16	11.99	16.84
	HUD Overpaid	9.49	1.15	7.09	11.89
	HUD Underpaid	4.71	0.45	3.77	5.64
	Log Gross Error	1.07	0.04	0.98	1.17
Outlier Households Defined by Studentized Residual, Leverage, and Cook's D (n= 4)	Gross Error	148.23	78.43	-15.37	311.83
	HUD Overpaid	57.31	62.94	-73.98	188.61
	HUD Underpaid	90.92	26.13	36.42	145.42
	Log Gross Error	4.27	1.43	1.29	7.25

Source: FY 2012 HUDQC household-level data collection and Project Staff Questionnaire

Attachment 4: Proportion of Log Gross Rent Error Variance, Partitioned by Project and Household Levels: Unconditional HLM Model Estimates

Table 4.1 Mixed Model Estimates (Household n=2,400, Project n=554)

Random Effects				
Variance Components	Estimate	Standard Error	Z Value	Pr > Z
Project	0.260	0.045	5.830	<.0001
Residual	4.209	0.134	31.340	<.0001
Total Variance	4.468			
Intra-Class Correlation (Percent Between-Project Variance)	5.8%			
Fixed Effect (DF=553)				
Mean Log Gross Rental Error (Intercept)	1.058	0.038	27.820	<.0001

Source: HUDQC FY 2012 household-level data collection and Project Staff Questionnaire