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Cityscape

A Journal of Policy Development and Research

Policy Issues in Public and Assisted Housing
Volume 10, Number 1 • 2008

U.S. Department of Housing and Urban Development
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The goal of *Cityscape* is to bring high-quality original research on housing and community development issues to scholars, government officials, and practitioners. *Cityscape* is open to all relevant disciplines, including architecture, consumer research, demography, economics, engineering, ethnography, finance, geography, law, planning, political science, public policy, regional science, sociology, statistics, and urban studies.

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PD&R welcomes submissions to the Refereed Papers section of the journal. Our referee process is double blind and timely, and our referees are highly qualified. The managing editor will also respond to authors who submit outlines of proposed papers regarding the suitability of those proposals for inclusion in *Cityscape*. Send manuscripts or outlines to Cityscape@hud.gov.

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Guest Editor's Introduction

Barbara A. Haley
U.S. Department of Housing and Urban Development
Office of Policy Development and Research
Program Monitoring and Research Division

The symposium section in this issue of *Cityscape* represents the second set of articles devoted to research on the 4.3 million households that receive housing assistance from the U.S. Department of Housing and Urban Development (HUD).[1] Assisted housing is found in every metropolitan area and in every state. About 15 percent is in nonmetropolitan areas.[2]

The largest housing assistance program is the Housing Choice Voucher Program (HCVP), formerly known as tenant-based Section 8, in which households are expected to find individual housing units owned by private landlords. Approximately 1.9 million households participate in the HCVP. An additional 1.4 million households live in HUD-subsidized, privately owned multifamily projects, supported by the project-based Section 8 program and other multifamily assisted programs. Slightly under 1 million households live in public housing units that are managed by some 3,200 public housing agencies (PHAs).[3]

Housing assistance programs serve large numbers of vulnerable people. As of 2007, 37 percent of households receiving housing assistance were headed by an elderly person.[4] Another 26 percent were headed by a person who was disabled, but not elderly, and 54 percent were families with children. A small percentage, about 13 percent, fit in none of the categories listed above, such as formerly homeless individuals and people with AIDS.[5]

Policymakers and the public want to know more about how these housing assistance programs perform. Much can be learned from HUD's administrative records, the Housing Choice Voucher Program Customer Satisfaction Survey, and qualitative interviews with participants in the Gautreaux Two Housing Mobility Study.

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[1] The first issue is available at http://www.huduser.org/periodicals/cityscpe/vol8num2/.

[2] The author thanks Mark Perdue for his assistance in producing these estimates. The author also thanks David Chase and Mark Shroder for helpful comments.

[3] Further information about these programs is available at http://www.hud.gov/offices/pih/programs/ph/index.cfm; http://www.hud.gov/offices/pih/programs/hcv/project.cfm; and http://www.hud.gov/offices/pih/programs/hcv/tenant.cfm.

[4] Elderly is defined here as 62 years and older.

[5] Further information about HUD's homeless assistance programs, created by the McKinney-Vento Homeless Assistance Act, and Housing Opportunities for Persons with AIDS is available at http://www.hud.gov/offices/cpd/homeless/ and http://www.hud.gov/offices/cpd/aidshousing/.

In all but one case, the authors of the symposium articles are members of HUD's Research Cadre, which is supported by the Office of Policy Development and Research in order to investigate issues of policy in the administration of housing assistance. (The exception is author Melody Boyd.) *Cityscape* policy allows guest editors wide latitude in choosing symposium articles, as long as all articles meet standards of scholarship, relevance to the mission of HUD, and thematic commonality. As the manager of the contract that funds the Research Cadre and as guest editor for this issue of *Cityscape*, I am favorably impressed by the quality of the articles presented in this issue. I deeply appreciate the cooperation and effort of the authors.

Articles in the Symposium Section of This Issue

The authors bring a variety of theoretical and methodological tools to the research questions posed. One set of articles in this issue focuses on the issue of the extent that various aspects of housing assistance contribute to the goal of deconcentrating poverty. One article addresses the extent that the age mix of children in households that use vouchers affects the longevity of households in this program. Another article explores the extent that census tract indicators of neighborhood quality predict perceptions of neighborhood quality reported by those who use housing vouchers.

Program Dynamics

Carissa G. Climaco, Christopher N. Rodger, Judith D. Feins, and **Ken Lam** investigated "portability" of vouchers in the HCVP. This policy allows a family to use a voucher issued in one jurisdiction to move to another jurisdiction where the program is administered by a different local public housing agency. The authors examined portability moves in the HCVP between 1998 and 2005 and analyzed household and neighborhood characteristics associated with portability moves. They found that, of the 3.4 million households that received housing assistance in the voucher program from 1998 to 2005, 8.9 percent made a portability move. The rate of portability movers was highest among African-American households (10.3 percent), compared with White households (8.1 percent) and Hispanic households (8.6 percent). The authors also found that, compared with households in the HCVP overall, portability movers are more likely to be households with young children and are more likely to have a younger head of household than households that are otherwise similar to them. The authors examined the association between length of stay and portability moves and the timing of portability moves. Most are likely to occur between the fourth and fifth years of HCVP participation. The article examines public housing jurisdictions by program costs. Three-fifths of portability moves were made to lower cost jurisdictions compared with the originating jurisdiction. The data also show reductions in census tract poverty rates for households that completed portability moves.

Melody L. Boyd presents the results of indepth interviews with voucher holders who participated in the Gautreaux Two Housing Mobility Program study. Her respondents were women who used vouchers to move out of segregated, highly concentrated poverty neighborhoods into more affluent areas. This qualitative analysis compares residents who made secondary moves with residents who stayed at their Gautreaux placement addresses, focusing on the role of social networks in making housing decisions. Ms. Boyd reports that secondary movers were motivated by a number of social network factors, including feelings of social isolation in the placement neighborhood, distance

from kin, and transportation difficulties. Conversely, she found that strong social networks were also crucial reasons why some families remained in their Gautreaux neighborhoods or moved on to other similarly advantaged neighborhoods.

Xinhao Wang, David Varady, and **Yimei Wang** used hot spot analysis to measure changes in spatial clustering of HCVP recipients. The authors conducted hot spot analyses of HCVP recipients in eight metropolitan areas (New York, Baltimore, Chicago, Cincinnati, Miami, Houston, Los Angeles, and Phoenix), using a tenant-based data system from HUD's Office of Public and Indian Housing. The 2000 and 2005 hot spots were overlaid with 2000 Census block group data. The hot spot results show that the tendency of HCVP households to cluster varies by metropolitan area. Moreover, no evidence indicates that HCVP clustering is declining. Although HCVP participants are becoming less concentrated in hot spots in Chicago and Phoenix, the opposite is true in other metropolitan areas, especially New York, Cincinnati, and Baltimore. The authors conclude that this type of HCVP concentration is likely to continue as long as affordable rental housing is largely confined to central cities and older inner suburbs.

Meryl Finkel and **Ken Lam** analyzed one outcome of the 1998 Quality Housing Work Responsibility Act (QHWRA), a requirement that PHAs offer the option of a flat rent (as opposed to an income-based rent) to residents of public housing. Flat rents are based on market rents and, therefore, the tenant rent does not vary with income. As of the end of 2005, about 105,000 families were identified on HUD's data system as paying flat rents. The authors found that, although nearly all PHAs have at least some flat-rent units, the proportion of flat-rent units in each PHA is generally small. Households paying flat rent have much higher incomes compared with other public housing residents. Similarly, a much higher percentage of households paying flat rent reported that the majority of their income was from wages, compared with other public housing households. Thus, flat rents appear to be succeeding in allowing residents in these units to increase income through employment and to remain in their units even as their income increases. Rents in units where residents are paying flat rents are substantially higher than in other public housing units. At the same time, households paying flat rents are virtually always paying less than 30 percent of their income for rent. Properties with flat-rent units have a higher degree of income mixing than other properties, which is to be expected, because households in units with flat rents have higher incomes than most other public housing residents have.

Duration of Receipt of Housing Assistance

Alvaro Cortes, Ken Lam, and **David Fein** used HUD administrative data to explore household characteristics that are associated with a household's length of stay in the HCVP. The first is the degree to which the presence of children of varying ages is related to a household's length of stay (longevity) in the program. The second is the degree to which older children, as a potential source of childcare, may mitigate a longer duration of assistance for households containing infants and toddlers. The third is the degree to which disability status of the household head or children affect program longevity. In 1998, PHAs were given considerable discretion to select tenants on the basis of local PHAs' preferences rather than on old federal preferences for households experiencing housing-related hardships. Many PHAs adopted other categorical preferences. As a result, the demographic profile and household composition of tenants have changed. These

changes have important implications for the HCVP, because past research has found that household characteristics, as well as location factors, significantly affect a household's length of stay in the program. The authors found that the median length of stay among nonelderly households with a child or children is about 2.8 years, which is nearly two-thirds of the median (4.4 years) associated with nonelderly households with at least one disabled child. The presence of an infant or toddler increases a household's length of stay in the voucher program, after data are controlled for an array of household and location characteristics, but the presence of other children in the same household attenuates this effect. Conversely, they found that the presence of teenagers, especially boys, magnifies the lengthening of spells associated with infants and toddlers.

Housing Assistance and Neighborhood Quality

Larry Buron and **Satyendra Patrabansh** present the results of a study examining voucher holders' ratings of their neighborhoods in HUD's HCVP Customer Satisfaction Survey. The authors found that voucher holders' neighborhood ratings were consistent with their answers to more specific questions about the attributes of their neighborhoods (that is, they were internally consistent), but that the ratings were only weakly correlated with census-based measures of neighborhood quality. Internal consistency was demonstrated by the strong correlation between neighborhood ratings and voucher holders' perception of crime problems and physical disorder in their neighborhoods. The comparison with census-based measures of the neighborhoods showed that, although a very systematic correlation exists in the expected direction between the neighborhood rating and census measures of the neighborhoods, the correlation was not very strong for any of the census variables tested. The variable with the highest correlation was the percentage of female-headed households with children, but the variable explained less than 5 percent of the variation in tenants' neighborhood ratings. Furthermore, combining multiple census variables into a single neighborhood quality indicator increased the variables' explanatory power by only a small amount.

Conclusion

Changes in the legislation regulating the federal housing assistance programs occur regularly and not always in an atmosphere of clarity and understanding. The Office of Policy Development and Research is pleased to present these articles to the public, in the belief that their information can contribute to informed debate about programs that serve 4.3 million households.

Portability Moves in the Housing Choice Voucher Program, 1998–2005

Carissa G. Climaco
Christopher N. Rodger
Judith D. Feins
Ken Lam
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Abstract

Portability in the Housing Choice Voucher Program (HCVP) enables a household to use a voucher issued in one jurisdiction when moving to another jurisdiction where the program is administered by a different local public housing agency. This article reports the results from a study examining portability moves in the HCVP from 1998 to 2005. Using a specially constructed longitudinal data set developed from U.S. Housing and Urban Development administrative records, the study identifies records that represent portability moves and then analyzes household and neighborhood characteristics associated with portability moves. Of the 3.4 million households that received housing assistance in the voucher program from 1998 to 2005, 8.9 percent made a portability move. The rate of portability movers was highest among African-American households (10.3 percent) compared with White households (8.1 percent) and Hispanic households (8.6 percent). Compared with households in the HCVP overall, portability movers are more likely to comprise households with young children and more likely to have a younger head of household. Length of stay in the HCVP is correlated with portability moves, and portability moves are most likely to occur between the fourth and fifth years of HCVP participation. When examining public housing jurisdictions by program costs, three-fifths of portability moves were made to lower cost jurisdictions compared with the originating jurisdiction. The data also show reductions in census tract poverty rates and other neighborhood indicators for households that completed portability moves.

Introduction

The U.S. Department of Housing and Urban Development's (HUD's) Housing Choice Voucher Program (HCVP) provides program participants with considerable flexibility in choosing their own housing. Participants may decide to use their voucher to continue renting in their current housing unit (lease in place), move to another housing unit in the immediate vicinity, or move to a jurisdiction where the program is administered by a different local public housing agency (PHA). Moves to areas outside the jurisdiction that issued the voucher are permitted under the HCVP's portability provisions.

Research conducted in 2003 on mobility in the HCVP (Feins and Patterson, 2005) determined the extent to which families with children use the voucher to move to another unit and described selected characteristics of the neighborhoods those households chose. This article focuses on the portability of HCVP vouchers and whether portability is an important contributor to mobility in the HCVP. This research extends the methods developed in the mobility study (Feins and Patterson, 2005). Using longitudinal data for the years 1998 to 2005, this study on portability determines the extent to which families use their vouchers to make portability moves.

In this article, we describe the analysis steps undertaken to determine the number of portability moves that occurred from 1998 to 2005. Through a series of tables, we assess the extent of portability moves in the HCVP. The descriptive analysis tables summarize the characteristics of the households that have undertaken portability and the characteristics of the neighborhoods and jurisdictions where portability households lived before and after their moves. The origination or preportability location is where the household lived before making a portability move, and the destination location is where the household lived as a result of completing a portability move. Also, using a logit model, we examine the characteristics of households that undertook a portability move and explore whether households with certain demographic characteristics are statistically more likely to exercise portability in the HCVP.

Data and Sources

The primary data source for this research was longitudinal HCVP data, collected through HUD Form 50058, from HUD's Multifamily Tenant Characteristics System/Public and Indian Housing Information Center (MTCS/PIC) database.[1] Our approach to the data was based on our experience conducting the HCVP geographical mobility study described earlier, and we have used the same approaches to adjust for temporal discontinuities in the data. We have paid particular attention to portability moves that originate in one of the 25 most racially segregated metropolitan statistical areas (MSAs). We have relied on the racial housing pattern analysis that the U.S. Census Bureau produced to identify the 25 most racially segregated MSAs nationally.

[1] The earliest HUD Form 50058 data records were collected through the Multifamily Tenant Characteristics System, and the later HUD Form 50058 data records were collected through the Public and Indian Housing Information Center, Form HUD-50058 submodule. The later data are referred to as "PIC data."

For this research, we have used the following four data sources.

1. *Multifamily Tenant Characteristics System/Public and Indian Housing Information Center database.* The MTCS/PIC database from 1997 to 2005[2] contains nearly 14 million records—3.3 million certificate records and 10.5 million voucher records. The total number of records by year increases steadily, from about 1.1 million in 1997 to 1.9 million in 2005. Each file, consisting of an 18-month snapshot of data taken in December each year, contains a record for each household reported to HUD as receiving tenant-based housing assistance during the 1997-to-2005 period. Households that received assistance continually during this period have one record for each year of program participation, assuming that the relevant housing agency reported the household's data each year. This data set includes selected household characteristics and location data, based on the geocoding of address data. Actual address data, however, were not included in the MTCS/PIC data files. In addition to the MTCS/PIC data files it originally provided for this research, HUD also provided geocoding updates and data based on HUD Form 50058 that specifically deal with portability.[3]

2. *Census 2000 Summary File 3.* Census data were used in the analyses to describe the neighborhood characteristics of HCVP households at origination and destination. Neighborhood descriptors include the percentage of persons who are (1) in poverty, (2) minorities, and (3) African Americans and the percentage of households that are (1) female-headed with children and (2) renters. We compiled these data using the Census 2000 Summary File 3 state files on DVD and merging the census tract data into the MTCS/PIC records using the 2000 Census census tract identifier. In this analysis, we also used a census tract-level data file indicating metropolitan status (central city, suburb, or nonmetropolitan).[4]

   We used census data to create a dissimilarity index to identify the metropolitan areas most segregated by income. This index examined levels of segregation between the estimated number of families with an annual income below 30 percent of metropolitan area median income and families with an annual income of more than $200,000. Based on metropolitan statistical area/primary metropolitan statistical area (MSA/PMSA) definitions of June 30, 1999, we chose the 25 metropolitan areas with the highest income dissimilarity index score and a population of at least 250,000 to compose a list of the metropolitan areas with the highest levels of income segregation. The list of these metropolitan areas appears in the appendix.

[2] The Multifamily Tenant Characteristics System/Public and Indian Housing Information Center database contains records of data snapshots taken from 1997 to 2005. Analysis focused on portability moves made from 1998 to 2005. We used the data from 1997 to help determine if a 1998 action was a portability move.

[3] The questions for the supplemental data from HUD Form 50058 read as follows:
Question 12d: "Did family move into your PHA [public housing agency] jurisdiction under portability? (Y or N)"
Question 12e: "Cost billed per month (put 0 if absorbed)"
Question 12f: "PHA code billed"

[4] We have used a file created by HUD for the HUD National Low Income Housing Tax Credit database, which uses census tract populations to classify each census tract as being located in a metropolitan area central city, a metropolitan area but not in the central city (suburb), or a nonmetropolitan area. Data for Puerto Rico were not available in this data file. Metropolitan areas are defined according to the metropolitan statistical area/primary metropolitan statistical area definitions published June 30, 1999.

3. *Housing Patterns Data, Decennial Census.* To complete the analysis that examines areas with high levels of segregation, we relied on the racial housing pattern analyses produced by the U.S. Census Bureau (Iceland, Weinberg, and Steinmetz, 2002; U.S. Census Bureau, 2005). These analyses produced segregation indices for metropolitan areas using census tracts or block groups as the unit of analysis. For the voucher portability analysis, we chose the most commonly used index, the dissimilarity index. As with the income segregation index, we chose the 25 metropolitan areas with the highest dissimilarity index score and a population of at least 250,000 to compose a list of metropolitan areas with the highest levels of racial segregation. The list of these metropolitan areas appears in the appendix.

4. *Data on PHA Costs Per Unit.* To support analysis of whether portability moves are made to lower or higher cost jurisdictions, HUD provided data on PHA costs per unit. These data, from information in HUD's Voucher Management System, are monthly averages based on data from April 2005 to March 2006. Monthly average costs were derived by totaling subsidy costs and administrative fees, then dividing them by the total number of occupied units (as measured by the unit months of voucher utilization).[5]

Analysis Approach

Analysis included a series of data processing steps to create household-based analytic records, determine if and when a portability move may have occurred, and assess which of the possible portability moves could be confirmed to represent an HCVP portability move.

Accounting for Time Discontinuities

To analyze household data from year to year for this research, we needed continuity in household records. Continuity was important because we wanted to determine portability moves during ongoing participation in the HCVP, as well as portability at entry. We also wanted to more accurately determine the size of the HCVP, as defined by the number of households,[6] during each of the analysis years.

To create a set of analysis records, we selected households and household records with sufficient year-to-year data. We believe that multiyear gaps in program data do not provide sufficiently reliable information; therefore, when a household was missing in two or more consecutive MTCS/PIC reference year files, the household was dropped from the analysis. For households with data gaps of only one reference year file, when the previous and succeeding locations appeared to be the same based on geocoding data, we assumed the household was at the same address during the missing year. When the previous and succeeding census tract identifiers were different, we inferred that a move occurred between the effective dates of the previous and succeeding records, and a

[5] Public housing agencies (PHAs) missing from the PHA Costs Per Unit data file included the 25 PHAs in the Moving to Work Demonstration and other, mostly smaller, housing agencies that have left the Housing Choice Voucher Program or are nonreporting.

[6] We considered using only active households as the basis for determining the size of the Housing Choice Voucher Program (HCVP). Households appear only once in each reference year of data. Although a household's transaction may represent an end of participation, that household was still active in the program at some point in the year. For that reason, we included households coded as leaving the HCVP as an annual participant in the HCVP.

move date was set by interpolation. These moves did not necessarily represent portability moves, although they did indicate a change in household residence location.

Identifying Possible Portability Moves

A key step in these analyses was identifying the possible portability moves. The MTCS/PIC data contain no single item that consistently labeled a record as a portability move, so we needed to evaluate related items and develop a decision rule. The process included a series of tests for a possible portability move. Each test created a flag for the record, tracking the basis for identifying the record as a possible portability move. Following is a description of the series of data steps we took to create flags for possible portability moves.

1. **Signify when the type of action code is a portability move-in.** If the type of action code on HUD Form 50058 indicated a portability move-in, the record was flagged as a possible portability move. The date of the portability move was based on the record's effective date.
2. **Signify when the type of action code is a portability move-out.** If the type of action code indicated a portability move-out, the household's succeeding record was flagged as a possible portability move. The date of the portability move was based on the effective date of the move-out record.
3. **Identify changes in the housing agency code.** If a household record's housing agency code changed from the same household's previous record, the latter record was flagged as a possible portability move. The date of the portability move was based on the effective date of the latter record.
4. **Identify changes in the household's metropolitan area location.** Because of varying sizes of housing agency jurisdictions, changes in census place alone cannot be considered a reliable indicator for identifying a possible portability move;[7] however, changes in metropolitan area or state should be reliable indicators of a portability move. If a household record's metropolitan area changed from the same household's previous record, the latter record was flagged as a possible portability move. The date of the portability move was based on the latter record's effective date. This flag could be created only for successively geocoded records.
5. **Identify changes in the household's state location.** Similarly, if a household record's state changed from the same household's previous record, the latter record was flagged as a possible portability move. The date of the portability move was based on the latter record's effective date. This flag could be created only for successively geocoded records.

   Of special consideration were the instances in which a household exercised portability on admission to the HCVP. According to the HUD Form 50058 instruction booklet, any household that was a new admission should be coded as a new admission, even though the household possibly could be moving into the PHA program through portability. The data steps to identify and flag possible portability moves described earlier may also identify households whose initial unit in the HCVP was a portability move. Other methods used in the study to identify possible portability moves specifically at admission to the HCVP are described next.

[7] For example, a change of place does not imply portability in countywide housing agencies.

6. **Check the new admission records for changes in location based on previous location ZIP Code.** In addition to including the geocoding data representing the household's current location, each record included a ZIP Code that we believe indicated the ZIP Code of the preprogram location. This field was available mostly for the new admission records. Using the Census 2000 files of 5-digit ZIP Code tabulation areas, we determined the state location of the five-digit ZIP Codes. For new admission records that indicated a difference in state based on the preprogram ZIP Code field and the current record's state, the record was flagged as a possible portability move on admission to the HCVP. The date of portability was based on the effective date. This flag could be created only for geocoded records with a state location identified.

7. **Check the new admission record using HUD Form 50058 question 12d.** Another way to determine portability moves upon admission involved using other data from the HUD Form 50058. According to the HUD Form 50058 instruction booklet, any household that was a new admission should be coded as a new admission, even though the household possibly could be moving into the PHA program through portability. Question 12d asks whether the family is or was a portability move-in. For new admission records that indicated "yes" to question 12d, the record was flagged as a possible portability move upon admission to the HCVP. The date of portability was based on the effective date.

Assessing and Confirming Possible Portability Moves

We used those seven tests and criteria to identify possible portability moves. After we created those data flags to indicate the possible moves, we reviewed the data to assess which flag or combination of flags would most reliably indicate a portability move. Our goal was to be able to identify portability moves and count them with considerable certainty.

We supposed that if a portability move record had more than one portability move flag, sufficient reason existed to believe the record was a portability move, but portability move records determined by only one flag merited further review. We had theorized that, for all the portability moves by households continuing in the HCVP, portability move records would be flagged because of a change in housing agency code. In fact, comparing all the portability flags, by far, the largest share of records flagged as possible portability moves included a change in housing agency code. We had also theorized that with a portability move, we would expect to see a change in location and—in most cases—a change in census tract location. After closer review of the intersection of possible portability moves determined by one portability move criterion and whether or not there was a change in census tract location, we noticed that if a possible portability move was flagged only because of the change in housing agency code, no change appeared in census tract location in about 50 percent of the cases.[8]

[8] We have gained some understanding of these results with anecdotal support. We have heard from colleagues familiar with the Housing Choice Voucher Program that, in some statewide programs, agreements have been made with local housing agencies such that the administration of certain household vouchers is transferred to the local agency. A household would not move, but the administering housing agency for it would change—a relatively rare occurrence. For such cases, the year-to-year data would show that the household had not moved; yet, the reporting housing agency for the household would have changed. In this analysis, in that scenario, we would have flagged the housing agency change record as a possible portability move. It is not clear how often these cases can explain our results, but the cases in our analysis do seem to be isolated to certain states, and the change in housing agency codes is for housing agencies in the same state.

The set of records in which the housing agency code changed but the residence location did not change was the only group with possible portability moves that we did not count as portability moves. If three conditions were met—(1) a record was flagged as a possible portability move, (2) the only basis was a change in housing agency code, and (3) there was no change in census tract location—it was likely not a real portability move.

Following is a summary of the decision rules we applied to the possible portability moves before we accepted them as valid portability moves for analysis:

- If the possible portability move was identified by more than one criterion, it was accepted as a portability move.
- If the possible portability move was identified by only one criterion, then—
  - If the single criterion was not the change in housing agency code, it was accepted as a portability move.
  - If the single criterion was the change in housing agency code, then—
    - If the census tract location changed from the previous location, it was accepted as a portability move.
    - If the census tract location did not change from the previous location, it was excluded from the portability move analysis.

Results of Determining HCVP Portability Moves

In exhibit 1, we show the year-by-year results of the decision rules to determine portability moves in the HCVP from 1998 to 2005. Of all 3.4 million households ever in the federal housing voucher program from 1998 to 2005, we estimate that 8.9 percent used their voucher to exercise a portability move to another jurisdiction, counting both initial moves (at admission) and later moves while continuing to receive assistance in the program (after admission). By year, the percentage of households with a portability move appears to be decreasing, from 5.1 percent in 1998 to 1.6 percent in 2005.[9] New admission portability moves occurred for about only 1 percent of all HCVP households during the study period.

Of the households with a portability move from 1998 to 2005, 71.2 percent showed a change in housing agency code. Nearly 40 percent showed a change in metropolitan area code. Records showing a change in state location accounted for 34 percent of those portability move households, and 27.4 percent of portability move households were coded as a portability move-in by their MTCS/PIC record transaction code. Of all portability move households, we estimate that

[9] We have seen in reviewing the Multifamily Tenant Characteristics System/Public and Indian Housing Information Center data that slightly more than 1 percent of the households coded by transaction type exercised portability, both from 1997 to 2005 and in 2005. Because we use not only the transaction codes but also other household record data—including geocodes and location information—to determine a portability move, we expected to find a larger portion of households with portability moves. In fact, the rate has been two to three times greater in most years of the study period.

10.6 percent moved as they entered the HCVP. No trend appeared in the proportion of portability moves occurring at admission from year to year. The percentage of portability moves that were new admissions ranged from 4.9 percent in 1999 to 12.5 percent in 2005.

Exhibit 1

Percent of HCVP Households With Portability Moves During the Year, 1998–2005

	1998	1999	2000	2001	2002	2003	2004	2005	1998–2005
	(thousands)								
Number of HCVP households	1,078	1,310	1,443	1,344	1,627	1,848	1,831	1,718	3,390
All portability moves	(percent)								
Percent with portability moves	5.1	3.4	2.9	2.8	3.4	2.6	2.4	1.6	8.9
Among all portability moves									
Percent portability move-in code	11.7	16.5	22.6	25.8	29.8	36.4	27.5	31.0	27.4
Percent portability move-out code	6.4	6.0	5.9	9.5	12.7	13.0	11.0	NA	9.9
Percent change in housing agency code	44.6	61.9	68.9	75.0	77.4	78.3	83.9	83.3	71.2
Percent change in metropolitan area code	20.9	31.0	36.9	37.7	39.0	44.1	50.5	52.1	38.9
Percent change in state code	50.8	40.7	30.8	24.7	23.0	25.4	29.5	30.0	34.0
Percent current state location differs from preprogram ZIP Code's state location	0.0	0.1	0.1	0.1	0.0	0.0	0.1	0.1	0.1
Percent new admission record with Form 50058 portability flag	9.4	4.8	7.5	8.8	11.3	10.1	9.5	12.5	10.6
Portability moves at admission									
Percent with portability move at admission	0.5	0.2	0.2	0.2	0.4	0.3	0.2	0.2	0.9
Percent of portability moves that were at admission	9.4	4.9	7.6	8.9	11.3	10.1	9.5	12.5	10.6
Portability moves after admission									
Percent with portability moves after admission	4.6	3.3	2.6	2.5	3.0	2.3	2.2	1.4	8.1
Percent of portability moves that were after admission	90.6	95.1	92.4	91.1	88.8	90.0	90.5	87.5	91.4

HCVP = Housing Choice Voucher Program. NA = not available.

Notes: The sum of portability moves at admission and portability moves after admission in the HCVP may not equal the number of total portability moves because households may have completed more than one portability move in a calendar year. Data for the All portability moves *column count households only once by year. Data for the* 1998–2005 *column are based on a nonduplicated count of analysis households during the entire time period.*

Sources: Multifamily Tenant Characteristics System/Public and Indian Housing Information Center data, 1997–2005; Census 2000 Summary File 3

Most portability moves appeared to occur not at admission to the HCVP, but after admission, while a household was already leased up.[10] Portability move households that exercised portability after admission to the voucher program accounted for 91.4 percent of portability move households from 1998 to 2005. The percentage of households exercising portability after admission varied from year to year, but it was lowest in 2005 when 87.5 percent of portability move households were households continuing participation in the HCVP.

In recent years, HUD has used certain HUD Form 50058 data to assess the degree to which households exercise portability in the HCVP (HUD, 2006).[11] According to unpublished numbers provided by HUD from a standard HUD monthly report[12] from February 2006, approximately 111,000 households—representing 6 percent of families that were currently receiving rental assistance—reported ever using portability. These statistics were based on PIC data, counting households who used portability based on data from HUD Form 50058 indicating whether a household had moved into a housing agency jurisdiction under portability. The processes we have used to determine portability moves also used MTCS/PIC data, but they included transaction data and geocoding information to examine portability moves through an 8-year period. As a result of examining and using more data fields, we find somewhat higher rates of portability movement than the standard HUD monthly report suggests.

These two statistics on portability—the first based on this study's estimates of instances of portability and the second based on the HUD Form 50058 indicator of portability showing households in the HCVP that ever ported—are difficult to compare. They are based on different time periods (1998 to 2005 compared with 2005 to 2006) and cover a different set of households (all HCVP households compared with initial and continuing participation households). Still, these statistics are similar in scale. We are confident in our estimates of portability moves, and we have used these records of accepted portability moves for the remainder of the analysis.

HCVP Portability Behavior and Household and Neighborhood Characteristics

In this section, we summarize characteristics of households that have exercised portability in the HCVP from 1998 to 2005. We also discuss neighborhood characteristics associated with portability moves.

[10] A combination of factors could account for the far larger portion of portability moves by continuing households. Of particular interest is whether the 1-year residency rule affects a household's decision to not exercise portability at admission but to use it after initial lease-up in the Housing Choice Voucher Program. With the data available for analysis, we have been unable to determine which households have delayed a portability move because of a 1-year residency rule. Housing agencies typically require that a household that is issued a housing voucher must reside in the housing agency's jurisdiction for at least the first year before porting to another jurisdiction. Households already residing in a housing agency's jurisdiction when a voucher is issued generally are allowed to exercise portability immediately.

[11] According to this guidebook, HUD's statistics on the number of households that have completed portability are based on HUD Form 50058 question 12d.

[12] This Public and Indian Housing Information Center (PIC) Mobility and Portability report, generated within HUD's PIC System, covered a 16-month period, which was the previous 12 months and the succeeding 4 months. In this case, the February 28, 2006, report covers March 1, 2005, to June 30, 2006. Only records with transaction types of new admission, annual reexamination, interim reexamination, portability move-in, and other change of unit are included in this PIC System report.

Exhibit 2 compares rates of portability moves by the race and by the ethnicity of the householder. Each year and for all years, we calculated the percent of White householders, African-American householders, and Hispanic householders in the HCVP that completed a portability move in the study period. White householders and African-American householders could be Hispanic, and Hispanic householders could be of any race. Overall, from 1998 to 2005, the proportion of households with a portability move was highest for African Americans. About 10 percent of households headed by an African-American householder completed a portability move, compared with 8.1 percent of White households and 8.6 percent of Hispanic households. Year by year, the comparative proportions of households by race or ethnicity were similar. The percent of portability moves among African-American households was highest, compared with White households and Hispanic households.

Exhibit 3 shows further data on portability moves by minority voucher holders. Minority voucher holders are defined as households in which the head of the household is African American, American Indian, Alaska Native, Asian, Native Hawaiian, Other Pacific Islander, or Hispanic. In the overall HCVP, minority households comprised 56.8 percent of all voucher households from 1998 to 2005. Higher proportions of minority households comprised portability move households during the same period. Overall, 63.7 percent of portability households were minority households.

To assess whether minority voucher holders moved to neighborhoods with lower rates of minorities, we examined the extent to which the census tract minority rate changed for minority households with a portability move. Overall, with portability moves, the average minority rate decreased from 58.4 percent in the preportability location to 55.8 percent in the portability move location. In fact, in every year from 1998 to 2005, with the exception of 1999, for minority voucher holders the average minority percent decreased from the preportability location to the portability move location.

Exhibit 4 shows our analysis of portability moves by extremely low-income voucher holders, defined as households with an adjusted annual income of less than 30 percent of area median income. The data in this exhibit, which examine the use of portability by extremely low-income

Exhibit 2

Rates of Portability Moves by Race and Ethnicity, 1998–2005

	1998	1999	2000	2001	2002	2003	2004	2005	1998–2005
Percent of White householders with portability moves	4.9	3.3	2.7	2.6	3.0	2.3	2.2	1.5	8.1
Percent of African-American householders with portability moves	5.0	3.6	3.0	3.1	3.9	3.0	2.7	1.8	10.3
Percent of Hispanic householders with portability moves (may be of any race)	4.8	3.3	3.0	2.8	3.1	2.4	2.3	1.5	8.6

Notes: We excluded records with missing data on the race and ethnicity of the head of the household. Data in the 1998–2005 column are based on a nonduplicated count of analysis households during the entire time period. The number of nonduplicated household analysis records included approximately 1.9 million White householders, 1.3 million African-American householders, and 493,000 Hispanic householders.

Source: Multifamily Tenant Characteristics System/Public and Indian Housing Information Center data, 1997–2005

Exhibit 3

Portability Moves by Minority Voucher Holders, 1998–2005, and Changes in Neighborhood Minority Rate

	1998	1999	2000	2001	2002	2003	2004	2005	1998–2005
Percent of portability moves by minority voucher holders	60.0	61.7	63.0	63.4	64.7	66.4	66.3	65.6	63.7
Minorities as a percent of all HCVP households	55.2	57.4	58.3	57.8	59.4	60.6	61.3	61.3	56.8
Average census tract minority rate									
Percent preportability location	60.3	58.6	60.3	59.7	58.8	58.3	56.1	57.1	58.4
Percent portability move location	59.8	59.5	59.4	57.0	54.3	55.0	53.2	51.8	55.8

HCVP = Housing Choice Voucher Program.

Notes: This exhibit includes only the portability moves by households that were not at admission to the HCVP. We excluded portability moves at admission to the HCVP because of a lack of information on the preportability location. We completed the analysis by using records geocoded with 2000 Census census tracts; preportability location and portability move location needed to be different census tracts. We excluded records with missing data on the race and ethnicity of the head of household. Data for the 1998–2005 *column are based on a nonduplicated count of analysis households during the entire time period. The number of nonduplicated household analysis records was approximately 182,000. For the category,* Minorities as a percent of all HCVP households*, the number of nonduplicated household analysis records was approximately 3.3 million.*

Sources: Multifamily Tenant Characteristics System/Public and Indian Housing Information Center data, 1997–2005; Census 2000 Summary File 3

Exhibit 4

Portability Moves by Extremely Low-Income Voucher Holders, 1998–2005, and Changes in Neighborhood Poverty Rate

	1998	1999	2000	2001	2002	2003	2004	2005	1998–2005
Percent of portability moves by extremely low-income voucher holders	89.0	88.5	88.3	87.5	87.9	91.2	90.3	90.4	88.8
Average census tract poverty rate									
Percent preportability location	18.4	18.1	18.7	19.0	18.7	18.7	18.1	18.0	18.5
Percent portability move location	17.7	17.4	17.6	17.0	15.9	15.8	15.6	15.3	16.3

HCVP = Housing Choice Voucher Program.

Notes: This exhibit includes only the portability moves by households that were not at admission to the HCVP. We excluded portability moves at admission to the HCVP because of a lack of information on the preportability location. We completed the analysis by using records geocoded with 2000 Census census tracts; preportability locations and portability move locations needed to be different census tracts. We excluded records with missing data on annual household income. Data for the 1998–2005 *column are based on a nonduplicated count of analysis households during the entire time period. The number of nonduplicated household analysis records was approximately 182,000.*

Sources: Multifamily Tenant Characteristics System/Public and Indian Housing Information Center data, 1997–2005; Census 2000 Summary File 3

voucher holders, indicate, on average, a reduction in the percentage of low-income households between the new tract and the old one. Extremely low-income households made a very large portion of the portability moves. Overall, 88.8 percent of portability households were extremely low-income households. With portability moves, the average poverty rate decreased from 18.5 percent in the

preportability location to 16.3 percent in the portability move location. In every year from 1998 to 2005, the average poverty rate decreased from the preportability location to the portability move location.

Exhibits 5 through 8 present data on the characteristics of households that completed portability moves compared with household characteristics for the HCVP overall. (HCVP household characteristics include portability mover household characteristics.) Exhibit 5 shows the characteristics of the heads of household, including age, race, and ethnicity. We included elderly households in this analysis. On average, portability moves were completed by households with a younger head of household than in the HCVP overall. From 1998 to 2005, on average, the head of household among portability movers was 39.5 years old compared with the head of household in the overall HCVP, which was 43 years old. Portability move householders were also more likely to be African American and less likely to be White. Overall, 45.6 percent of portability households had an African-American head of household, compared with 39.8 percent of HCVP households overall. During the 8-year study period, 51.4 percent of portability move householders were White, compared with 56.6 percent of HCVP householders overall. Portability householders were also more likely to be minority (61.5 percent compared with 56.8 percent in the overall HCVP) and less likely to be Hispanic (14.1 percent compared with 14.8 percent in the overall HCVP).

Exhibit 6 compares the characteristics of portability move households and HCVP households by household type and the presence of children. Most HCVP households have children present. Each year, and overall from 1998 to 2005, portability move households were more likely to be households with children, compared with all HCVP households. Of the portability moves during the analysis period, 58.7 percent were by households with children, but not with an elderly head of household or disabled members. In the overall HCVP, 51 percent of households had children but not an elderly head of household or disabled members.

Exhibit 7 shows the length of time HCVP households have been in the program, defined as the difference between the effective date of the household record in the MTCS/PIC file and the date the household was admitted to the program. Households newer to the program appear somewhat more likely to make portability moves because their median HCVP tenure is about 5.4 months shorter when compared with all HCVP households. Based on our identification of portability movers, the median tenure for mover households in the HCVP was 2.63 years at the time of completing a portability move. From 1998 to 2005, the median tenure of all households in the HCVP was 3.08 years.

Exhibit 8 displays data on sources and levels of household annual income for portability movers and all HCVP households. Portability households are less likely to have wage income and slightly more likely to have welfare income. During the analysis period, 40.5 percent of HCVP households had wage income compared with 33.3 percent of portability movers. Although 24.2 percent of HCVP households had welfare income, 25.8 percent of portability mover households had welfare income. An examination of average income by specified sources, other than welfare, showed that average income was less for the portability households compared with all HCVP households.

Exhibit 5

Portability Households and All HCVP Households, 1998–2005, by Characteristics of Head of Household

	Portability Households									All HCVP Households								
	1998	1999	2000	2001	2002	2003	2004	2005	1998–2005	1998	1999	2000	2001	2002	2003	2004	2005	1998–2005
Head of household	(age)									(age)								
Average age of head of household	40.2	39.9	39.1	39.0	38.5	38.4	38.8	39.8	39.5	43.4	43.6	43.5	43.1	43.4	43.3	43.8	44.4	43.0
Head of household by race	(percent)									(percent)								
White	56.6	53.6	52.6	50.8	48.1	47.6	47.9	49.4	51.4	57.4	55.7	55.0	55.1	54.0	53.2	52.8	53.3	56.6
African American	39.8	43.2	44.6	46.9	49.2	49.7	49.3	48.0	45.6	39.2	41.1	41.9	41.9	42.8	43.2	43.6	43.1	39.8
American Indian/ Alaska Native	1.1	1.0	1.1	0.9	1.0	0.8	1.0	0.8	1.0	0.9	0.8	0.9	0.9	0.9	0.9	0.9	0.9	1.1
Asian/Native Hawaiian/Other Pacific Islander	2.5	2.2	1.7	1.3	1.7	1.8	1.9	1.9	1.9	2.5	2.3	2.2	2.1	2.2	2.6	2.7	2.8	2.5
Hispanic householder	(percent)									(percent)								
Percent Hispanic	13.5	14.1	15.4	14.4	13.6	14.1	14.6	14.7	14.1	13.9	14.6	14.7	14.2	14.8	15.2	15.5	16.0	14.8
Minority householder	(percent)									(percent)								
Percent minority	55.6	59.3	61.5	62.4	64.3	65.2	65.5	64.2	61.5	55.2	57.4	58.3	57.8	59.4	60.6	61.3	61.3	56.8

HCVP = Housing Choice Voucher Program.

Notes: We excluded from the applicable analysis records with missing data on the age, race, or ethnicity of the head of household. Data for the 1998–2005 *column are based on a nonduplicated count of analysis households during the entire time period. The number of nonduplicated portability household analysis records was approximately 301,000. The number of nonduplicated HCVP household analysis records was approximately 3.3 million.*

Source: Multifamily Tenant Characteristics System/Public and Indian Housing Information Center data, 1997–2005

Exhibit 6

Portability Households and All HCVP Households, 1998–2005, by Household Types and Presence of Children

	Portability Households									All HCVP Households								
	1998	1999	2000	2001	2002	2003	2004	2005	1998–2005	1998	1999	2000	2001	2002	2003	2004	2005	1998–2005
Type of household	(percent)									(percent)								
Elderly, no children	10.3	9.4	8.4	7.8	7.1	7.2	7.7	8.7	8.8	15.5	15.6	15.4	14.7	14.9	14.7	15.1	15.9	14.7
Disabled, no children	13.1	13.3	12.6	14.5	13.6	14.0	13.8	15.3	13.8	14.2	14.3	13.4	16.1	16.6	16.7	17.0	17.5	15.2
Other, no children	18.1	13.9	11.8	7.9	6.0	6.3	6.3	6.5	10.2	12.1	10.3	10.9	9.7	8.3	8.6	8.9	9.1	11.7
Elderly with children	0.6	0.7	0.7	0.9	0.9	0.8	0.8	0.9	0.8	0.9	1.0	1.0	0.9	1.0	1.0	1.0	1.0	0.9
Disabled with children	5.7	6.3	2.9	8.8	9.5	9.5	9.6	10.1	7.7	6.1	5.9	2.3	7.3	7.7	7.7	7.8	7.8	6.5
Other with children	52.1	56.4	63.6	60.1	62.8	62.1	61.7	58.5	58.7	51.1	53.0	57.0	51.4	51.6	51.3	50.1	48.6	51.0
Children present, by age	(percent)									(percent)								
0–3 years	20.2	21.8	25.4	26.2	27.7	28.1	27.4	25.1	24.5	18.1	19.2	20.4	20.8	21.0	21.2	19.9	18.6	20.4
4–5 years	15.5	16.5	17.7	18.2	19.5	20.4	20.4	19.6	18.0	13.9	14.0	13.8	13.8	14.2	14.6	14.6	14.2	14.6
6–12 years	38.7	42.5	43.9	45.5	47.4	46.3	46.3	45.1	43.6	37.1	37.9	37.7	36.6	36.7	36.1	35.7	34.8	34.7
13–17 years	21.6	23.4	23.5	25.7	27.4	26.7	27.7	27.9	25.3	23.5	24.1	23.8	23.2	24.1	24.1	24.7	24.8	22.9
Any child under 18 years	58.5	63.4	67.2	69.8	73.2	72.5	72.2	69.5	67.2	58.1	59.8	60.3	59.6	60.3	60.0	59.0	57.4	58.4

HCVP = Housing Choice Voucher Program.

Notes: We excluded from the applicable analysis records with missing data on type of household. Data for the 1998–2005 *column are based on a nonduplicated count of analysis households during the entire time period. The number of nonduplicated portability household analysis records was approximately 301,000. The number of nonduplicated HCVP household analysis records was approximately 3.3 million.*

Source: Multifamily Tenant Characteristics System/Public and Indian Housing Information Center data, 1997–2005

Exhibit 7

Portability Households and All HCVP Households by Length of Time in the HCVP, 1998–2005

	Portability Households									All HCVP Households								
	1998	1999	2000	2001	2002	2003	2004	2005	1998–2005	1998	1999	2000	2001	2002	2003	2004	2005	1998–2005
Time in program	(years)									(years)								
Average	2.48	2.62	3.15	3.79	3.83	3.92	4.48	5.04	3.70	4.13	4.44	4.58	4.51	4.66	4.73	5.14	5.53	4.71
Median	1.50	1.82	2.17	2.76	2.81	2.83	3.33	3.95	2.63	2.89	3.00	3.00	3.00	3.04	3.00	3.49	4.00	3.08

HCVP = Housing Choice Voucher Program.

Notes: For this analysis, the minimum amount of time in the HCVP was 0 years, and the maximum amount of time in the HCVP was 30 years. We excluded values out of this range caused by invalid or missing data on program admission date or effective date of the record. Data for the 1998–2005 *column are based on a nonduplicated count of the analysis households during the entire time period. The number of nonduplicated portability household analysis records was approximately 280,000. The number of nonduplicated HCVP household analysis records was approximately 3.1 million.*

Source: Multifamily Tenant Characteristics System/Public and Indian Housing Information Center data, 1997–2005

Exhibit 8

Portability Households and All HCVP Households, 1998–2005, by Sources and Levels of Household Income

	Portability Households									All HCVP Households								
	1998	1999	2000	2001	2002	2003	2004	2005	1998–2005	1998	1999	2000	2001	2002	2003	2004	2005	1998–2005
Source of income	(percent)									(percent)								
Wages	32.2	30.8	32.8	31.5	33.5	32.8	34.2	33.2	33.3	37.6	38.1	38.6	36.9	36.9	37.9	38.1	38.6	40.5
Welfare	26.9	23.9	23.9	23.0	25.2	28.1	30.4	32.0	25.8	25.4	22.1	20.5	18.4	19.3	21.7	26.1	29.3	24.2
SSI	22.1	23.4	25.3	26.7	27.9	29.7	29.2	31.2	26.6	26.4	27.4	28.2	27.4	29.3	30.7	31.4	31.9	27.5
SS/pension	20.5	20.4	21.5	22.1	22.3	23.5	24.8	27.4	22.9	27.7	27.7	28.0	27.1	28.1	29.0	29.8	30.9	27.7
Other source of income	18.7	17.6	19.1	21.4	26.1	29.5	31.5	31.9	24.4	20.8	18.9	19.4	20.1	22.7	25.2	27.1	28.6	25.7
Average annual income by source	(US$)									(US$)								
Wages	12,624	12,618	13,039	13,311	13,948	13,860	14,148	14,483	13,601	12,199	12,374	12,757	13,046	13,332	13,605	14,025	14,473	14,620
Welfare	4,938	4,726	4,848	4,851	4,898	4,960	5,063	5,020	4,906	4,422	4,324	4,340	4,350	4,414	4,443	4,457	4,351	4,399
SSI	5,711	5,656	5,812	6,019	6,302	6,627	6,587	6,613	6,199	5,390	5,434	5,543	5,719	5,964	6,190	6,363	6,496	6,244
SS/pension	7,191	6,920	7,008	7,217	7,435	7,485	7,759	7,914	7,443	7,220	7,167	7,295	7,527	7,749	7,920	8,137	8,383	8,185
Other source of income	3,536	3,889	3,985	4,253	4,640	4,743	4,606	4,599	4,375	3,316	3,711	3,847	4,027	4,353	4,458	4,386	4,409	4,325

HCVP = Housing Choice Voucher Program.

Notes: We excluded source values of 0 in the Average annual income by source *category. Dollar values were not adjusted for inflation. Data for the* 1998–2005 *column are based on a nonduplicated count of analysis households during the entire time period. The number of nonduplicated household analysis records was approximately 294,000. The number of nonduplicated HCVP household analysis records was approximately 3.3 million.*

Source: Multifamily Tenant Characteristics System/Public and Indian Housing Information Center data, 1997–2005

Exhibit 9 shows data on how far participants typically move when exercising portability. Distance calculations were completed using the latitude and longitude data provided in the MTCS/PIC data. Because we found portability moves that appeared not to represent a change in residence location, we decided to limit the distance calculations to moves of at least one-quarter mile. This same rule was used in the HCVP mobility study (Feins and Patterson, 2005) to determine household moves. We also restricted this analysis to portability moves within the 48 contiguous United States; thus, we excluded portability moves to or from Alaska, Hawaii, or Puerto Rico in this analysis.

With these restrictions, we have estimated the average portability move to be more than 200 miles, with a median distance of 25 miles. About one-third of these portability moves were of at least 100 miles; however, 19.4 percent of households overall made portability moves of less than 5 miles, 13.7 percent made moves of between 5 and 10 miles, and 16.9 percent made moves of between 10 and 25 miles.

Exhibit 10 compares portability moves by geographic jurisdiction, including the percentages that were moves between metropolitan areas and between states. The HCVP primarily operates in metropolitan areas. When examining the portability moves within metropolitan areas, we observed that households that exercised portability were more likely to stay in the same metropolitan area. More than 40 percent of portability moves were within the same metropolitan area, although a marked decline was apparent in the proportion of moves, 46.0 to 36.6 percent, within the same metropolitan area from 1998 to 2005. During the period covered by the study, 37.3 percent of

Exhibit 9

Portability Moves by Distance, 1998–2005

	1998	1999	2000	2001	2002	2003	2004	2005	1998–2005
Distance moved	(miles)								
Average	196	205	221	223	218	230	229	243	219
Median	19	21	24	28	27	28	28	31	25
Range	(percent)								
0.25 to 4.99 miles	25.8	23.7	20.8	18.7	17.7	16.7	17.7	15.8	19.4
5 to 9.99 miles	13.5	13.8	13.5	12.8	13.8	13.6	13.5	13.5	13.7
10 to 24.99 miles	15.2	15.6	16.1	17.0	17.5	17.9	17.0	17.5	16.9
25 to 49.99 miles	8.5	8.7	8.7	9.9	9.7	9.3	9.2	9.6	9.3
50 to 99.99 miles	8.2	7.8	8.4	8.7	8.2	8.5	8.6	8.5	8.4
100 miles or more	28.8	30.4	32.6	32.8	33.0	33.9	34.0	35.0	32.3

Notes: This exhibit includes only the portability moves by households that were not at admission to the Housing Choice Voucher Program (HCVP). We excluded portability moves at admission to the HCVP because of a lack of information on the preportability location. We completed the analysis using records geocoded with 2000 Census census tracts; preportability location and portability move location needed to be different census tracts. Distance moved was based on calculations using the latitude and longitude data for geocoded records. Only moves within the 48 contiguous United States and of at least one-quarter mile are included in these calculations. Data for the 1998–2005 *column are based on a nonduplicated count of analysis households during the entire time period. The number of nonduplicated household analysis records was approximately 144,000.*

Sources: Multifamily Tenant Characteristics System/Public and Indian Housing Information Center data, 1997–2005; Census 2000 Summary File 3

Exhibit 10

Portability Moves by Geographic Jurisdiction, 1998–2005

	1998	1999	2000	2001	2002	2003	2004	2005	1998–2005
	(percent)								
Within same metropolitan area	46.0	44.8	41.8	39.8	40.7	40.3	39.0	36.6	41.3
Metropolitan area to different metropolitan area	32.6	33.6	36.6	37.7	37.9	39.6	40.2	43.0	37.3
Metropolitan area to nonmetropolitan area	6.3	6.1	6.4	6.1	5.5	5.2	5.6	6.8	5.8
Nonmetropolitan area to metropolitan area	9.0	9.7	9.3	10.2	10.5	10.4	10.4	9.2	10.2
Nonmetropolitan area to nonmetropolitan area	6.0	5.8	5.8	6.2	5.5	4.5	4.8	4.5	5.5
Change in state	25.6	27.1	28.8	30.2	30.0	30.8	30.9	32.2	29.2

Notes: This exhibit includes only the portability moves by households that were not at admission to the Housing Choice Voucher Program (HCVP). We excluded portability moves at admission to the HCVP because of a lack of information on the preportability location. We completed the analysis using records geocoded with 2000 Census census tracts; preportability location and portability move location needed to be different census tracts. Data for the 1998–2005 *column are based on a nonduplicated count of analysis households during the entire time period. The number of nonduplicated household analysis records was approximately 146,000.*

Sources: Multifamily Tenant Characteristics System/Public and Indian Housing Information Center data, 1997–2005; Census 2000 Summary File 3

households making portability moves changed from one metropolitan area to another; the proportion of households moving from one metropolitan area to another in that period increased.

Portability households were more likely to move from a nonmetropolitan area to a metropolitan area than from a metropolitan area to a nonmetropolitan area. Each year and overall, about 10 percent of portability movers moved from a nonmetropolitan area to a metropolitan area and about 6 percent moved in the other direction. Portability moves within and among nonmetropolitan areas equaled 5.5 percent of portability households from 1998 to 2005.

Portability moves across state boundaries can involve a portability move of any kind. (That is, they can originate in a metropolitan area and then move within the same metropolitan area, move to a different metropolitan area, or move to a nonmetropolitan area; or, they can originate in a nonmetropolitan area and then move to a metropolitan area or another nonmetropolitan area.) When examining the last row of exhibit 10, moves between states also appears to have increased from 1998 to 2005. In 1998, 25.6 percent of households completing a portability move went from one state to another; by 2005, 32.2 percent of households completing a portability move went from one state to another. For the full study period, slightly more than 29 percent of households completing a portability move crossed state boundaries with their portability moves.

Exhibit 11 focuses on the portability moves within the same metropolitan area, across different metropolitan areas, and involving nonmetropolitan areas by examining city locations compared with suburb locations. (The summed proportions of portability moves by categories shown in exhibit 11 may differ slightly from exhibit 10 because data on central city, suburb, and

Exhibit 11

Portability Moves by Geographic Jurisdiction and Central City and Suburban Areas, 1998–2005

	1998	1999	2000	2001	2002	2003	2004	2005	1998–2005
Within the same metropolitan area					(percent)				
Central city to central city	14.5	12.1	10.1	8.9	7.7	7.2	7.0	5.6	8.9
Central city to suburb	8.0	8.8	8.3	7.7	6.9	8.4	8.2	7.6	8.1
Suburb to central city	9.6	10.5	11.0	10.5	12.5	11.7	11.8	11.2	11.3
Suburb to suburb	13.6	13.4	12.7	12.6	13.6	13.1	12.1	12.1	12.9
Across different metropolitan areas					(percent)				
Central city to central city	11.5	11.9	12.7	12.7	12.7	13.1	12.2	12.9	12.2
Central city to suburb	6.2	6.8	6.8	6.7	6.2	6.8	7.6	8.2	6.8
Suburb to central city	8.7	7.9	9.6	10.2	10.9	11.2	11.1	11.9	10.2
Suburb to suburb	6.4	6.9	7.5	8.2	8.0	8.6	9.3	10.0	8.2
Involving nonmetropolitan locations					(percent)				
Central city to nonmetropolitan area	5.2	5.8	5.5	5.8	5.9	5.6	5.5	4.8	5.7
Suburb to nonmetropolitan area	3.9	4.0	4.0	4.4	4.6	4.8	4.9	4.4	4.5
Nonmetropolitan area to central city	3.5	3.3	3.2	3.3	2.9	2.6	2.8	3.1	2.9
Nonmetropolitan area to suburb	2.9	2.8	2.8	2.8	2.6	2.6	2.9	3.7	2.8
Nonmetropolitan area to nonmetropolitan area	6.1	5.9	5.9	6.2	5.5	4.5	4.8	4.5	5.5

Notes: This exhibit includes only the portability moves by households that were not at admission to the Housing Choice Voucher Program (HCVP). We excluded portability moves at admission to the HCVP because of a lack of information on the preportability location. We completed the analysis using records geocoded with 2000 Census census tracts; preportability location and portability move location needed to be different census tracts. Data on central city, suburb, and nonmetropolitan areas in Puerto Rico were unavailable for this analysis. Within the same metropolitan area, a portability move from central city to central city may be a portability move within the same city. A suburb is a location within a metropolitan area that is not part of a central city. Data for the 1998–2005 *column are based on a nonduplicated count of analysis households during the entire time period. The number of nonduplicated household analysis records was approximately 146,000.*

Sources: Multifamily Tenant Characteristics System/Public and Indian Housing Information Center data, 1997–2005; Census 2000 Summary File 3

nonmetropolitan areas in Puerto Rico were not compiled and available for this analysis.) In this analysis, a suburb location is any area in a metropolitan area that is not a central city. Across all types of portability moves, voucher households were most likely to move from a suburb location to a suburb location within the same metropolitan area. Nearly 13 percent of portability moves were between suburb locations in the same metropolitan area. The next most likely type of move was across different metropolitan areas, from one central city to another. Slightly more than 12 percent of portability moves were between central cities in different metropolitan areas.

Some trends are evident in exhibit 11 across the categories of portability moves by geographic jurisdiction and by central city and suburb locations. As noted earlier, from 1998 to 2005 the proportion of portability moves occurring within the same metropolitan area decreased. Much of the decrease appears in moves from a central city location to a central city location within the

same metropolitan area. These moves decreased from 14.5 percent of all portability moves in 1998 to 5.6 percent of all portability moves in 2005. The only type of portability moves that increased within the same metropolitan area involved suburb-to-central city moves, which increased from 9.6 percent in 1998 to 11.2 percent in 2005.

Portability moves across metropolitan areas generally increased from 1998 to 2005, including increases for all types of central city and suburb portability moves. Portability moves that crossed metropolitan area boundaries increased from 6.4 to 10.0 percent across suburb locations, from 8.7 to 11.9 percent from suburb areas to central cities, from 6.2 to 8.2 percent from central cities to suburb areas, and from 11.5 to 12.9 percent from one central city to another central city.

Using Census 2000 data at the census tract level, we show in exhibit 12 the neighborhood characteristics of the preportability location and portability move location. We reported similar data in previous analysis tables for certain groups of portability movers, including minority households and households with extremely low incomes. Those analyses, when compared with the preportability location, showed that the average census tract poverty rate and average minority rate were lower in the portability move location. Similar results appear in the tabulation for all portability movers. Exhibit 12 compares the census tract poverty rate and minority rate of the preportability location and portability move location. On average, from 1998 to 2005, the census tract poverty rate decreased from 18.3 to 16.3 percent with a portability move. Average poverty rates in the portability move locations decreased from 17.6 percent in 1998 to 15.3 percent in 2005. The average minority rate decreased from 45.9 to 43.8 percent. No consistent increase or decrease in the average census tract minority rate in the preportability locations is apparent across the analysis period, although, for the most part, the minority rate decreased from year to year with the portability locations.

When we compared the preportability locations to the portability move locations during the study period, we found the neighborhood average percentage of families headed by a single female decreased from 26.9 to 25.4 percent. When examining only the portability move locations from 1998 to 2005, we found that the census tract average percentage of families headed by a single female decreased from 26.2 to 24.4 percent. The average percentage of renter-occupied units decreased from 47.5 percent in the preportability location to 44.6 percent in the portability move location. When we analyzed the portability move locations from 1998 to 2005, we found that the census tract average percentage of renter-occupied units decreased from 46.4 to 43.0 percent.

Overall, it appears that HCVP households that have exercised a portability move have been able to move to somewhat better neighborhoods with lower rates of poverty and lower concentrations of minorities and families headed by single females. The new destination neighborhoods for HCVP households also have had lower concentrations of renter-occupied units. In fact, portability households were moving to continuously better neighborhoods from 1998 to 2005, although, overall, the magnitude of these changes was small.

Exhibit 12

Neighborhood Characteristics: Preportability Locations and Portability Move Locations, 1998–2005

	Preportability Location									Portability Move Location								
	1998	1999	2000	2001	2002	2003	2004	2005	1998–2005	1998	1999	2000	2001	2002	2003	2004	2005	1998–2005
Poverty rate																		
Average	18.5	18.0	18.6	18.8	18.5	18.5	18.0	17.6	18.3	17.6	17.3	17.5	17.0	15.9	15.8	15.5	15.3	16.3
Minority rate																		
Average	46.9	45.7	47.2	46.6	46.6	46.8	45.0	44.4	45.9	45.1	45.7	46.1	44.7	43.2	44.2	42.7	41.3	43.8
Percent of families headed by a single female																		
Average	26.6	26.5	27.2	27.1	27.5	27.6	26.7	26.4	26.9	26.2	26.5	26.5	25.9	25.2	25.2	24.8	24.4	25.4
Percent of renter-occupied units																		
Average	48.2	47.3	48.3	47.8	47.7	48.1	47.0	47.1	47.5	46.4	46.3	46.3	45.6	44.4	44.2	43.5	43.0	44.6

Notes: This exhibit includes only the portability moves by households that were not at admission to the Housing Choice Voucher Program (HCVP). We excluded portability moves at admission to the HCVP because of a lack of information on the preportability location. We completed the analysis using records geocoded with 2000 Census census tracts; preportability location and portability move location needed to be different census tracts. Data for the 1998–2005 column are based on a nonduplicated count of analysis households during the entire time period. The number of nonduplicated household analysis records was approximately 181,000.

Sources: Multifamily Tenant Characteristics System/Public and Indian Housing Information Center data, 1997–2005; Census 2000 Summary File 3

HCVP Portability Moves and Area Characteristics

In this section, we discuss some additional analyses of portability moves made from 1998 to 2005. We examine the portability moves originating in the 25 metropolitan areas most highly segregated by race and the portability moves originating in the 25 metropolitan areas most segregated by income. We also examine portability moves in relation to local area HCVP subsidy costs.

Portability Moves in Racially Segregated MSAs

Exhibit 13 shows information about portability moves by voucher holders who were initially located in one of the 25 U.S. metropolitan areas most segregated by race. As described earlier, to complete this analysis we relied on the racial housing pattern analyses produced by the U.S. Census Bureau (Iceland, Weinberg, and Steinmetz, 2002). Those analyses produced segregation indices for metropolitan areas, using census tracts or block groups as the unit of analysis. We chose the most commonly used index, the dissimilarity index. Exhibit A-1 lists the 25 metropolitan areas with the highest dissimilarity index scores based on racial segregation of African Americans and a metropolitan area population of at least 250,000.

Portability moves by households originally living in these 25 metropolitan areas accounted for 14.6 percent of all portability moves from 1998 to 2005. To assess whether these households move to more or less segregated areas, we examined the minority rate and percentage of African Americans in the preportability locations compared with the portability move locations. For both measures,

Exhibit 13

Portability Moves by Voucher Holders Initially Located in One of the 25 Metropolitan Areas Most Segregated by Race, 1998–2005, and Changes in Neighborhood Minority Rate and Percentage of African Americans

	1998	1999	2000	2001	2002	2003	2004	2005	1998–2005
Percent of portability moves by voucher holders in highly segregated metropolitan areas	14.6	11.9	14.1	13.7	15.4	15.1	14.9	16.9	14.6
Average census tract minority rate									
Percent preportability location	61.0	56.4	62.9	65.9	67.1	65.5	62.3	63.2	63.3
Percent portability move location	52.3	52.6	54.9	51.9	51.4	51.8	49.0	48.5	51.0
Average census tract percent African American									
Percent preportability location	38.6	37.0	40.8	39.7	42.0	43.0	40.0	38.8	40.0
Percent portability move location	31.9	33.3	34.8	32.3	31.6	32.4	29.3	28.4	31.3

Notes: This exhibit includes only the portability moves by households that were not at admission to the Housing Choice Voucher Program (HCVP). We excluded portability moves at admission to the HCVP because of a lack of information on the preportability move location. We completed the analysis using records geocoded with 2000 Census census tracts; preportability location and portability move location needed to be different census tracts. Exhibit A-1 lists the 25 most segregated metropolitan areas by race used in this analysis. Data for the 1998–2005 *column are based on a nonduplicated count of analysis households during the entire time period. The number of nonduplicated household analysis records was approximately 182,000.*

Sources: Multifamily Tenant Characteristics System/Public and Indian Housing Information Center data, 1997–2005; Census 2000 Summary File 3; Housing Patterns Data, 2000 Decennial Census

rates consistently decreased each year and overall. The overall average minority rate decreased from 63.3 to 51.0 percent. The overall average percentage of African Americans decreased from 40.0 to 31.3 percent. In general, it appears that the households porting from highly segregated areas moved to less segregated neighborhoods, shown by the decrease in census tract minority rate.

Considering that this analysis focuses on areas that are highly segregated by race, it is not surprising that the overall average minority rate for the preportability location and portability move location in highly segregated areas is higher than the same measures for portability movers in all areas. The average minority rate for all portability households decreased from 45.9 percent in the preportability location to 43.8 percent in the portability move location (exhibit 12). The average census tract minority rate for portability move locations of households originating in one of the highly segregated areas was still much higher than even the preportability locations of porting households overall.

In exhibit 14, we examine more specifically the minority households in these highly segregated metropolitan areas. About 80 percent of portability move households in areas that are highly segregated by race were headed by minority group members.

Distinct changes in the minority rate are apparent when examining preportability locations and portability move locations. Exhibit 14 includes data on portability households that originated in one of the 25 metropolitan areas highly segregated by race, but the exhibit does not control for the portability move location. In other words, although a household in this analysis may have started in a highly segregated area, the household could have ported to an area that was not highly segregated. For minority households originating in one of the 25 metropolitan areas segregated by race, the average minority rate in the preportability location was 71.7 percent. As shown in exhibit 3, for all minority households, the average minority rate in the preportability location was 58.4 percent. The average minority rate of portability move locations for minority households originating in one

Exhibit 14

Portability Moves by Minority Voucher Holders Initially Located in One of the 25 Metropolitan Areas Most Segregated by Race, 1998–2005, and Changes in Neighborhood Minority Rate

	1998	1999	2000	2001	2002	2003	2004	2005	1998–2005
Percent of portability moves by minority voucher holders in highly segregated metropolitan areas	77.2	77.1	80.4	79.7	81.7	82.1	81.1	81.0	79.8
Average census tract minority rate									
Percent preportability location	71.0	66.6	71.2	74.1	74.6	72.9	69.8	71.4	71.7
Percent portability move location	61.2	62.4	62.4	58.2	57.4	57.5	54.9	54.5	57.9

Notes: This exhibit includes only the portability moves by households that were not at admission to the Housing Choice Voucher Program (HCVP). We excluded portability moves at admission to the HCVP because of a lack of information on the preportability location. We completed the analysis using records geocoded with 2000 Census census tracts; preportability location and portability move location needed to be different census tracts. Exhibit A-1 lists the 25 most segregated metropolitan areas by race used in this analysis. We excluded records missing data on the head of household race and ethnicity. Data for the 1998–2005 *column are based on a nonduplicated count of analysis households during the entire time period. The number of nonduplicated household analysis records was approximately 21,000.*

Sources: Multifamily Tenant Characteristics System/Public and Indian Housing Information Center data, 1997–2005; Census 2000 Summary File 3

of the highly segregated areas was 57.9 percent, and, for minority households overall, the average minority rate in the portability move locations was 55.8 percent. Compared with the large difference in the minority rates in the preportability locations, the minority rates in the portability move locations were similar.

Minorities who ported from all areas and minorities who ported from areas highly segregated by race could, with portability, move to neighborhoods with similar average minority rates (although the households from the highly segregated areas appear to have moved to areas with slightly higher rates of minorities).

Portability Moves in MSAs Segregated by Income

In this section, we use a different measure of segregation, namely segregation by income, to discuss our analysis. We calculated this metropolitan area segregation index using Census 2000 census tract data on families. Using a dissimilarity index, we measured levels of segregation for low-income and high-income families. We defined low-income families as having an annual income of less than 30 percent of the metropolitan area median income. We defined high-income families as having an annual income of more than $200,000. Exhibit A-2 lists the 25 metropolitan areas with the highest levels of segregation by income.

Exhibit 15 shows the change in the neighborhood poverty rate for porting households that originated in one of the 25 metropolitan areas with the highest levels of segregation by income. From 1998 to 2005, 21.9 percent of households completing portability moves originated in one of those metropolitan areas. The average neighborhood poverty rate in the originating location was 20.6 percent, and the average neighborhood poverty rate in the portability move location was 17.2 percent. These average poverty rates are higher than the neighborhood poverty rates for portability movers

Exhibit 15

Portability Moves by Voucher Holders Initially Located in One of the 25 Metropolitan Areas Most Segregated by Income, 1998–2005, and Changes in Neighborhood Poverty Rate

	1998	1999	2000	2001	2002	2003	2004	2005	1998–2005
Percent of portability moves by voucher holders in highly segregated metropolitan areas	24.7	20.8	22.2	22.0	21.4	21.9	21.5	22.5	21.9
Average census tract poverty rate									
Percent preportability location	21.5	20.1	20.9	21.0	21.0	20.5	19.7	20.4	20.6
Percent portability move location	19.8	19.4	19.1	18.0	16.6	16.4	15.7	15.7	17.2

Notes: This exhibit includes only the portability moves by households that were not at admission to the Housing Choice Voucher Program (HCVP). We excluded portability moves at admission to the HCVP because of a lack of information on the preportability location. We completed the analysis using records geocoded with 2000 Census census tracts; preportability location and portability move location needed to be different census tracts. Exhibit A-2 lists the 25 most segregated metropolitan areas by income used in this analysis. We excluded records missing data on annual household income. Data for the 1998–2005 *column are based on a nonduplicated count of analysis households during the entire time period. The number of nonduplicated household analysis records was approximately 146,000.*

Sources: Multifamily Tenant Characteristics System/Public and Indian Housing Information Center data, 1997–2005; Census 2000 Summary File 3

overall. As shown in exhibit 12, the originating location average poverty rate was 18.3 percent and the portability move location poverty rate was 16.3 percent.

Changes in the Level of Segregation With Portability Moves

In exhibit 16, we show the degree to which a portability move resulted in a move to a more or less segregated metropolitan area. Analysis was not limited to only the 25 metropolitan areas with the highest levels of either racial or income segregation. We included porting households originating in a large metropolitan area (a population of at least 250,000). To compare how each metropolitan area ranked with other metropolitan areas, we used specific measures of segregation for 182 large metropolitan areas. Possible options for portability moves originating in a large metropolitan area included moving to a more segregated MSA, staying in the originating MSA (no change in the level of segregation), moving to a less segregated MSA, moving to a small MSA, or moving to a nonmetropolitan area.

Exhibit 16

Portability Moves by Households Initially Located in a Large Metropolitan Area, 1998–2005, and Measures of Metropolitan Area Racial Segregation and Income Segregation

	1998	1999	2000	2001	2002	2003	2004	2005	1998–2005
Portability moves by measures of racial segregation	(percent)								
Moved to more segregated MSA	14.4	15.7	15.9	16.0	16.0	18.5	18.5	18.4	16.6
Moved in the MSA (same level of segregation)	57.4	56.1	52.7	50.4	51.9	50.8	49.5	45.2	52.2
Moved to less segregated MSA	18.5	18.6	21.7	23.4	22.7	22.3	22.9	25.5	21.8
Moved to small MSA	3.9	3.9	4.2	4.7	4.5	3.7	4.0	4.7	4.1
Moved to nonmetropolitan area	5.8	5.8	5.6	5.6	4.9	4.8	5.2	6.2	5.3
Portability moves by measures of income segregation	(percent)								
Moved to more segregated MSA	14.9	16.6	17.3	17.8	17.3	19.2	19.7	20.2	17.8
Moved in the MSA (same level of segregation)	57.4	56.1	52.7	50.4	51.9	50.8	49.5	45.2	52.2
Moved to less segregated MSA	18.0	17.7	20.3	21.6	21.4	21.6	21.6	23.7	20.6
Moved to small MSA	3.9	3.9	4.2	4.7	4.5	3.7	4.0	4.7	4.1
Moved to nonmetropolitan area	5.8	5.8	5.6	5.6	4.9	4.8	5.2	6.2	5.3

MSA = metropolitan statistical area.

Notes: This exhibit includes only the portability moves by households that were not at admission to the Housing Choice Voucher Program (HCVP). We excluded portability moves at admission to the HCVP because of a lack of information on the preportability location. We completed the analysis using records geocoded with 2000 Census census tracts; preportability location and portability move location needed to be different census tracts. The exhibits in the appendix list information on the measures of segregation used in the analysis. Large metropolitan areas have populations of at least 250,000. Portability moves to areas with the same level of segregation are considered as moves in the same metropolitan area. Data for the 1998–2005 column are based on a nonduplicated count of analysis households during the entire time period. The number of nonduplicated household analysis records was approximately 107,000.

Sources: Multifamily Tenant Characteristics System/Public and Indian Housing Information Center data, 1997–2005; Census 2000 Summary File 3; Housing Patterns data, 2000 Decennial Census

Slightly more than half of the porting households from large metropolitan areas stayed within their MSAs (52.2 percent). When examining either measures of racial segregation or measures of segregation by income, the rates of movement to a more segregated or a less segregated area were very similar. When examining measures of racial segregation (exhibit 16, upper panel), during the study period 16.6 percent of porting households moved to a more segregated metropolitan area and 21.8 percent moved to a less segregated metropolitan area. When examining measures of income segregation (exhibit 16, lower panel), during the study period 17.8 percent of porting households moved to a more segregated metropolitan area and 20.6 percent moved to a less segregated metropolitan area.

Portability Moves in High-Cost and Low-Cost Areas

Exhibit 17 shows information on the portability moves made from higher cost and lower cost jurisdictions. Jurisdiction was based on the reporting housing agency. Jurisdiction cost data analyzed were PHA average monthly per-unit costs, including subsidies and administrative fees, for April 2005 to March 2006 from HUD's Voucher Management System.

The preponderance of portability moves was made from higher cost to lower cost jurisdictions. From 1998 to 2005, an average of 60.7 percent of portability moves were made from higher cost to lower cost jurisdictions. With these portability moves, households were moving to areas where the average subsidy cost was lower, on average, by 11.1 percent. The average monthly subsidy cost was $580 in the preportability location and $505 in the portability move location.

For the 39.3 percent of portability moves from lower cost to higher cost jurisdictions, households were moving to areas where the average subsidy cost was higher, on average, by 35 percent. The average monthly subsidy cost was $478 in the preportability location and $621 in the portability move location.

Considering that most portability moves were from higher cost to lower cost jurisdictions, it appears that portability has resulted in savings of subsidy costs to HUD; however, the percentage of moves from lower cost to higher cost areas increased over time, from 21 percent in 1998 to 44.1 percent in 2005, with a high of 47.8 percent in 2003. Although moves from lower cost to higher cost areas imply higher subsidy costs to HUD, the moves also show that, with portability, households with HCVP assistance are increasingly able to move to higher rent markets.

Determinants of HCVP Portability Moves

In addition to conducting the analyses described earlier, we undertook a multivariate analysis focused on identifying the factors associated with portability moves. We were particularly interested in exploring whether households with certain demographic characteristics—such as race, ethnicity, household composition, sources of income, and length of HCVP stay—statistically are more likely to exercise the portability move option. Multivariate analysis is helpful because it enables us to examine the effect of each characteristic on the likelihood of a portability move, while holding all other factors constant.

Exhibit 17

Portability Moves and Lower and Higher Cost Jurisdictions, 1998–2005
(Based on Average Monthly per-Unit HCVP Subsidy Costs)

	1998	1999	2000	2001	2002	2003	2004	2005	1998–2005
Higher to lower cost jurisdictions									
Percent of all portability moves	79.0	67.5	61.5	59.2	53.6	52.2	52.8	55.9	60.7
Average subsidy cost					(US$)				
Preportability location	536	568	581	590	600	612	614	620	580
Portability move location	496	509	503	495	503	520	519	517	505
Percent change in average subsidy cost with move									
Average	– 5.4	– 8.6	– 11.6	– 14.1	– 14.6	– 13.6	– 14.0	– 15.0	– 11.1
Largest decrease	– 77.1	– 77.3	– 73.9	– 77.0	– 78.1	– 79.5	– 78.7	– 79.6	– 79.6
Lower to higher cost jurisdictions									
Percent of all portability moves	21.0	32.5	38.5	40.8	46.4	47.8	47.2	44.1	39.3
Average subsidy cost					(US$)				
Preportability location	470	465	471	469	479	487	486	493	478
Portability move location	611	625	611	604	623	633	631	622	621
Percent change in average subsidy cost with move									
Average	+ 35.0	+ 39.9	+ 34.9	+ 33.5	+ 34.7	+ 35.2	+ 34.8	+ 30.8	+ 35.0
Largest increase	+ 300	+ 341	+ 421	+ 457	+ 362	+ 425	+ 519	+ 478	+ 519

Notes: This exhibit includes only the portability moves by households that were not at admission to the Housing Choice Voucher Program (HCVP). We excluded portability moves at admission to the HCVP because of a lack of information on the preportability location. Jurisdiction was based on the recording housing agency. PHA average monthly per-unit costs include subsidies and administrative fees. The Lower to higher cost jurisdictions *column includes records in which the percentage of change in the originating and receiving housing agencies' average HCVP subsidy costs was greater than or equal to zero. For those records, data in the* Largest increase *row present the maximum percentage of change (increase) in the average subsidy cost associated with a portability move from a lower to a higher cost jurisdiction. The* Higher to lower cost jurisdictions *column includes records in which the percentage of change in the originating and receiving housing agencies' average HCVP subsidy costs was less than zero. For those records, the* Largest decrease *row presents the maximum percentage of change (decrease) in average subsidy cost associated with a portability move from a higher to a lower cost jurisdiction. Data for the* 1998–2005 *column are based on a nonduplicated count of analysis households during the entire time period. The number of nonduplicated household analysis records was approximately 189,000.*

Sources: Multifamily Tenant Characteristics System/Public and Indian Housing Information Center data, 1997–2005; public housing agency cost per unit data (Voucher Management System, April 2005–March 2006)

The outcome or dependent variable in this analysis is a 0/1 dummy variable indicating whether a household has used the option of a portability move in year *T*. A household's decision to make a portability move was modeled statistically using a logistic regression model with repeated observations for the same set of household units (Wooldridge, 2001). Formally, the model specification is:

$$\log\left(\frac{P_{it}}{1-P_{it}}\right)=\alpha + X_{i1}\beta_1 + X_{i2}\beta_2 + X_{i3}\beta_3 + X_{i4}\beta_4 \quad (1)$$

where

P_{it} represents the probability that household *i* has used the portability move option at year *t*;

α is the constant term;

X_{i1} is a set of flags for the entry year (cohort);

X_{i2} is a vector of household demographic variables;

X_{i3} is a set of geographic covariates;

X_{i4} is a continuous variable measuring the number of years household *i* remains in the program at year *t*; and

β_1, β_2, β_3, and β_4 are vectors of regression coefficients.

The following set of household characteristics and program covariates are included in the model:

- Disability status of household head.
- Elderly status of household head.
- Race/ethnicity of household head.
- Presence of prime-age adults (ages 18–49) in the household.
- Presence of children by age group in the household.
- Total number of household members.
- Whether welfare income accounts for more than half of total household income.
- Whether the household was previously homeless.
- Length of stay in the HCVP (in years) and its squared term.
- Program entry year (cohort).

The set of geographic covariates included dummy variables indicating the census division of a household's location; whether the household was located in the central city, suburb, or nonmetropolitan areas; and the census tract poverty rate (in categories). These variables were intended to measure a household's baseline location (before the portability move, if any).

Unlike ordinary regression models, which include one observation per household (or person), this type of logit model allows for multiple observations for the same household; therefore, the data should be organized in a household-period format. For example, the first observation for household *A* in the data would describe the characteristics of household *A* in the first year of program participation; the second observation would show the characteristics for household *A* in the second year; and so on. Thus, time-varying characteristics, such as household income, household size, and the presence of children, can be incorporated into the model.

Considering the size of the MTCS/PIC database and the type of analysis involved, we conducted the modeling on a 10-percent random sample of the households included in the 1997–2005 data extract. We constructed an analysis file consisting of households that entered the HCVP in 1997 or later. Some of these households may have had spells of housing assistance before 1997 but, at some point, they exited the program and then reentered during the 1997-to-2005 period. To avoid bias in the sample (which would result from truncated household records), we excluded households with ongoing housing assistance that entered before 1997 and never left. This sampling scheme also enabled us to focus on the population of households that entered the program since 1997.[13]

Because coefficient estimates associated with a logit model are difficult to interpret, researchers often convert them into an "odds ratio" format. Statistically, an odds ratio is defined as the probability of the event occurring divided by one minus the probability of the event. In other words, an odds ratio measures the relative likelihood that the effect of a factor will influence the outcome event (portability move, in this case). Variables with an odds ratio estimate of greater than one are interpreted as having a positive effect on the decision a household makes to use the portability move option, while variables with an odds ratio estimate of less than one suggest that the presence of these variables decreases the likelihood of portability moves.

Exhibit 18 lists the logit model's odds ratio estimates of a portability move. Most of the estimates are statistically significant and have the expected sign/direction. The following summary of observations is based on the model:

- No evidence indicates that a head of household with disabilities will use the portability move differently than other households would.
- Compared with other households, households headed by elderly people are less likely (odds of 0.55 times which is statistically significant) to exercise the portability move option, everything else being equal.
- Compared with other households, households headed by non-Hispanic African Americans are more likely (odds of 1.3 times) to use the portability move option.
- The presence of prime-age adults (ages 18 to 49) in a household is associated with a slightly higher likelihood of a portability move (odds of 1.086 times), holding all other factors constant.
- Households with preschool-aged children (ages 0 to 5) are more likely (odds of 1.4 times) to exercise portability than households with similar demographic and location characteristics. The presence of children in older age groups has no effect on the probability of portability moves.
- A household that has welfare income accounting for more than half of its income has a higher likelihood (1 percent, which is statistically significant) of making a portability move than other household types do.

[13] Portability moves were determined and analyzed for the period of 1998 to 2005. Household data from 1997 were included to help determine if a 1998 action was a portability move.

Exhibit 18

Coefficient Estimates From the Logistic Model of a Portability Move

	Odds Ratio
Household characteristics	
Household head is disabled	1.006
	(0.037)
Household head is elderly	0.550 ***
	(0.037)
Household head is non-Hispanic White	Reference
Household head is non-Hispanic African American	1.349 ***
	(0.044)
Household head is Hispanic	1.050
	(0.047)
Household head is other races/ethnicities	0.861 *
	(0.076)
Presence of prime-age adults (ages 18–49)	1.086 *
	(0.052)
Presence of preschool-aged children (ages 0–5)	1.440 ***
	(0.052)
Presence of young children (ages 6–12)	1.000
	(0.035)
Presence of teenagers (ages 13–17)	0.916 **
	(0.036)
Number of persons in household	0.993
	(0.014)
Welfare income accounted for more than half of total household income	1.366 ***
	(0.047)
Previously homeless	0.927
	(0.088)
Program characteristics	
Length of HCVP stay (in years)	3.131 ***
	(0.118)
Length of HCVP stay squared	0.860 ***
	(0.005)
1997 entering cohort	Reference
1998 entering cohort	0.552
	(0.243)
1999 entering cohort	0.442 *
	(0.195)
2000 entering cohort	0.330 **
	(0.145)
2001 entering cohort	0.299 ***
	(0.131)
2002 entering cohort	0.262 ***
	(0.115)
2003 entering cohort	0.242 ***
	(0.107)

Exhibit 18

Coefficient Estimates From the Logistic Model of a Portability Move (continued)

	Odds Ratio
2004 entering cohort	0.144 ***
	(0.064)
2005 entering cohort	0.283 **
	(0.164)
Household location (before move)	
Central city	Reference
Suburb	1.406 ***
	(0.044)
Nonmetropolitan	1.271 ***
	(0.049)
Neighborhood poverty rate less than 10 percent	1.061 *
	(0.036)
Neighborhood poverty rate 10–20 percent	Reference
Neighborhood poverty rate 21–30 percent	0.939 *
	(0.034)
Neighborhood poverty rate greater than 30 percent	0.881 ***
	(0.036)
New England census division	1.575
	(0.452)
Middle Atlantic census division	0.994
	(0.284)
East North Central census division	0.870
	(0.249)
West North Central census division	1.314
	(0.377)
South Atlantic census division	1.091
	(0.312)
East South Central census division	0.794
	(0.230)
West South Central census division	0.997
	(0.285)
Mountain census division	1.482
	(0.426)
Pacific census division	1.336
	(0.381)
Puerto Rico and other outlying territories	Reference
Log likelihood = – 29,700 Number of households = 96,560 Number of household-year observations = 321,163	

Notes: Dependent variable = 1 if household i exercised portability move at year j.
= 0 otherwise.

Standard errors are in parentheses.

** Significant at 10 percent; ** significant at 5 percent; *** significant at 1 percent.*

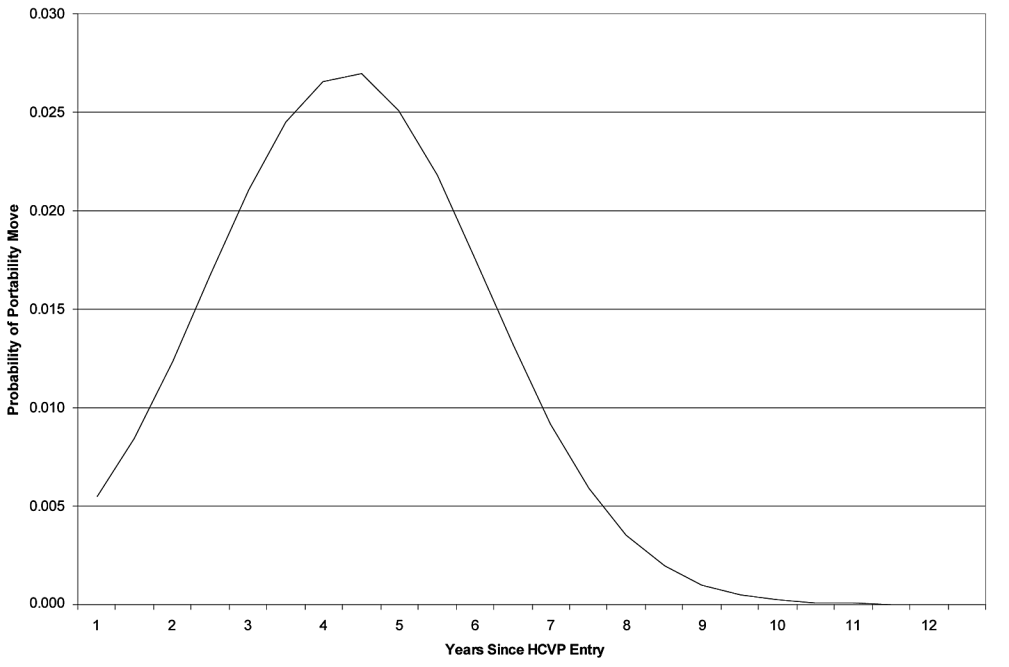
Sources: Multifamily Tenant Characteristics System/Public and Indian Housing Information Center data 1997–2005; Census 2000 Summary File 3

- The length of stay in the HCVP correlates with a household's portability move decision. Exhibit 19 shows the relationship between the duration of program stay (in years) and the probability of portability move, using coefficient estimates from the logit model.[14] For an average HCVP participant, the likelihood of making a portability move increases monotonically from program entry and peaks between the fourth and fifth years. Starting in the fifth year, the probability of a portability move begins to decrease.
- Households that entered the HCVP in recent years tend to be less likely to exercise the portability move option than households from the earlier cohorts.
- Compared with households in central cities, households in suburbs and nonmetropolitan areas have a higher likelihood of making a portability move, all else being equal.
- Households in low-poverty areas (defined as census tract poverty rate below 10 percent) have slightly higher odds of portability; households in high-poverty neighborhoods (census tract poverty rate greater than 20 percent) are less likely to exercise portability. The reference category in this analysis is households in neighborhoods with poverty rates between 10 and 20 percent.

The multivariate analysis thus bears out the relationships observed in many of the earlier tables.

Exhibit 19

Relationship Between the Length of HCVP Stay and Probability of a Portability Move



HCVP = Housing Choice Voucher Program.

[14] To compute the predicted probability, we varied the value of the Housing Choice Voucher Program stay variables (from 0 to 12 by an increment of 0.5) and set the other variables in the mode to the sample mean values.

Conclusion

Through portability, participants in the Housing Choice Voucher Program have the option of using a voucher to move to a unit outside the issuing housing agency's jurisdiction. In this article, we discussed the findings of an analysis of portability moves made from 1998 to 2005. Using a specially constructed longitudinal data set developed from U.S. Housing and Urban Development administrative records, we first identified records that represented portability moves, and then we analyzed household and neighborhood characteristics associated with portability moves. Of the 3.4 million households that received housing assistance in the voucher program during these years, 8.9 percent made a portability move.

Portability movers were less likely to have a White head of household (51.4 percent) compared with households in the overall HCVP (56.6 percent), and they were more likely to have an African-American head of household (45.6 percent) than households in the overall HCVP (39.8 percent). Portability mover households on average were younger than households in the overall HCVP (39.5 years old compared with 43 years old, respectively). Portability movers were more likely to be households with children, and households with preschool-aged children were 1.4 times more likely to complete a portability move compared with other households in the HCVP with similar demographic and location characteristics. When examining annual income sources, porting households were less likely to have wage income and slightly more likely to have welfare income. Households with welfare income accounting for at least half of household income had a higher likelihood of completing a portability move compared with other households. Length of stay in the HCVP also correlated with portability moves—portability moves were most likely to occur between the fourth and fifth years of HCVP participation.

Portability movers typically moved to census tracts with lower poverty rates and lower minority rates. In the preportability location, the average census tract poverty rate was 18.3 percent, and in the portability move location, the average census tract poverty rate was 16.3 percent. Overall, average census tract minority rates decreased from 45.9 percent in the preportability location to 43.8 percent in the portability move location. Statistics for portability households originating in a metropolitan area highly segregated by race show the average census tract minority rate was 63.3 percent in the preportability location and 51.0 percent in the portability move location.

The HCVP operates primarily in metropolitan areas, and portability movers were most likely to move to a metropolitan area. The highest portion of portability moves was within the same metropolitan area (41.3 percent), the next highest portion of portability moves was from one metropolitan area to another metropolitan area (37.3 percent), and another 10.2 percent moved from a nonmetropolitan area to a metropolitan area. Nearly one-third of portability moves were moves of more than 100 miles, and the median portability move was 25 miles. The analysis of public housing jurisdictions by program costs indicated that three-fifths of portability moves were made to lower cost jurisdictions compared with the originating jurisdiction.

Appendix

Highly Segregated Metropolitan Areas, 2000

Exhibit A–1

The 25 Most Racially Segregated Metropolitan Areas, With a Population of 250,000 or More, in 2000

MSA/PMSA Name	MSA/PMSA Code	Total Population	Dissimilarity Index
Detroit, MI PMSA	2160	4,441,551	0.846
Gary, IN PMSA	2960	631,362	0.839
Milwaukee-Waukesha, WI PMSA	5080	1,500,741	0.818
New York, NY PMSA	5600	9,314,235	0.810
Newark, NJ PMSA	5640	2,032,989	0.801
Chicago, IL PMSA	1600	8,272,768	0.797
Cleveland-Lorain-Elyria, OH PMSA	1680	2,250,871	0.768
Buffalo-Niagara Falls, NY MSA	1280	1,170,111	0.766
Flint, MI PMSA	2640	436,141	0.765
Cincinnati, OH-KY-IN PMSA	1640	1,646,395	0.739
Bridgeport, CT PMSA	1160	459,479	0.737
Saginaw-Bay City-Midland, MI MSA	6960	403,070	0.732
St. Louis, MO-IL MSA	7040	2,603,607	0.731
Nassau-Suffolk, NY PMSA	5380	2,753,913	0.730
Bergen-Passaic, NJ PMSA	0875	1,373,167	0.723
Philadelphia, PA-NJ PMSA	6160	5,100,931	0.720
Youngstown-Warren, OH MSA	9320	594,746	0.719
Fort Wayne, IN MSA	2760	502,141	0.706
Indianapolis, IN MSA	3480	1,607,486	0.704
Birmingham, AL MSA	1000	921,106	0.701
Harrisburg-Lebanon-Carlisle, PA MSA	3240	629,401	0.699
Peoria-Pekin, IL MSA	6120	347,387	0.699
Dayton-Springfield, OH MSA	2000	950,558	0.698
Beaumont-Port Arthur, TX MSA	0840	385,090	0.694
Miami, FL PMSA	5000	2,253,362	0.694

MSA = metropolitan statistical area. PMSA = primary metropolitan statistical area.

[a] This exhibit lists the 25 metropolitan areas, each with a population of 250,000 or more, with the highest levels of racial segregation based on the following data components:

Year: 2000 Census.

Racial minority: African Americans.

Measure of segregation: dissimilarity index.

Unit of analysis for computing the dissimilarity index: census tract.

Note: The metropolitan areas are MSAs/PMSAs based on the Office of Management and Budget definitions for metropolitan areas as of June 30, 1999.

Source: U.S. Census Bureau (http://www.census.gov/hhes/www/housing/housing_patterns/excel_msa.html)

Exhibit A–2

The 25 Metropolitan Areas Most Segregated by Income, With a Population of 250,000 or More, in 2000

MSA/PMSA Name	MSA/PMSA Code	Total Population	Dissimilarity Index
New York, NY PMSA	5600	9,314,235	0.787
Milwaukee-Waukesha, WI PMSA	5080	1,500,741	0.778
Newark, NJ PMSA	5640	2,032,989	0.773
Philadelphia, PA-NJ PMSA	6160	5,100,931	0.769
Birmingham, AL MSA	1000	921,106	0.758
Toledo, OH MSA	8400	618,203	0.758
Louisville, KY-IN MSA	4520	1,025,598	0.750
Cleveland-Lorain-Elyria, OH PMSA	1680	2,250,871	0.749
Bridgeport, CT PMSA	1160	459,479	0.742
Memphis, TN-AR-MS MSA	4920	1,135,614	0.742
Los Angeles-Long Beach, CA PMSA	4480	9,519,338	0.739
Dallas, TX PMSA	1920	3,519,176	0.737
Detroit, MI PMSA	2160	4,441,551	0.736
Trenton, NJ PMSA	8480	350,761	0.735
Columbus, OH MSA	1840	1,540,157	0.731
Chicago, IL PMSA	1600	8,272,768	0.728
Tucson, AZ MSA	8520	843,746	0.726
Denver, CO PMSA	2080	2,109,282	0.725
Omaha, NE-IA MSA	5920	716,998	0.725
Houston, TX PMSA	3360	4,177,646	0.724
Akron, OH PMSA	0080	694,960	0.722
Phoenix-Mesa, AZ MSA	6200	3,251,876	0.722
Baltimore, MD PMSA	0720	2,552,994	0.719
St. Louis, MO-IL MSA	7040	2,603,607	0.717
San Antonio, TX MSA	7240	1,592,383	0.717

MSA = metropolitan statistical area. PMSA = primary metropolitan statistical area.

[a] This exhibit lists the 25 metropolitan areas, each with a population of 250,000 or more, with the highest levels of income segregation based on the following data components:

Year: 2000 Census.

Low income: estimated number of families with an annual income of less than 30 percent of MSA/PMSA median.

High income: number of families with an annual income of more than $200,000.

Measure of segregation: dissimilarity index.

Unit of analysis for computing the dissimilarity index: census tract.

Note: The metropolitan areas are MSA/PMSAs based on the Office of Management and Budget definitions for metropolitan areas as of June 30, 1999.

Sources: Census 2000 Summary File 3, Tables P76 and P77

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The Role of Social Networks in Making Housing Choices: The Experience of the Gautreaux Two Residential Mobility Program

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Abstract

This article explores the experiences of participants in the Gautreaux Two housing mobility program, which was implemented in 2002. The program gave low-income residents of Chicago public housing a special voucher providing them the opportunity to move to more advantaged neighborhoods, designated as neighborhoods in which at least 76.5 percent of households were nonpoor and 70 percent were non-African American. Four waves of indepth, qualitative interviews were conducted by Northwestern University's Institute for Policy Research (IPR) between 2002 and 2005 with a randomly chosen sample of 91 families. Within the 3-year study window, this qualitative analysis of the IPR data compares residents who made secondary moves with those who stayed at their Gautreaux placement addresses. In this article, I apply insight from feminist urbanism and a focus on social networks to a comparison of the reasons some residents moved while others stayed. Secondary movers were motivated by several social network factors, including feelings of social isolation in the placement neighborhood, distance from kin, and transportation difficulties. Conversely, strong social networks were crucial reasons why some families remained in their Gautreaux neighborhoods or moved on to other similarly advantaged neighborhoods. This analysis explores policy implications for the success of mobility programs, including the need for continued program assistance to build and maintain strong social networks beyond the initial placement.

Introduction

During the past three decades, housing mobility programs, such as the Chicago Housing Authority's (CHA's) Gautreaux program and the federal Moving to Opportunity program, provided low-income families with a unique opportunity to relocate from some of the poorest, most segregated, and crime-ridden neighborhoods in the nation—large inner-city housing projects—to safer and more prosperous neighborhoods.[1] Previous research has shown that over time not all families who move through these programs remain in these more advantaged neighborhoods. The benefit of such a move presumably depends on the length of exposure to more advantaged neighborhoods (Clark, 1991).[2]

The results of the original Gautreaux program, which was implemented in 1976, have been largely favorable. Indications are that the program had a long-term effect on the residential locations of participants and has improved employment and health outcomes for participants and their families (Keels, Forthcoming a, b; Keels et al., 2005; Mendenhall, DeLuca, and Duncan, 2006; Rosenbaum and DeLuca, 2000; Rosenbaum, DeLuca, and Tuck, 2005; Rubinowitz and Rosenbaum, 2001). The transition from public housing to more prosperous city neighborhoods or the suburbs is not a smooth and straightforward one; it is rather complicated and nuanced. This article provides an analysis exploring the nuances of this transition in the second Gautreaux program.

As with its predecessor, the Gautreaux Two program gave low-income residents of Chicago public housing, located in areas with very high rates of economic and racial segregation, the opportunity to move to racially diverse and more affluent neighborhoods.

In October 2001, CHA sent letters inviting all tenants to participate in the program. A total of 549 families attended orientation sessions, and those who completed the required followup activities received a voucher from the federal Housing Choice Voucher Program (HCVP) for low-income families. Unlike other vouchers, however, these vouchers had a set of special requirements: they could be used only for units in census tracts with no more than 23.49 percent of residents living in poverty and no more than 30 percent of residents being African American.[3] Such neighborhoods were designated "opportunity areas." After residing in these opportunity areas for 1 year, the families could either remain in their units or use their vouchers to move—without the poverty and race restrictions—to any neighborhood they chose.

[1] Although most lived in large housing projects, a few families came from scattered-site public housing, which was typically located in neighborhoods with lower poverty and less segregation.

[2] Researchers find various benefits of moving from segregated, high-poverty areas to more diverse and wealthier neighborhoods. Research on the original Gautreaux program found that these benefits included educational, employment, and health benefits (see Rosenbaum and DeLuca, 2000; Rosenbaum, DeLuca, and Tuck, 2005; Rubinowitz and Rosenbaum, 2001).

[3] Gautreaux and Gautreaux Two both were court-ordered remedies for a racial discrimination suit brought by public housing residents (including Dorothy Gautreaux) against the Chicago Housing Authority. Thus, unlike the Moving to Opportunity program, the Gautreaux programs have racial as well as economic restrictions on the neighborhoods where residents can use their vouchers.

The experiences of participants in the Gautreaux Two program relate to the HCVP more generally. The HCVP is the U.S. Department of Housing and Urban Development's (HUD's) largest housing subsidy program; it is implemented in every metropolitan area throughout the country. As Devine et al. (2003: vii) explain in their report on HCVP location patterns, the program allows participants to secure housing in the private rental market and "encourages participants to avoid high-poverty neighborhoods." Administrative data on the HCVP show that a low percentage of voucher recipients continue to move to more advantaged neighborhoods (see Devine et al., 2003; Feins and Patterson, 2005). Understanding the experiences of the Gautreaux Two program participants provides insight into these location patterns by exploring how voucher holders make housing choices.

A previous analysis of the Gautreaux Two program by Pashup et al. (2005) examined the process by which families participating in the program moved through the program and the difficulties they faced in trying to relocate to a new neighborhood. The study established that some participants found it difficult to move through the Gautreaux program because of both external and internal obstacles. External obstacles included a tight rental market, landlord discrimination against housing vouchers, and bureaucratic delays. Internal obstacles included a poor understanding of program requirements, large household size, and mental or physical health problems.

Another analysis of Gautreaux Two by Reed, Pashup, and Snell (2005) assessed the ways the program affected participation of female movers in the labor force. The study found several primary obstacles to working, including childcare responsibilities, illness and health issues, transportation difficulties, and layoffs from temporary jobs. This analysis also found that moving had little effect on the employment situation of most study participants.

A third analysis of the Gautreaux Two program (see Boyd et al., 2007) provides an overview of the various influences on respondents' decisions to move. Hassles with landlords and poor-quality units were primary factors, along with social network-related factors.

This article uses indepth qualitative interviews with program participants to assess the ways that social networks influence families' decisions about remaining in their Gautreaux neighborhoods or moving on to other neighborhoods. The analysis focuses on family experiences in the first months and years of adjusting to a new neighborhood, because those experiences may prove vital to understanding the factors underlying the frequency of secondary moves and the variation in subsequent neighborhood quality, focusing primarily on factors related to social networks. This analysis addresses the following questions: What social network factors prompt families to make secondary moves within 3 years after placement? What social network factors determine the kind of neighborhoods secondary movers choose?

Literature Review

To understand the context of the experiences of the Gautreaux Two participants, it is important to consider the ways in which residential segregation influences neighborhoods and to understand how social networks intersect with neighborhood life.

Racial Residential Segregation and Neighborhood Effects

The original Gautreaux program was implemented in 1976 after a lawsuit argued that HUD and the CHA were discriminating on the basis of race by engaging in "systematic and illegal segregation" (Keels et al., 2005: 53). Racial segregation is the primary residential pattern in cities in the United States, and this pattern is not simply the result of historical processes. Racial segregation continues because of ongoing individual and institutional discrimination (Bobo and Zubrinsky, 1996; Massey and Denton, 1993). African Americans are less likely than Whites to be able to move out of low-income areas, more likely than Whites to move into low-income areas, and less capable of relocating to suburbs, even when socioeconomic status is taken into account (Crowder, 2001; Logan, Alba, and Leung, 1996; South and Crowder, 1997). Thus, African Americans' decisions about residential location are determined largely by external forces rather than simply by personal preferences (Crowder, 2001; Massey, Condran, and Denton, 1987).

Researchers point to the negative effect that living in areas of concentrated poverty and high crime rates may have on individual outcomes, including health, education, employment opportunities, safety, and mortality (Allard and Danzinger, 2003; Brooks-Gunn et al., 1997; Crane, 1991; Mayer and Jencks, 1989; Peterson and Krivo, 1993). Neighborhoods are so-called "opportunity structures" consisting of systems, networks, and institutions (Galster and Killen, 1995: 15) that vary in their ability to provide opportunity for upward mobility. Segregated ghettos have attenuated opportunity structures, particularly for employment (Wilson, 1996, 1987).

Positive effects are presumed to follow movement to more affluent neighborhoods with greater racial diversity. Although previous research does not consistently find benefits of living in affluent neighborhoods, some recent evidence indicates that neighborhoods can confer both advantages and disadvantages to residents, particularly children (Newman and Schnare, 1997). Children's neighborhoods are related to their cognitive development, and children living in affluent areas are surrounded by greater resources and more enrichment opportunities (Brooks-Gunn et al., 1997). The outcomes for parents and children may be related to the quality and availability of services in their neighborhoods, or of jobs, because living closer to job opportunities is associated with a higher probability of working (Allard and Danzinger, 2003; Ellen and Turner, 1997).

This recognition of the advantages and disadvantages associated with neighborhoods relates to the goals of the HCVP, which assists 1.9 million households throughout the United States. As Devine et al. (2003: vii) state, "Because the [HCVP] program encourages participants to avoid high-poverty neighborhoods, and encourages the recruitment of landlords with rental properties in lower-poverty neighborhoods, it has the potential to affect both the welfare of participants and the welfare of the neighborhoods where they live." The potential to improve the welfare of participants, however, depends largely on continued residence in more advantaged neighborhoods. Using longitudinal data from HUD administrative records, Feins and Patterson (2005: 21) find that after entering the program, "a small but consistent tendency exists for families making later moves to choose slightly better neighborhoods." Thus, it is important to understand why only a small percentage of families make moves to more advantaged neighborhoods through the HCVP. Although the vouchers that the Gautreaux Two participants received had special requirements, housing decisions the participants made provide insight into factors affecting how families use the HCVP in metropolitan areas more generally.

Social Networks

Housing mobility programs and related policies assume that individuals and families who live in segregated urban areas are more disadvantaged than households living in more resource-rich areas and that moving to safer and wealthier neighborhoods will result in a better quality of life and increased life chances. Among the mechanisms that transmit neighborhood-level characteristics to individual outcomes, social networks are primary because they offer access to social capital and opportunities (Briggs, 1997; Ellen and Turner, 1997; Mendenhall, 2005). Portes (1998: 6) defines social capital as the "ability of actors to secure benefits by virtue of membership in social networks or other social structures." The focus on development and maintenance of social networks is significant for housing mobility program research (Briggs, 1997; Clampet-Lundquist, 2004; Mendenhall, 2005).

Briggs (1997) critiques the housing program assumption that moving to more advantaged neighborhoods results in various personal benefits and reminds researchers and policymakers that moving low-income families into affluent neighborhoods does not automatically result in positive effects for these families, because there are challenges with creating connections in the new neighborhoods and with benefiting from the resources of those neighborhoods. Clampet-Lundquist (2004) shows that, although policymakers assume that children and adults who move through mobility programs will create the kind of social ties in their new neighborhoods that will enable them to become more economically independent, this assumption does not always materialize because forming ties is not easy and these ties take time to develop.

Because people in racially segregated areas with high levels of poverty tend to use local social ties and make ties with others who are very similar to themselves (Briggs, 1997; Clampet-Lundquist, 2004; Gilbert, 1998), one goal of mobility programs is to relocate such families to areas where they can form more diverse social ties with people who differ from them in resources and networks. Presumably, these ties should lead to more diverse information sources and access to new opportunities (Granovetter, 1973). Clampet-Lundquist (2004) suggests that families from high-poverty, racially segregated areas may lack the resources to use the newly available ties in a way that improves their situation (see also Kleit, 2001).

Barriers of race, class, and gender can inhibit the creation of diverse networks (Kissane and Clampet-Lundquist, 2005; Mendenhall, 2005). For example, in her analysis of the original Gautreaux program, Mendenhall (2005) found that, for the women who participated in the program, the development of networks and social capital was negatively influenced by the social distance created by race, class, and gender differences between the women and their neighbors. These barriers can serve as types of negative (or exclusionary) social capital because the social relations that contribute to a sense of support and cooperation among community members can also lead to the exclusion of outsiders (Portes, 1998; Waldinger, 1995). Allport's contact theory argues that prejudice "may be reduced by equal status contact between majority and minority groups in the pursuit of common goals" (1954: 281). This concept of equal status contact is important, because families who moved through Gautreaux Two had to move to neighborhoods with different racial and class compositions than their original neighborhoods and because they did not have equal status in race and class with many of their new neighbors. Thus, low-income, African-American families face both race and class barriers when moving to predominantly

wealthy, White neighborhoods (Kissane and Clampet-Lundquist, 2005). These barriers are exacerbated by gender, because low-income, African-American single mothers often face social stigma and gender discrimination (Mendenhall, 2005).

Feminist Urbanism

Although little previous literature on housing mobility programs includes feminist urbanism theory, it is a useful perspective that provides ways of conceptualizing the importance of social networks for the women who participated in the Gautreaux program in ways that much of the literature on neighborhood effects overlooks. The literature on racial residential segregation and neighborhood effects does not always consider gender in its picture of neighborhoods and the differential effects of neighborhoods on family and individual outcomes. On the other hand, a feminist urbanism perspective provides ways to consider the nuances of neighborhoods and social networks by drawing attention to the unique experiences of women in urban spaces (Deutsch, 2000; Domosh, 1998; England, 1996; Hayden, 1981; Jacobs, 1961; McDowell, 1993; Wyly, 1999).

Feminist urbanism is particularly relevant in analyzing housing mobility programs, because most families who are affected by these policies and programs are households headed by females. Single mothers and their children are the poorest demographic group in the United States (Edin and Lein, 1997), and it is crucial to recognize that different inequalities intersect to shape the lives of women (Collins, 1990; Gilbert, 1997). This concept is especially true when seeking to understand the stories of the participants in the Gautreaux program, because all but one are female, all are low income, and nearly all are African American. Specifically, family responsibilities, transportation, and social networks are central issues to consider from a feminist urbanism perspective, because these issues largely shaped the experiences of the women in their placement neighborhoods.

A primary family responsibility is childcare, and childcare is often a salient issue for women, particularly women who are working. Childcare access is place based, and employed mothers of young children often have trouble finding affordable, good-quality childcare in their neighborhoods. This circumstance leads many mothers to develop informal solutions to childcare, pointing out an important way that social networks serve to ameliorate some of the difficulties that single, working mothers face (Dyck, 1996). Another family responsibility is elder care. Women are typically the primary caregivers for elderly parents or ill family members, which results in more time constraints, especially for employed women (Spain, 2002). Complicating these issues is the fact that women often are limited by poor public transportation, adding difficulties in various areas of their lives (England, 1996; Shlay and DiGregorio, 1985).

Women's social networks are typically kin and neighbor oriented, and women with families often want to live near their friends, family, and relatives (Gilbert, 1998; Shlay and DiGregorio, 1985; Stack, 1974). Race intersects with class and gender to shape women's "spatial rootedness"—their social networks and survival strategies (Gilbert, 1998: 595). The personal networks of African-American and White women are different, and African-American women living in low-income, inner-city areas have the most intensive local ties, and they are not spatially diverse (Gilbert, 1998). Church and family networks are especially central in the lives of many African Americans because both of these institutions historically have helped relieve the pressures of living in a racist society (Gilbert, 1998).

Social networks, specifically kin networks, are crucial in low-income, African-American communities, particularly for women and especially for childcare (Edin and Lein, 1997; Stack, 1974). Among women who have low levels of education, those who live in high-poverty areas use informal contacts, such as family, friends, and neighbors, more than women living in low-poverty areas do (Elliott, 1999). In her analysis of the participants in the first Gautreaux program, Mendenhall (2005: 85) found that social networks were one of the primary "culturally influenced adaptive responses" that the women made to the challenges they faced. When the participants in the Gautreaux Two program moved away from their baseline communities, this process of creating new social ties and changing networks became an important part of their story.

Data and Methods

This analysis is based on data collected by a research team headed by Kathryn Edin, Greg Duncan, and James Rosenbaum at Northwestern University's Institute for Policy Research. These researchers observed all of the Gautreaux Two program orientation sessions and conducted qualitative, indepth, semistructured interviews between 2002 and 2005 with 91 of the 549 clients who attended the Gautreaux Two orientation sessions. Researchers initially randomly sampled 20 percent of all clients, 71 of whom agreed to participate in the study; however, because of the unexpectedly low number of participants who moved through the Gautreaux program,[4] a second sample of families who seemed to be likely movers was drawn, adding 20 more families to the study.

Researchers conducted four waves of indepth, focused interviews with respondents in their homes over a 3-year period. The interviews were semistructured, open-ended interviews that lasted between 2 and 4 hours. The initial interviews occurred within 3 months of the participants' orientation session, and the subsequent interviews took place approximately 6 to 9 months after the previous interview. Thus, most respondents were interviewed four times between 2002 and 2005. Some respondents were interviewed less than four times if they were not found at some point during the 3-year period. The indepth interviews covered various topics related to program participation, and topics were adjusted after each wave to reflect the new subjects that emerged throughout the previous interviews.

Almost all the respondents were African American. The remaining few were Caribbean or Puerto Rican, and all but one of the respondents were female heads of households. The average age of adult respondents at baseline was 32 years, and the average household size was four members. Respondents lived in their current housing development for an average of 8 1/2 years at the time of the study.

I analyzed the transcripts of the interviews with all of the respondents in the sample who moved through the Gautreaux program. To gain a broad understanding of the reasons why respondents stayed in or moved from their placement neighborhoods, I read several waves of interviews for each of the respondents and coded the interviews for patterns that addressed the research questions.

[4] See Pashup et al. (2005) for a detailed analysis of the factors that made making an initial move through the Gautreaux Two program difficult.

I then constructed a profile of the experiences of each respondent in the new neighborhood and the reasons for either staying or leaving in relation to social networks. After creating these profiles, I counted the cases for each category that emerged from the coding and created a narrative analysis of reasons for moving and staying. I also used the extensive field notes that the interviewers took after each interview to get a better picture of each respondent, his or her unit, and his or her neighborhood.

I specifically examined those respondents who moved through the Gautreaux program and divide them into two categories—those who stayed in their placement neighborhoods ("stayers") and those who made a subsequent move from their placement neighborhoods ("secondary movers"). I also focused on the types of neighborhoods to which the secondary movers moved and classified them as either opportunity areas or nonopportunity areas based on the original Gautreaux program requirements for what constitutes an opportunity area.

Results

Of the 58 respondents in our sample who moved through the Gautreaux Two program by 2005, 27 (47 percent) were stayers and 31 (53 percent) made secondary moves. Only 19 percent of secondary movers moved on to opportunity areas, while the remaining 81 percent moved to nonopportunity areas, as defined by the Gautreaux Two program's race and poverty requirements. I divide the analysis into two sections: the first assesses the social network factors that influenced why secondary movers made subsequent moves, and the second examines the social network factors that contributed to stayer respondents' decisions to remain in their Gautreaux units.

Secondary Movers

Although most secondary movers moved to nonopportunity areas, the families who moved to another opportunity area provide insight into the importance of social networks as well. Of the six families that made a secondary move to another opportunity area, three of those families moved to other opportunity areas where they had family living, which demonstrates the importance of family networks in respondents' decisions about where to move. The other three respondents who made secondary moves to opportunity areas all moved because they had problems with their Gautreaux units and landlords but otherwise would have stayed in their placement neighborhood. Half of the families who moved to another opportunity area made decisions primarily based on proximity to kin networks, as did many of the movers to nonopportunity areas. The difference for the secondary movers to opportunity areas is that they had kin networks based in more affluent and diverse neighborhoods, while many of the movers who returned to nonopportunity areas did not. It is important to analyze what aspects of social networks affect families' decisions to make a secondary move to more disadvantaged neighborhoods.

Social Isolation

Many respondents who moved through the program initially relocated to areas where they did not have any family or friends and, for many, transportation issues made it difficult to visit these kin networks. This lack of kin and transportation resulted not only in a sense of social isolation

for respondents, but it also removed them from their primary support networks, particularly for childcare. Some respondents also had ill family members for whom they cared. Living far away made it difficult for them to fulfill their care responsibilities. For example, Latisha's[5] placement neighborhood was in the suburbs, and the distance from her family made it difficult for her to fulfill her familial responsibilities. She was the primary caregiver for her diabetic mother, and her main reason for moving back to Chicago was to care for her. When asked why she moved back, Latisha said:

> *"Well for one reason, my mom. She had got sick, and this was one of the reasons why I moved back to Chicago, so I could kinda help my mom out, you know. And I just started lookin,' cause she had got real sick real bad. She's a diabetic and she's partially blind and she had like four mini strokes. And then she had, her hemoglobin was low. You know? It was, it was like she was goin'—you know, she was gettin' down. She, you know, just everything was outta control. So by me runnin' back and forth on the train, back and forth, you know—[it was hard]."*

Latisha was socially isolated in her placement neighborhood; her family did not visit her often because of the distance, and, after making her secondary move, Latisha was better able to care for her mother. The distance made her fulfillment of familial responsibilities untenable, leading her to become a secondary mover back to a nonopportunity area.

To some extent, all the respondents who discussed distance from kin as a problem were socially isolated; however, many respondents were not only far from their family and friend networks, they also did not immediately connect with their neighbors and were not involved in neighborhood activities. Some said they just lived in their unit and went elsewhere to socialize; therefore, they did not fully engage with the neighborhood or develop neighborhood networks. Other respondents did not feel completely accepted in their new neighborhoods, which made it difficult for them to form friendships. Some respondents saw their Gautreaux neighborhoods as transitional and were just biding their time until they could move again. For these respondents, the ultimate goal was getting a voucher that would enable them to move wherever they wanted. The demand for Housing Choice Vouchers has always outstripped their supply, so some families were willing to move for a year to an opportunity area so they could subsequently move on to where they wanted to live.

Talia, for example, considered her placement neighborhood to be too far from her family and saw her Gautreaux move as temporary:

> *"I'm so used to the South Side. I've been there all my life. This is something new to me. I don't want to get to know this place. Nope, because I'm ready to move. So I ain't trying to get to know this place."*

When asked where she wanted to move, Talia responded:

> *"South Side, like Southwest. Like over there where my mama lives."*

[5] All respondents' names are pseudonyms.

Talia made a secondary move back to a neighborhood near the area where, before their demolition, the Robert Taylor Homes stood. Robert Taylor Homes, a public housing project located in one of the city's poorest and most racially segregated neighborhoods, was where she grew up.

Tara continued to work and take classes on the South Side of Chicago after her Gautreaux move to the North Side, just as she had before the move. Thus, she spent a lot of time commuting and, not surprisingly, found the location of her Gautreaux apartment to be very inconvenient. No neighborhoods near her school or job had qualified as opportunity areas. The familiarity and ease of her routine of working, going to school, and shopping that she had developed on the South Side before her move is why she maintained ties with her baseline neighborhood on the South Side and did not even try to become familiar with her North Side Gautreaux neighborhood:

> *"When I go to the show, even though there's a show right here, I'll go to the show on the South Side. When I go out to eat, I go out to eat on the South Side. So, there's no type of activity or anything going…. I'm not even FAMILIAR with this North Side. All I can do is get to my house, and back out to where I need to go. I'm not familiar; I couldn't tell you how to get to a store around here."*

Not surprisingly, Tara ended up making a secondary move to the South Side of Chicago to a nonopportunity area to be closer to her family and job.

One primary thing respondents missed about their baseline neighborhoods was the regular social interactions they had with their neighbors in the housing projects. Francine said:

> *"Actually, like I said, since I been here, I don't feel I been happy, because this place depresses me, because there's nothin' to do, nothin', you know? [I] can't get out much because the buses stop runnin' early. I don't have a car. I don't know how to drive. So that's another bad thing, you know? So I don't get out."*

When asked what she missed about public housing, Francine said:

> *"Just bein' able to go outside, sit down and talk. Because in the projects you can sit down and talk to everybody. Someone's always walkin' around. Here you sit on your porch and that's it, you know? It's always somethin' goin' on in the project, there's never nothin' goin' on here. So, yeah I do miss that, but the projects itself, no, I don't miss [the projects]. Since I been here [my health] seems to me it's been worser, yeah, because I guess, I don't know. It was like when I was livin', you know, down there in the projects, I got out more and did more, you know? So it helped my strength, whatever. Now here it's just like blah, you know? I don't do nothin', it seem like I depressin' myself, makin' myself sick."*

Tina also explained how difficult it is to be removed from a neighborhood where neighbors know you and are willing to provide support. When asked what she missed about her baseline neighborhood, Tina said:

> *"Well, the people, because I know a lot of people. Like all over the neighborhood. I know a lot people. Where, it's not like here. OK, if I get stuck I can't hit no one [up for help]. You know what I'm saying? Over there everybody knows me. [If] I need [something] or I don't have any money and I need a ride to the emergency [room]; there's always somebody because they all know me."*

Felicia echoed these sentiments of missing her support network in her old neighborhood:

> *"[I miss] being able to just walk out and talk to my friends, because here it's just quiet. That's the only thing I miss, is being able like to walk out. And I know people but I really don't know nobody here. So it's like you have to budget better than you did before, because there you didn't have to worry about it, because you could just walk out the door and say, 'Hey, I need.'"*

Many of the Gautreaux Two respondents who made secondary moves felt disconnected from their primary support networks in their new neighborhoods and were unable to replace these with social ties in their placement neighborhoods. When asked what she thought about the Gautreaux program, Nikki said:

> *"I mean, I understand what they were trying to do. I do understand what they were trying to do and they were hoping to give people better opportunities, but to force people away, to force people away from their family, their support system. You know, just common things that people need to have. It's not beneficial. It's not beneficial and it causes more harm than good."*

For many of the secondary movers, wanting to live closer to their families and to others in their networks—often very much like them—who would offer ready support was a primary reason for their decision to make a secondary move. The desire to live closer to their families and others in their network also influenced the location of the second move. Sophie's Gautreaux unit was in Rogers Park, a neighborhood in Chicago's far North Side, and both she and her children missed the proximity to South Side family and friends. Sophie said:

> *"[I'm planning to] move. I want to go back down south where I come from. I don't too much care for the North Side. You know, now…I find my way around, but still, there ain't nothing like home. Well I don't have family over here. I got to go all the way out to visit them."*

Thus, Sophie still considered the South Side to be her home because of her familial ties and familiarity with the area.

Childcare

One primary way in which removal from social networks was difficult for participants was lack of access to previous forms of childcare. Many participants used informal childcare networks no longer accessible from their new neighborhoods or that required long commutes to drop their children off with family or friends, which created pressure in their daily schedules. Nikki, whose Gautreaux unit was in the suburbs, has three children. She had issues with childcare and had to travel quite a distance to drop the children off at their grandparents' house when she was working and they were not in school. Nikki explained this difficulty:

> *"I don't have anybody to get these kids. I don't have the money to take 'em to the daycare center over here, you know? The transportation. This place won't take 'em until this time. By the time I get them there, and I get back on my route, I'm late for work."*

Moving closer to family to receive childcare assistance was common among those respondents who made secondary moves. When asked about her primary reason for making a secondary move, Francine said:

> *"Actually, to be closer to my family, actually, and the benefit of somethin', you know? When I get sick, you know, I have someone [to] watch my daughter. So, that's really the number one priority."*

Transportation

Gautreaux Two respondents who moved farther away from the city proper had a difficult time with transportation, because public transportation becomes less available and more sporadic in these areas. Owning an automobile was a prohibitive expense for many of these families; therefore, reliance on public transportation was necessary for many. Some complained about more minor issues of parking, while others found the lack of good transportation and distance from relatives to be incredibly difficult, making transportation a primary reason for moving. Yolanda explained how lack of parking was a deterrent to her family's visiting her:

> *"[My family] don't come too much. Because when they come, [there's] nowhere to park. Yeah, [there's] nowhere to park so they like stoppin' me from havin' visitors. And then when they do come, you know, because from here to Chicago, it don't seem too far to some people, but some of 'em say it's too far to be, too far to drive. And then they come, [and they] have to turn around an' go back home [because there is no parking]. The parking is crazy out here."*

Some respondents had difficulty getting to their jobs, to childcare, and to their children's schools. When she moved to her Gautreaux unit in the suburbs, Lashonda kept the same job at a retail store that she had when she lived in her baseline neighborhood. A few months after making the Gautreaux move, she lost her job because she had a lot of transportation problems and was often late for work. Living closer to jobs was a primary reason for Lashonda's secondary move back to a nonopportunity area in the city.

For those respondents who had cars, the long commute time was very cumbersome. Many respondents also had a hard time with shopping and visiting healthcare providers; thus, navigating the opportunity areas was difficult. Some respondents lacked the support network of people who previously gave them rides, or they previously lived closer to these services. Many respondents still used their baseline area services, including healthcare services, and the distance to these services presented challenges. Tara still used the hospital in her baseline area and never became familiar with her Gautreaux neighborhood resources:

> *"I don't even know where the nearest hospital is. No. I would have to drive all the way to the South Side if I had [an] emergency. I would have to go to South Side."*

Public transportation was a primary reason why Joan left her Gautreaux area in the suburbs to move back to Chicago. She explained:

> *"What made me want to come back to the city? Well, the transportation. Transportation-wise, I don't have a car. It was like, if I'm in the city, [there are] buses here, buses there. I like that."*

Joan's story demonstrates that transportation is a primary issue; the suburbs do not provide adequate public transportation. For respondents who have no vehicle and who are removed from their social networks of people who previously gave them rides, the need for accessible public transportation was a motivating factor in their decision to move back to Chicago from the suburbs.

Children

The experiences of the respondents' children in the new neighborhoods also demonstrate the importance of social networks and the potential barriers to creating new networks. Some children experienced racially motivated incidents in their neighborhoods and schools, which contributed to the inability of some of the children to adapt to their new neighborhoods and schools. Akilah's 10-year-old son was called "nigger" repeatedly by several of the young children in their Gautreaux neighborhood in the North Side of Chicago, and such incidents point to the salience of race in creating possible barriers to the formation of social ties in the respondents' new neighborhoods.

Some respondents explained that their children found the Gautreaux neighborhoods boring and missed their baseline friends and visited them frequently, which illustrates the effect that distance from social networks had, even on the children. Nikki explained that her children thought the Gautreaux neighborhood in the suburbs was boring:

> *"[My children] play with some of the kids on the block, but not too much, not too much. So it's, I mean, it's really boring out here. It's really boring. It's nothing. Hey, you know, when I'm here and I'm out, I'll turn jump rope for one and you know, come out and play. But, it's like, they don't know what to do. I stick them outside, and they don't know what to do."*

Nikki made a secondary move to a nonopportunity area in the city because she wanted to be closer to her family network and her children wanted to be closer to their friends. Her oldest son was experiencing many problems in the school in the suburbs, and she sent him to live in the city with his grandparents, even before the rest of the family moved back to the city, so that he could attend a public school in the city. The experiences of her children and the difficulty they had making the transition to life in the suburbs were crucial factors in Nikki's decision to move back to Chicago from the suburbs.

Some respondents kept their children in their baseline schools even after they moved to their Gautreaux units. Maria made a Gautreaux move to the North Side of Chicago, but she kept her three children in the same school they attended when they lived in Robert Taylor Homes. She explained:

> *"I just want them to stay in one school because it changes them, you know? How schools be different, teaches them different. It would probably knock them off, so since they used to that, I let them go, just stay right there. They been going there, and I was raised like that, getting transferred, transferred, transferred, transferred, and I didn't want that [for my kids]."*

For Maria, keeping her children in the same school provided them with a sense of stability. Other respondents recognized that their children were doing better in the higher quality Gautreaux area schools, but this was not a strong enough factor to keep them from moving. Olivia, whose grandson lives with her, said one of the main reasons she moved to the suburbs was to provide her grandson with a better education. She recognized that he was doing much better in the school in her Gautreaux neighborhood, but she ended up moving to a nonopportunity area anyway because of her health issues and her desire to be in an area with better public transportation. Olivia said:

> *"That's the only part that makes me really hate to move. 'Cause he doing really, really good in school. He doing better in school out here than he ever did in his whole entire life."*

Karen also discussed the importance of education and the quality of schools in opportunity areas, but she also made a secondary move from the suburbs to a nonopportunity area:

> *"Like I said, I'm leaving the door open for an opportunity area. I know if I find an opportunity area, and move there, I know the schools are much better, and they have more programs, you know, available for your children, 'cause education is very important, you know?"*

Even though respondents recognized the quality of the schools in the opportunity areas, other costs, such as transportation and distance from family networks, outweighed this benefit.

Most of the respondents who made secondary moves were geographically distant from their social networks in their baseline neighborhoods, which resulted in issues of childcare, distance to employment, and transportation, particularly for those respondents whose placement neighborhoods were in the suburbs. As Shlay and DiGregorio (1985) discuss, women, particularly low-income single mothers, rely on public transportation provided by cities, and they want to live near their social and kin networks.

Public Housing

Respondents who moved through the Gautreaux program did not automatically adjust to their new neighborhoods and faced other issues, including poor-quality units and problematic landlords, all of which contributed to their desires to make secondary moves, often to nonopportunity areas. Yet, these respondents did not move back to public housing, and, although they missed things about their baseline areas, most were incredibly glad to be away from public housing. Whitney explained how happy she was to move out of Altgeld Gardens, one of Chicago's most isolated South Side public housing developments:

> *"The Gardens…it was depressing. I had to get [my kids] out of there. There's nothing I miss from out there and nothing I wanna go back to. Nothing. The Gardens just pushed me into the real world. That's all it did. And it's real world, real situations. I'm not gonna say I wanna go back. No."*

The Gautreaux program was still incredibly valuable for the respondents who made secondary moves, and it is important to compare the experiences of those who moved to nonopportunity areas with those who made secondary moves to other opportunity areas.

Stayer Comparison

Of the Gautreaux movers in the sample, 47 percent were still in their Gautreaux units by 2005. Comparing the stories of the secondary movers with the stories of the stayers once again highlights the importance of social networks, childcare, and transportation in shaping the experiences of respondents in their Gautreaux neighborhoods. The secondary movers appreciated many of the same things about their Gautreaux neighborhoods as the stayers did. Likewise, the respondents who stayed in their placement neighborhoods faced many of the same challenges that the movers did, but they were better able to finds ways to adapt. The stayer respondents either had family or friends in their placement neighborhoods or were still able to see their family and friends despite the distance, and they still received network support from them (for example, childcare). Some

respondents specifically chose their placement neighborhoods because they already had family or friends living in those areas.

Melissa moved to the suburbs from LeClaire Courts on Chicago's Southwest Side, and some of her friends from this area also moved through Gautreaux Two to the suburbs. These friends really helped Melissa with her transition to the suburbs:

> *"Yeah, [I have] friends that came from my old neighborhood. [They live] about five minutes [away], and I go visit them, go to the store and stuff like that. It helps me adjust more, you know, because I know somebody from my old neighborhood here."*

Beatrice chose her Gautreaux unit in the suburbs specifically for its proximity to her family:

> *"The reason why, we just looked [in] this area, [was] because I live[d] in this area. And it wasn't too far from my aunt, or you know, her sisters and stuff like that. So we wanted to stay in the same area with our family right down the street."*

For these stayers, having family and friends in the area to which they moved was a significant factor in their ability to adjust to their new areas and to continue to receive crucial network support.

Neighborhood Networks

The stayer respondents were more likely to create social ties in their new neighborhoods by getting involved in neighborhood activities and making friends with their neighbors than the secondary movers were. Vanessa moved to the far North Side of Chicago and made friends with some of her neighbors. She even provided daycare for one neighbor's children. In contrast to the stories of several respondents who made secondary moves, Vanessa said she got outside more after moving to her Gautreaux neighborhood:

> *"I mean, I do more things than I used to. The only thing I used to do, was either go to the show or go to my mom's house or something like that. But here, I take more walks. I'm an inside person, but I find myself now going outside more. I'll walk down the bike path. Or I may decide to walk further up Sheridan into Evanston. I find myself outside doing a lot more walking than [before]. Everywhere I went there, I would take the bus. It's just, I learn the neighborhood by walking around and learning the different little things, the activities and stuff they have in the neighborhood. So I find myself getting outside more here, around here, than I did [before]."*

Evelyn moved to an opportunity area on the Southwest Side of Chicago, and she quickly developed a strong neighborhood network. On the day that she moved into her unit, her neighbors introduced themselves and showed her around the neighborhood:

> *"I had a couple of people in the neighborhood to show me around, different little places, little social groups, where to vote, play bingo, stuff like that."*

This outreach helped Evelyn feel connected to both her neighbors and the resources in the area and made the transition to her new neighborhood smoother. She took advantage of the opportunities around her, and having her neighbors connect her to the area resources was crucial to her adjustment.

Transportation

The respondents who stayed in their placement neighborhoods also found ways to make transportation work—they either had cars or lived in areas with good public transportation. Other respondents received rides from family or friends who lived nearby. Many respondents appreciated the convenience of the areas where they lived. Another reason that Evelyn loved her Gautreaux neighborhood so much is the convenience of it:

> *"I love it, 'cause everything's right here. The store's on the corner, restaurant's right up the street. Either way you go, restaurants around, little places. Bus stop right outside. Don't have a car, drop you off, so, nope…love everything. Love everything."*

Some respondents found opportunity areas close to their jobs, and this helped make the transition easier. Lauren felt like she got her job at a department store because her Gautreaux unit is close to the store:

> *"If I would have never moved out here, I wouldn't have never had this job. You know, 'cause I would have never looked down here."*

Adele also found a Gautreaux unit closer to her job in the suburbs:

> *"So, that's the advantage of me moving, because when they gave it to me and I could move, I said, 'Well, let me see if I can find something closer to work.'"*

Respondents who did not need to travel long distances for work or childcare and who either had cars or the network support of people who gave them rides were much more capable of adjusting to their new neighborhoods than those who had difficulties with transportation. Adequate access to transportation was a crucial factor that kept respondents in their Gautreaux neighborhoods.

Children

Many of the respondents wanted their children to be in areas with diversity, as Vanessa said when she discussed how her Gautreaux neighborhood on the North Side of Chicago has been for her two children:

> *"It's been really good for them. Deanna has a lot of different friends as far as races, and that's something that I wanted them to experience—the different nationalities of people and how it can be an advantage or disadvantage to you."*

Many of the stayer children became involved in their neighborhoods in different activities and made friends in their schools and the neighborhood in general. Evelyn's two children were involved in an after-school program at the Boys and Girls Club, which is an income-based program, making it affordable for her to send them there:

> *"I wanted a change, new environment. Like I was explaining at first over there, Altgeld Gardens, which is a projects, it was bad: drug dealers, shootings and the kids really couldn't come out and play. At a certain [time you would be told], hey, you can't have your kids out, 'cause such and such is going to shoot, or whatever. A whole bunch of stuff. But now, they go out. [There are] parks around. Basketball court, lunch, social activities and stuff, after school events for them. A whole bunch of little stuff, so it's nice."*

Having an income-based program was an important resource that the community provided that enabled Evelyn's children to take advantage of neighborhood activities.

A lot of children did better in their Gautreaux area schools than in their baseline schools, and respondents recognized the high quality of the opportunity area schools. Veronica discussed wanting to stay in her Gautreaux area in the suburbs for the sake of her niece who is doing well in her new school:

> *"Yeah, because I want to keep Tiffany in [her new school]. You know, that's my whole thing. You know, she's doing so well. Like I said, she's in honors at school, and I don't want to pull her away from that. Wherever I move, she might get discouraged and go down, you know? I want to keep her head up."*

Stayer respondents also reported that their children are doing better in their opportunity areas in general and that they like their neighborhoods. The children of the respondents who stayed in their placement neighborhoods were more likely to become involved in different activities in their neighborhoods and make friends in their schools than the children of the movers.

Vanessa reported that her daughter is doing better in the Gautreaux area than she did in her baseline neighborhood:

> *"There, you have to let people know, I'm not scared of you, and you know, you have to be always on the defensive where you have to have your guard up at all times. But here, she's starting to let her guard down. She's starting to be more relaxed. Her temper has changed. She's now less aggressive than she used to be. She won't let nobody pick on her or walk on her, but she's not as aggressive as she was before. So I think her surroundings [are part of that]; her teachers that she have, the input that they give, her friends, and me. You know, [I'm] still saying the same things that I said before, [but now] she starting to hear it. It's kind of sticking now."*

Mia explained that her son did not like the Gautreaux area at first, but he adjusted and now does not want to move:

> *"It was a culture shock to him. The first year, he didn't like it here. He really hated it. He was the only black kid in his classes. Now he don't want to move from here. He also doesn't like going to the projects anymore."*

The story of Mia's son demonstrates that it takes time for children to adjust to new neighborhoods and develop connections with other youth as well as neighborhood and school resources.

Conclusion

By 2005, 53 percent of the Gautreaux Two participants in the qualitative sample had made a secondary move, and 81 percent of these moves were to nonopportunity areas. This high percentage of secondary moves to less advantaged neighborhoods calls for assessment of the factors influencing families' experiences in their new neighborhoods and decisions about whether to stay in their placement neighborhoods. The results of this analysis show that social networks are a key factor in decisions about moving, because distance from kin and support networks and difficulty

in creating new social ties in placement neighborhoods result in social isolation and transportation difficulties and motivate secondary moves. Family responsibilities such as childcare and caring for other family members exacerbated the effect of moving away from baseline neighborhoods with kin networks. On the other hand, social network factors were also primary reasons why some respondents remained in their placement neighborhood. Stayer respondents were more likely than secondary movers to have moved to a neighborhood where they already knew people, and they were able to maintain ties with kin, develop relationships with new neighbors, and become involved in their placement neighborhoods. Access to good public transportation or the use of a car facilitated the maintenance of social ties.

Briggs (1998) offers an analysis of social capital that provides insight into the different facets of the Gautreaux participants' social networks. He classifies two dimensions of social capital: social support and social leverage. Social support is the type of social capital that helps one to get by and cope with one's circumstances. This type of social capital is particularly important for the poor and involves having locally based, homogenous social ties. Social leverage, on the other hand, is having access to more diverse ties that enhance one's opportunities and help one get ahead (Briggs, 1998). Although the baseline neighborhoods of the Gautreaux participants may not have provided much social leverage, they did provide crucial social support. When the women moved to new neighborhoods, these social support networks were often disrupted because the social ties needed to create these networks take time to develop, and race, class, gender, and spatial barriers can make the creation of these social ties challenging.

It is important to recognize the barriers to creating social ties in new neighborhoods and to consider what other support services need to be implemented to assist movers in their transitions to new neighborhoods. As Reed, Pashup, and Snell (2005) discuss in their analysis of the Gautreaux Two program's influence on labor force participation, many participants who moved did not choose their neighborhoods based on specific occupational or educational opportunities and, therefore, do not have these specific ties to their placement neighborhoods. As this analysis shows, participants who moved to a neighborhood where they already had a social network were more likely to feel connected and remain in the placement neighborhood. Thus, having preexisting ties to a neighborhood assists in the transition process and the lack of those ties makes the process much more difficult.

As Boyd et al. (2007) suggest, several policy recommendations include encouraging families to move to neighborhoods where they have family or friends, or to facilitate the ability for people to move in family groups rather than individually. Another possibility is to require the initial voucher to be used for 2 years in the placement neighborhood rather than just 1, which would provide a longer timeframe for participants to develop new social ties before making decisions about moving elsewhere. These policy recommendations involve possible changes in the way housing mobility programs are designed and emphasize the need for further preplacement location counseling to give voucher recipients a more realistic picture of the challenges they may face and ways to mitigate these challenges. An additional policy implication of this analysis is the importance of continued program assistance for participants beyond the initial placement, because families who move to new neighborhoods need more support connecting with neighborhood networks and services to overcome potential barriers of race, class, and gender differences. Local institutions

such as churches, community groups, and schools can help families make the transition into new neighborhoods and support both adults and youth in connecting to peers and resources in the community to gain necessary social capital that could result in participants' ability to get ahead.

The results of the Gautreaux Two program have implications for the HCVP because families who receive a voucher likely face many of the same obstacles that the Gautreaux Two participants did. The insight from the Gautreaux Two participants' experiences can shed light on the processes and outcomes of the HCVP, because it is important to know the reasons behind families' residential moves. The policy recommendations for the Gautreaux Two program could prove helpful when considering what further support systems would benefit HCVP recipients. Future qualitative research should be done with HCVP recipients in other metropolitan areas to further our understanding of how recipients make housing choices and what additional resources recipients need.

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Measuring the Deconcentration of Housing Choice Voucher Program Recipients in Eight U.S. Metropolitan Areas Using Hot Spot Analysis

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Abstract

This article describes the use of hot spot analysis to measure changes in the clustering of U.S. Department of Housing and Urban Development (HUD) Housing Choice Voucher Program (HCVP) recipients. Hot spot analysis for HCVP recipients in eight metropolitan areas (New York, Baltimore, Chicago, Cincinnati, Miami, Houston, Los Angeles, and Phoenix) was performed using the tenant-based data system from HUD's Office of Public and Indian Housing. The 2000 and 2005 hot spots were overlaid with 2000 Census block group data. The hot spot results show that the tendency of HCVP households to cluster varies by metropolitan area; however, no evidence indicates that HCVP clustering is declining. Although HCVPs are becoming less concentrated in hot spots in Chicago and Phoenix, the opposite is true in other metropolitan areas, especially in New York, Cincinnati, and Baltimore. This type of HCVP concentration is likely to continue as long as affordable rental housing is confined largely to central cities and older inner suburbs.

Introduction

Since 1980, the thrust of U.S. low-income housing policy has shifted from supply-side to demand-side subsidies. The main focus of the U.S. Department of Housing and Urban Development's (HUD's) Housing Choice Voucher Program (HCVP)—a demand-side subsidy—is to enable low-income households to afford safe and decent housing. HUD is also using the HCVP to improve access to low-poverty neighborhoods, and, in turn, to deconcentrate poverty.[1]

This study builds on previous HUD national research on the spatial distribution of HCVP recipients (HUD, 2003, 1998) as well as our own 2005 *Housing Studies* article (Wang and Varady, 2005) that provides a snapshot view of the spatial distribution of HCVP recipients in Hamilton County, Ohio (the core county in the Cincinnati Consolidated Metropolitan Statistical Area [CMSA]). In this article, we aim to answer the following four research questions:

1. To what extent has the HCVP shifted to the suburbs between 2000 and 2005? That is, to what extent has the distribution of HCVP clients changed between the central city and the remainder of the metropolitan area?

2. To what extent has the HCVP helped to deconcentrate poverty? Specifically, to what degree has the HCVP shifted from high- to low-poverty census block groups?

3. To what extent has the administration of the HCVP led to a decreased propensity for recipients to cluster spatially? That is, how prevalent is the tendency for HCVP recipients to live in high HCVP density clusters (that is, HCVP hot spots)? Is the tendency to cluster most apparent in hot housing markets in which HCVP recipients have the fewest opportunities to find affordable rental housing?

4. To what extent have these hot spots changed between 2000 and 2005? For particular metropolitan areas, where have the 2000 hot spots disappeared and where have new hot spots emerged by 2005?

This article helps to clarify whether HUD's current focus on vouchers without restrictions on geographical destination and without intensive counseling is leading to a shift of households to low-poverty neighborhoods where the density of HCVP households is low.[2]

The U.S. Census Bureau divides the country into four regions—Northeast, Midwest, South, and West. When we started this research project, our goal was to select two metropolitan areas from each region based on three criteria: (1) that each metropolitan area should contain at least two million people, (2) that each should contain a large proportion of African Americans and

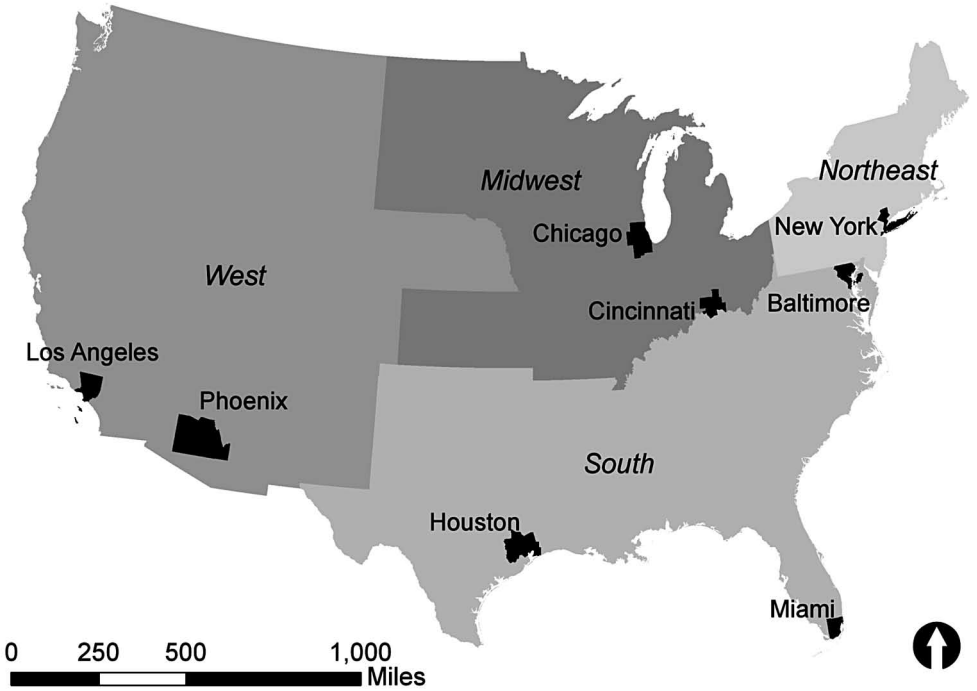
[1] HUD's emphasis on poverty deconcentration is reflected in HUD's Section Eight Management Assessment System. HUD provides five points to housing agencies that can demonstrate that an increasing proportion of Housing Choice Voucher Program households with children are moving to low-poverty census tracts. (See HUD, 2001.)

[2] Here we are distinguishing between the regular operation of the Housing Choice Voucher Program and two major HUD demonstration programs, the Gautreaux Assisted Housing Mobility Program in Chicago and the Moving to Opportunity for Fair Housing Demonstration.

Hispanics, and (3) that the two selected for each region should include a so-called "hot" housing market (that is, where it is necessary to have a relatively high income to afford an apartment) and a so-called "cool" one. Exhibit 1 shows the eight metropolitan areas that we ultimately selected with respect to total population size and demographic and housing characteristics. Exhibit 2 shows how the eight metropolitan areas differ in the three criteria. For example, both New York and Baltimore have similarly high proportions of African Americans, but New York's housing market is much hotter than Baltimore's as shown by the higher income required to afford a two-bedroom apartment at or below the Fair Market Rent (FMR) standard.[3]

Exhibit 1

Study Areas



Sources: Regional boundary data were derived from 2004 ESRI data set; metropolitan boundary data were provided by HUD in 2006

[3] We originally chose Philadelphia as the comparison metropolitan area for New York. Philadelphia is a Moving to Work site. For several years, the Philadelphia Housing Authority has been permitted to skip reporting its Housing Choice Voucher Program data to HUD. We replaced Philadelphia with Baltimore. Although technically Baltimore is a southern city, in actuality it resembles Philadelphia and other northeastern cities for spatial structure (that is, like Philadelphia, Baltimore has a historically important downtown core), a declining manufacturing base, and a large African-American population.

Exhibit 2

Socioeconomic and Housing Characteristics of the Eight Metropolitan Areas

Metropolitan Area	Region	2000 Population (in millions, U.S. Census)	Ethnic Minorities[a]	FMR for Two-Bedroom Apartment[b] ($)	Income Required To Afford Two-Bedroom Apartment at or Below FMR Standard[b] ($)	Median Household Income in 1999 (in $, U.S. Census)	African-American Residents (%)	Hispanic Residents (%)	Households Below Poverty (%)
New York	Northeast	12.1	High African-American/ high Hispanic	1,189	45,320	50,795	20.78	21.74	15.49
Baltimore	Northeast	2.6	High African-American/ high Hispanic	941	37,640	49,938	27.21	2.02	9.72
Miami	South	2.3	High African-American/ high Hispanic	1,018	40,720	38,632	20.07	57.32	18.08
Houston	South	4.2	High African-American/ high Hispanic	768	30,720	44,761	17.45	29.90	12.34
Chicago	Midwest	8.3	High African-American/ high Hispanic	935	37,400	51,046	18.75	17.12	9.67
Cincinnati	Midwest	1.6	High African-American/ high Hispanic	668	26,720	44,914	12.97	1.08	10.06
Los Angeles	West	9.5	High African-American/ high Hispanic	1,269	50,760	45,903	9.63	44.58	15.13
Phoenix	West	3.3	High Hispanic	782	31,280	44,752	3.58	25.13	9.88

FMR = Fair Market Rent.

[a] *See Frey (2006).*

[b] *See NLIHC (2005).*

Source: 2000 Census and Housing Choice Voucher Program data provided by HUD in 2006

Methods

We conducted our spatial analysis in three steps. First, we developed a database for the selected metropolitan areas using ArcGIS, a commercial Geographic Information System (GIS) software package. Exhibit 3 summarizes the data layers included in the databases. Second, we produced maps describing the distribution of HCVP recipients for the metropolitan areas. Third, we identified hot spots in each metropolitan area in 2000 and 2005 and summarized census block group data by hot spots.

Exhibit 3

Sources for Data Layers Used

Data Layer	Data Source
2000 and 2005 individual HCVP recipient points	HUD HCVP recipient data
Census block group polygons	ESRI compiled from TIGER file
Metropolitan polygons	ESRI compiled counties from TIGER file
County polygons	ESRI compiled from TIGER file
Central city boundary polygons	HUD
Major highway polylines	ESRI compiled from TIGER file
ZIP boundary polygons	ESRI compiled from TIGER file
Major surface water polylines	ESRI compiled from TIGER file
Census block group level attribute data: % African Americans, % Hispanics, % households below poverty, median household income, number of rental units	HUD

HCVP = Housing Choice Voucher Program.

We used the longitude/latitude location of HCVP recipients to create an ArcGIS point feature layer for 2000 and 2005 HCVP recipients. For HCVP recipient records without longitude/latitude data, we geocoded them using ZIP Code location; that is, we placed them on the center of the corresponding ZIP Code. We included these records only in the analysis of the distribution of HCVP recipients with respect to central city versus suburbs and not in the hot spot analyses. The HCVP recipient records that lacked longitude/latitude and ZIP Code data were excluded from all analyses. Exhibit 4 summarizes the data for each metropolitan area.[4] After overlaying the census data with the 2000 and 2005 HCVP recipient data, we produced a series of dot maps to describe the distribution of HCVP recipients in each metropolitan area. For space reasons, we do not include or discuss these maps in this article.

[4] Note that in 2000, more than 4,000 Housing Choice Voucher Program records for Chicago were missing location data, a much larger number than for any other metropolitan area.

Exhibit 4

HCVP Information for the Eight Metropolitan Areas

Metropolitan Area	Counties	Year	Total HCVP Records	HCVP Records Geocoded With x, y Coordinates	HCVP Records Geocoded With ZIP Code	HCVP Records Not Gecoded Because of Missing Information
New York	NY: Bronx, Kings, Nassau, New York, Putnam, Queens, Richmond, Rockland, Suffolk, Westchester	2000	66,865	59,645	6,416	804
		2005	132,427	126,355	6,014	58
Baltimore	MD: Anne Arundel, Baltimore, Carroll, Harford, Howard, Queen Anne's	2000	10,290	9,915	309	66
		2005	21,175	20,979	170	26
Miami	FL: Miami-Dade	2000	13,005	12,547	437	21
		2005	21,130	20,758	370	2
Houston	TX: Chambers, Fort Bend, Harris, Liberty, Montgomery, Waller	2000	9,803	9,341	428	34
		2005	16,198	15,785	403	10
Chicago	IL: Cook, DeKalb, DuPage, Grundy, Kane, Kendall, Lake, McHenry, Will	2000	46,462	39,775	2,586	4,101
		2005	57,190	54,083	3,099	8
Cincinnati	KY: Boone, Campbell, Gallatin, Grant, Kenton, Pendleton; OH: Brown, Clermont, Hamilton, Warren; IN: Dearborn, Ohio	2000	9,125	8,639	463	23
		2005	15,330	14,892	431	7
Los Angeles	CA: Los Angeles	2000	51,736	51,277	429	30
		2005	76,134	75,648	485	1
Phoenix	AZ: Maricopa, Pinal	2000	8,708	8,602	92	14
		2005	11,811	11,628	140	43

HCVP = Housing Choice Voucher Program.

Source: 2000 Census and HCVP data provided by HUD in 2006

We used hot spot analysis to identify areas with a high density of voucher recipients. For each metropolitan area, we created an HCVP-recipient density raster grid using the floating grid technique described in our 2005 *Housing Studies* article (Wang and Varady, 2005).[5] From the 2000 HCVP density, we calculated the highest density in a metropolitan area. Hot spot areas include any area with a density greater than half of this highest density. Then we defined 2005 hot spot areas using the same density threshold value.[6] Exhibit 5 summarizes the raster cell size, the search radius,[7] and the hot spot threshold values for each metropolitan area. Note that we identified the hot spot areas by analyzing the density distribution for each metropolitan area independently. This approach enabled us to look at HCVP density in tandem with the population density for that particular metropolitan area. In other words, it would be expected that the HCVP density would be highest in New York, Chicago, and Los Angeles, where the population density is highest. Because this study focuses on variations in HCVP concentration among these different metropolitan areas and the changes in HCVP density between 2000 and 2005, we have not examined the link between HCVP density and the density of below-FMR units, the density of project-based assistance, or population density as a whole. Future research should be directed at these statistical relationships.

Exhibit 5

Hot Spot Parameters

Metropolitan Area	Cell Size (feet)	Search Radius (miles)	Maximum Density		Hot Spot Threshold
			2000	2005	
New York	500	0.50	3,275	6,778	1,637
Baltimore	500	0.50	1,149	1,766	575
Miami	500	0.30	1,558	2,264	779
Houston	500	0.75	296	532	148
Chicago	500	0.50	2,177	2,050	1,088
Cincinnati	500	0.50	579	979	290
Los Angeles	500	0.50	2,720	3,566	1,360
Phoenix	500	1.00	192	191	96

[5] Previously, hot spot analysis has been used in criminological and epidemiological research (Harries, 1999).

[6] The literature on spatial analysis provides no operational definition of the term "hot spots." In fact, Harries (1999) argues that no single, absolute definition may be possible. Choosing a threshold level for identifying hot spots is as much an art as a science. For our 2005 *Housing Studies* article (Wang and Varady, 2005), we experimented with different threshold values. The 50-percent figure proved best for estimating and describing spatial patterns. Atkinson and Unwin (2002) provide support for our approach, stating that subjective judgment based on a range of density surfaces is a method that is as good as any.

[7] The search radius is the distance used to define a circle for calculating each cell's Housing Choice Voucher Program recipient density.

After overlaying the 2000 and 2005 hot spots, we divided the census block groups for each metropolitan area into four categories:

1. Ongoing hot spot areas: census block groups that included or touched hot spots in both 2000 and 2005.
2. Disappearing hot spot areas: census block groups that included or touched hot spots in 2000 only.
3. Emerging hot spot areas: census block groups that included or touched hot spots in 2005 only.
4. Non-hot spot areas: census block groups that did not include or touch a hot spot in either 2000 or 2005.

We compared these four categories of census block groups for the proportion of poverty households, African-American households, and Hispanic households.

Census Block Group Analysis

In this section, we first compare the eight metropolitan areas with respect to changes in HCVP recipient densities. We then compare the eight with respect to the distribution of HCVP recipients between the central city and the rest of a metropolitan area. Finally, we examine the extent to which the administration of the HCVP is linked to poverty and minority deconcentration.

Changes in Overall Voucher Density

In all eight metropolitan areas, the number of voucher recipients increased substantially between 2000 and 2005. The greatest increase in absolute terms was in New York (an increase of 66,308 households), but the largest percentage increase was in Baltimore (106.9 percent). The Cincinnati metropolitan area experienced a 68.3-percent increase. The smallest increase in absolute numbers was in Phoenix; however, because of the small number of HCVP households in Phoenix in 2000, the percentage increase, 35 percent, was similar to the change in Chicago.

The wide variation in overall voucher densities among the metropolitan areas, in general, is consistent with differences in overall household density. In 2000, the highest voucher density, at about 27 households per square mile, was in New York; the second highest density, at 13 households per square mile, was in Los Angeles; and the lowest voucher density, at less than 1 household per square mile, was in Phoenix.

The New York metropolitan area, with the largest increase in HCVP recipients, also had the greatest increase in density between 2000 and 2005, doubling from 27 households per square mile to 55 households per square mile. In Baltimore, the HCVP density also doubled during this period, from 3.9 to 8.0 households per square mile, but the density level in 2005 was much lower than in New York. With the exception of Phoenix, all the other metropolitan areas experienced fairly large percentage increases in overall voucher density. In Phoenix, the overall level of voucher density remained at less than 1 household per square mile.

Houston stood out as the highest of the eight metropolitan areas with respect to the proportion of HCVP households, with 5.4 percent in 2000 and 9.0 percent in 2005. Phoenix had the lowest proportion, at less than 1 percent, while the other six cities varied between 1 and 3 percent.

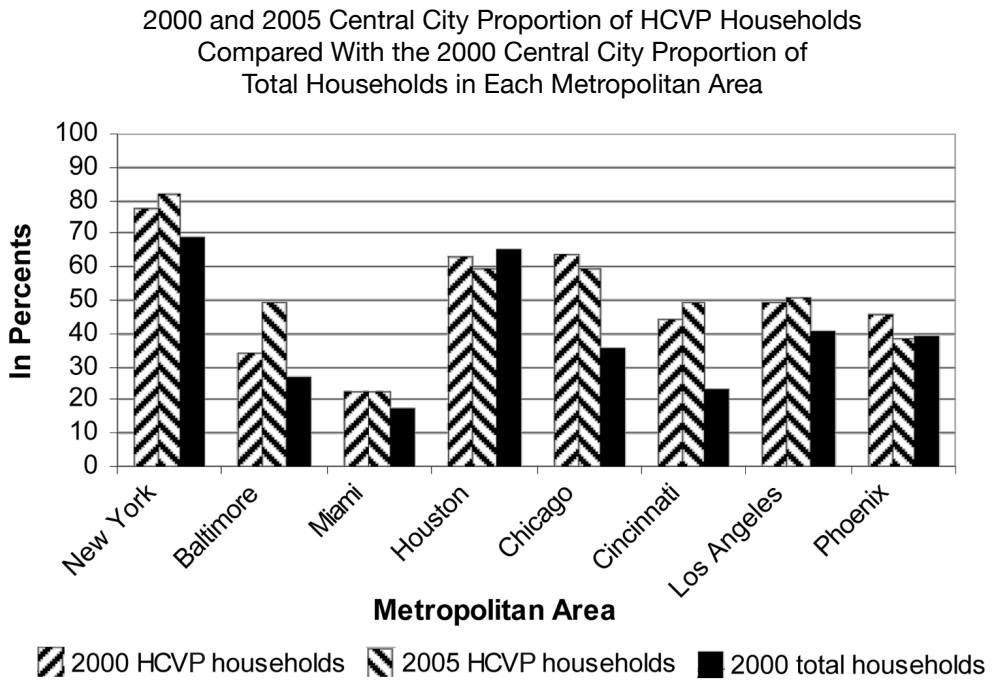
Changes in the Distribution of HCVP Households Between the Central City and Its Suburbs

The eight metropolitan areas vary considerably in the distribution of HCVP households between the central city and the rest of the metropolitan area (exhibit 6). In 2000, slightly less than 80 percent of HCVP recipients in the New York metropolitan area lived in New York City. In sharp contrast, only about 20 percent of HCVP recipients in the Miami region lived in the city of Miami. Between 2000 and 2005, almost no change occurred in the city/suburban distribution of HCVP recipients in Miami and Los Angeles. The biggest change took place in Baltimore, where the proportion of HCVP households living in the city of Baltimore rose from 34 to 49 percent. In contrast, the proportion of HCVP households living in the central city decreased slightly in Phoenix, Chicago, and Houston but increased slightly in Cincinnati and New York.

In general, the concentration of HCVP households in a central city reflects the city-suburban distribution of all households in that metropolitan area; however, our eight metropolitan areas

Exhibit 6

Proportions of Total and HCVP Households Living in the Central City



Source: 2000 Census and Housing Choice Voucher Program data provided by HUD in 2006

showed some variation in distribution patterns. In Chicago and Cincinnati, the proportion of HCVP households living in the central city was much higher than it was for all metropolitan area households. In Houston, which differed from the other seven metropolitan areas, the proportion of HCVP households living in the central city was lower than it was for all metropolitan households.

We also suspected that the concentration of HCVP households in the central city also reflected the concentration of rental units there. As predicted, for all of the eight metropolitan areas, the proportion of rental units in the central city was substantially higher than for the metropolitan area as a whole. For example, in the city of Cincinnati, the incidence of renting (54.3 percent) was 75 percent higher than it was for the metropolitan area as a whole (31.2 percent). In Miami and Chicago, the incidence of renting in the city was 50 percent higher than it was for the metropolitan area as a whole.

Poverty and Minority Deconcentration

The presumed linkage between HCVP household concentrations and poverty concentrations varied between cities. We defined "higher poverty" level census block groups as ones where 20 percent or more of the households were below the poverty line.[8] In New York, in 2000, three-fifths of HCVP households lived in higher poverty census block groups; the comparable figure for Phoenix was less than one-third. No one pattern of change occurred between 2000 and 2005. In five metropolitan areas, the proportion of HCVP households living in higher poverty areas declined, with big drops occurring in Phoenix, Houston, and Chicago. The proportion increased slightly in New York and Los Angeles while it decreased a little in Miami and Cincinnati. The maps (not included here) show that, except for Phoenix, almost all the higher poverty areas contain some HCVP households.

Not surprisingly, there was a link between where HCVP recipients and African-American families are located. This scenario was most evident in Chicago, where two-thirds of HCVP households lived in census block groups where 30 percent or more of the residents were African American. Relatively little change occurred, however, between 2000 and 2005 in the extent to which HCVP households were concentrated in heavily African-American areas. The most significant increase was in Cincinnati, where the proportion rose from 45 to 50 percent.

The connection between HCVP concentrations and Hispanic populations was most apparent in Miami and Los Angeles, where in 2000 nearly three-fourths of HCVP households were located in census block groups where Hispanics made up 30 percent or more of the total population. Because Cincinnati had only a small Hispanic presence (no census block groups were 30 percent or more Hispanic), no meaningful correlation was found between HCVP recipients and Hispanic concentration. Between 2000 and 2005, a fairly large drop occurred in the extent to which Phoenix HCVP households lived in heavily Hispanic areas. Meaningful but less noticeable decreases were observed in Miami and Houston and even smaller changes were calculated in the other three metropolitan areas.

[8] Most recent research has defined high-poverty areas as census tracts where 40 percent or more of the households live below the poverty line.

Hot Spot Analysis

Our hot spot analysis was carried out in three steps. First, we computed the cell-based HCVP recipient densities for the eight metropolitan areas for 2000 and 2005. Next, we compared the eight areas' hot spots with respect to the size of the hot spots, their spatial distribution, and changes between 2000 and 2005. Finally, we overlaid the hot spots on census block group data and maps, thereby enabling us to compare ongoing, disappearing, emerging, and non-hot spot areas.

Changes in Density

After dividing the nonzero HCVP density cells into four quartiles based on the 2000 densities, we calculated the mean density for each quartile and mapped the results. (Because of space limitations, these maps are not included in this article.) In general, fairly small differences occurred among the eight metropolitan areas with respect to mean HCVP density for the first three quartiles. Wide variation occurred, however, among the eight for the highest density quartile. Although the mean density for the New York metropolitan area in 2000 was 300 HCVP households per square mile in the highest density quartile, the mean density in the highest density quartile in Phoenix was only 48 households per square mile.

We used the 2000 density threshold values to group the 2005 density cells into four classes. A comparison of the 2000 and 2005 results showed virtually no change for the first three classes but large increases for the fourth density class. The biggest density increase, from 300 to 498 households per square mile, or 66 percent, occurred in New York. Baltimore experienced the second largest percentage increase, 46 percent, rising from 103 to 150 households per square mile. Cincinnati and Los Angeles also experienced meaningful increases, but Miami's and Chicago's increases in density were negligible. Houston and Phoenix experienced decreases in HCVP density of 17 and 6 percent, respectively.

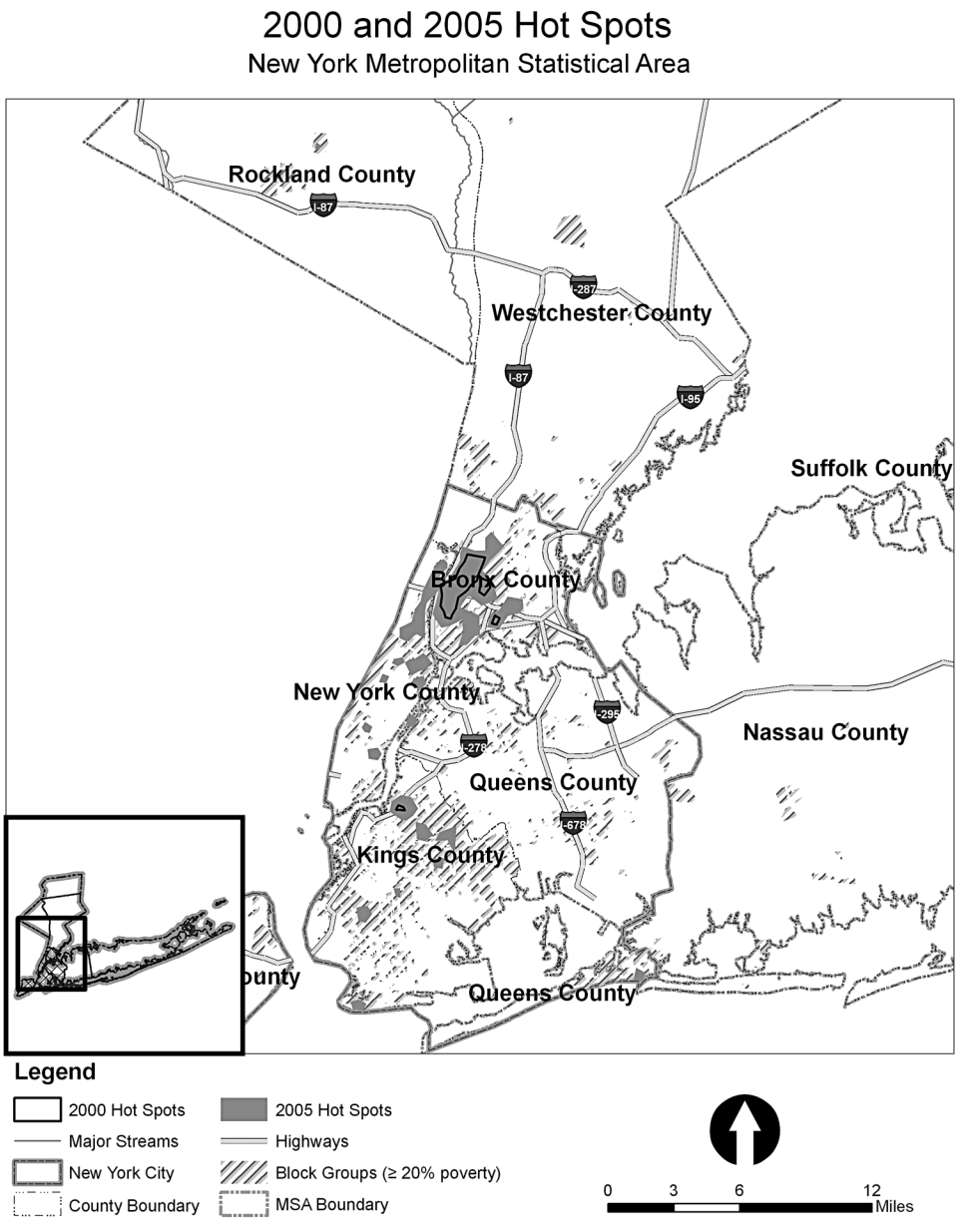
Overall Description of Hot Spots

Exhibits 7 through 14 show the location of hot spots for the eight metropolitan areas in 2000 and 2005. Exhibit 15 compares the metropolitan areas for changes in the proportion of HCVP households residing in hot spots. In the New York metropolitan area, most hot spots are in New York City. The large increase in HCVP households in New York between 2000 and 2005 was accompanied by a five-fold increase in the size of the area encompassed by hot spots (from 2.9 to 15.7 square miles).[9] Furthermore, the growth in the size of hot spots in New York was accompanied by an increase in the mean density of HCVP households in those hot spots (increasing 25 percent from 2,193 households per square mile to 2,743 households per square mile). As a result, New York stands out from the other metropolitan areas based on the high proportion of HCVP households living in hot spots (41 percent). New York's hot spots were entirely concentrated in New York City in both 2000 and 2005. In 2000, the city hot spots were in northern Manhattan, southern Bronx, and northern Brooklyn. Between 2000 and 2005, hot spots spread over more of these three boroughs.

[9] Comparisons across metropolitan areas based on hot spot results must be made cautiously; see the concluding section of this article.

Exhibit 7

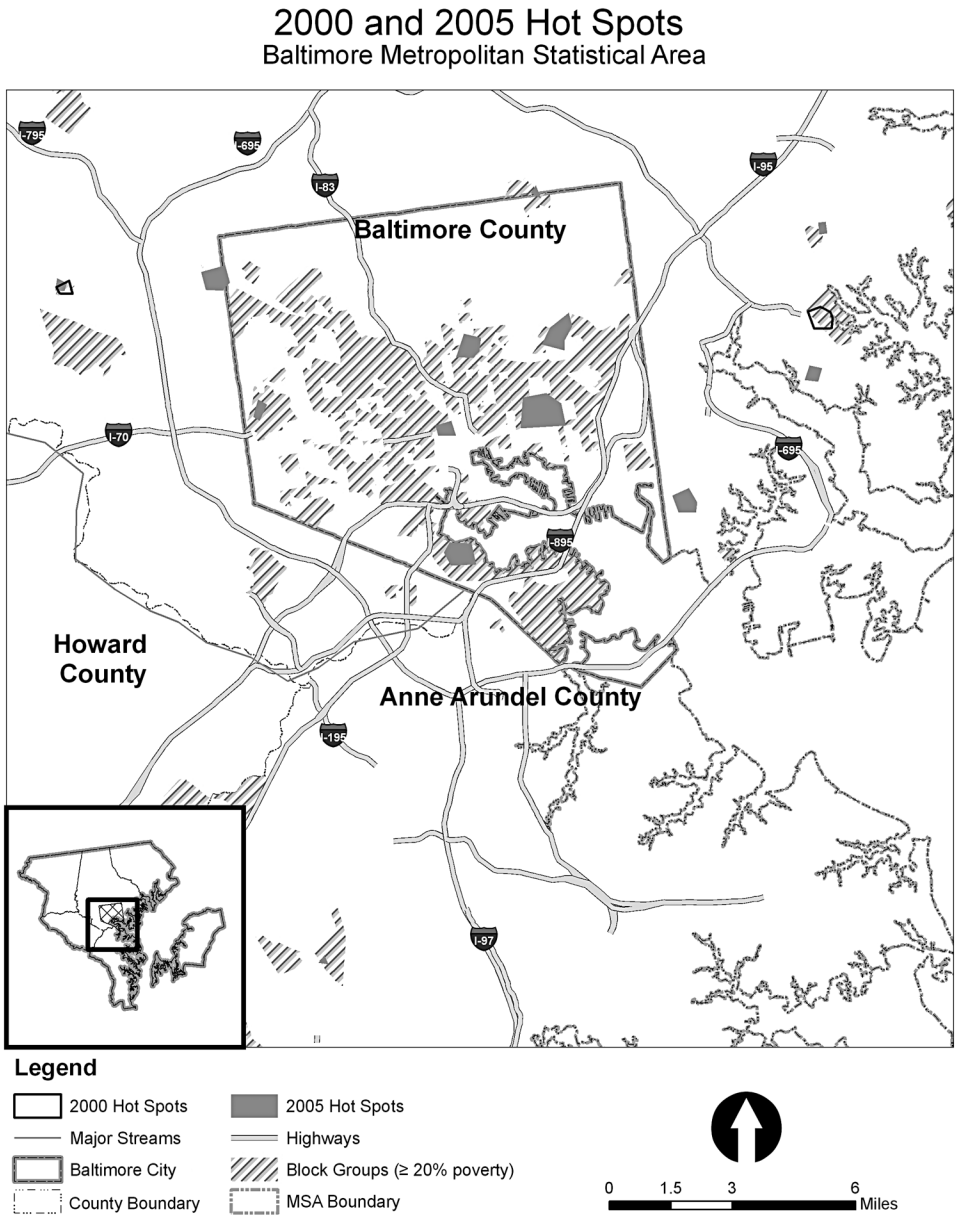
Hot Spots in New York



Sources: Metropolitan and city boundary data provided by HUD in 2006; census block, highway, and stream data obtained from the 2004 ESRI data set

Exhibit 8

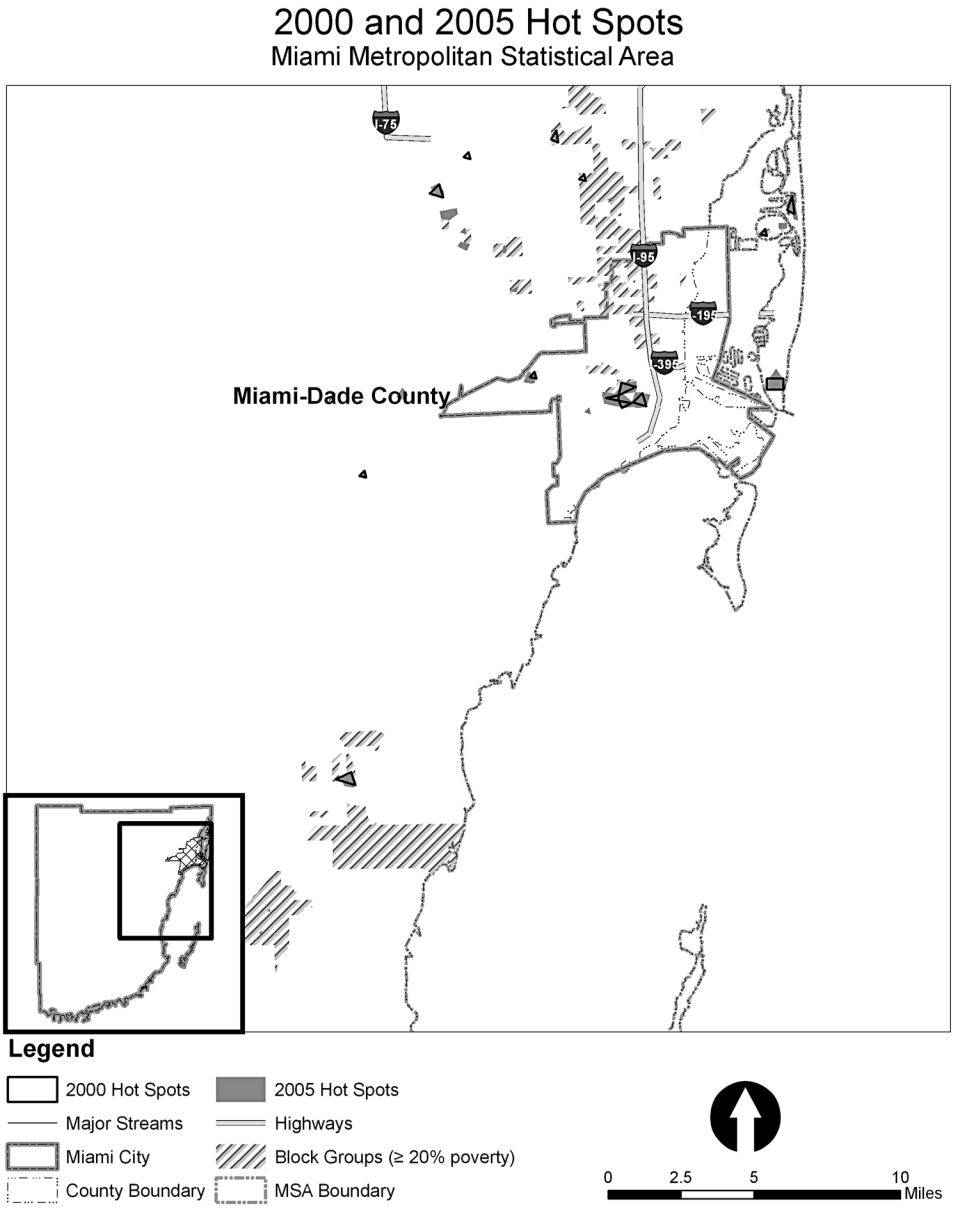
Hot Spots in Baltimore



Sources: Metropolitan and city boundary data provided by HUD in 2006; census block, highway, and stream data obtained from the 2004 ESRI data set

Exhibit 9

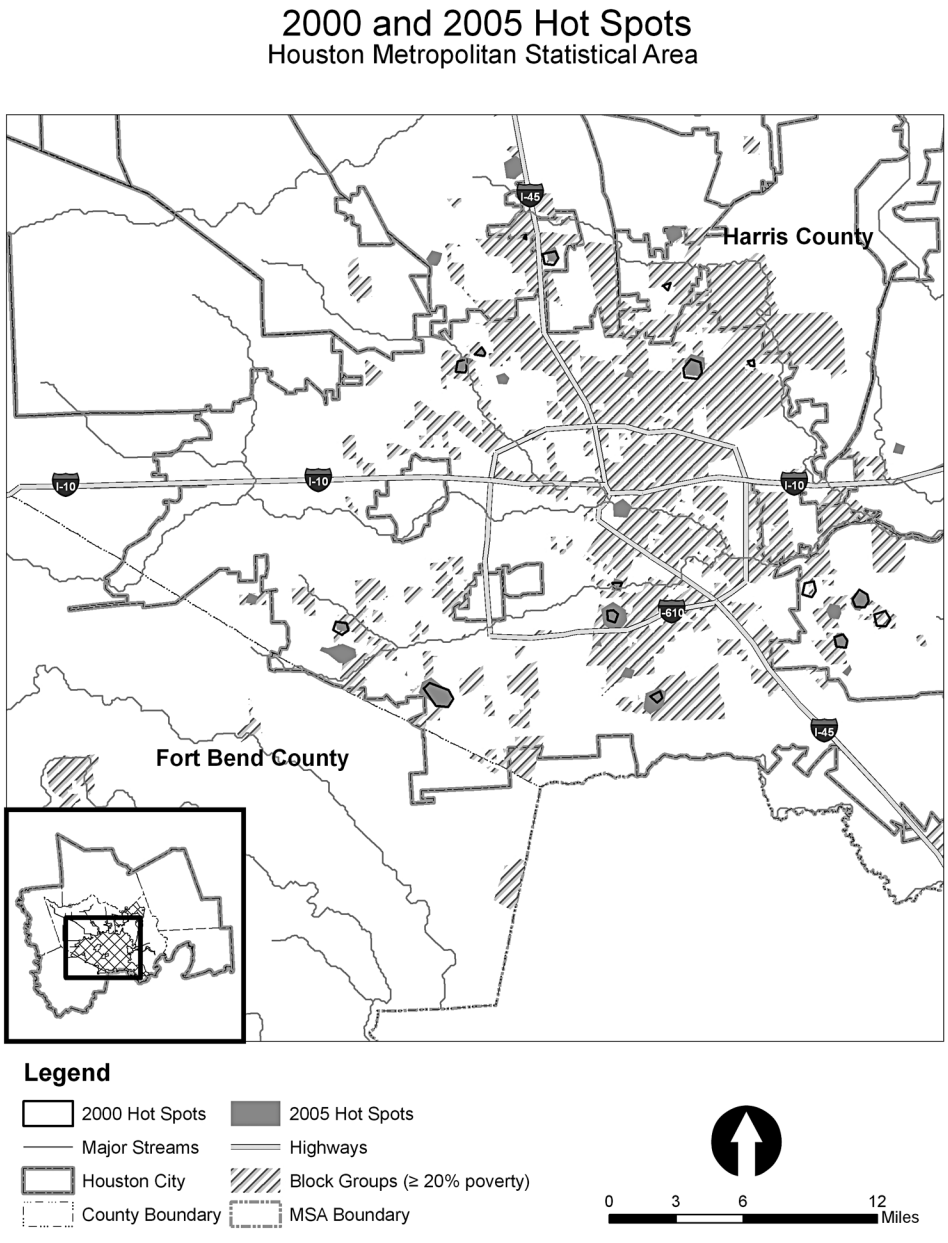
Hot Spots in Miami



Sources: Metropolitan and city boundary data provided by HUD in 2006; census block, highway, and stream data obtained from the 2004 ESRI data set

Exhibit 10

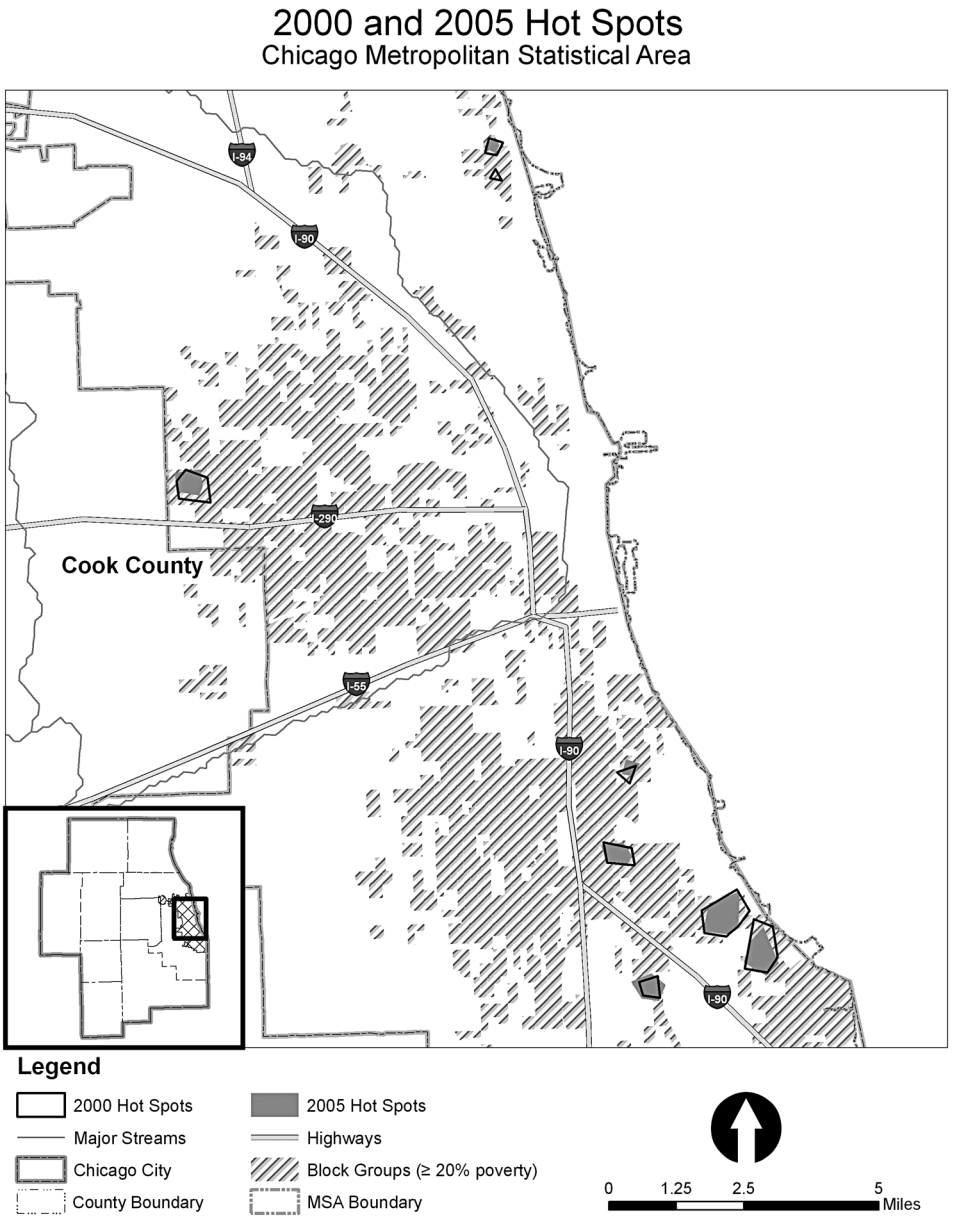
Hot Spots in Houston



Sources: Metropolitan and city boundary data provided by HUD in 2006; census block, highway, and stream data obtained from the 2004 ESRI data set

Exhibit 11

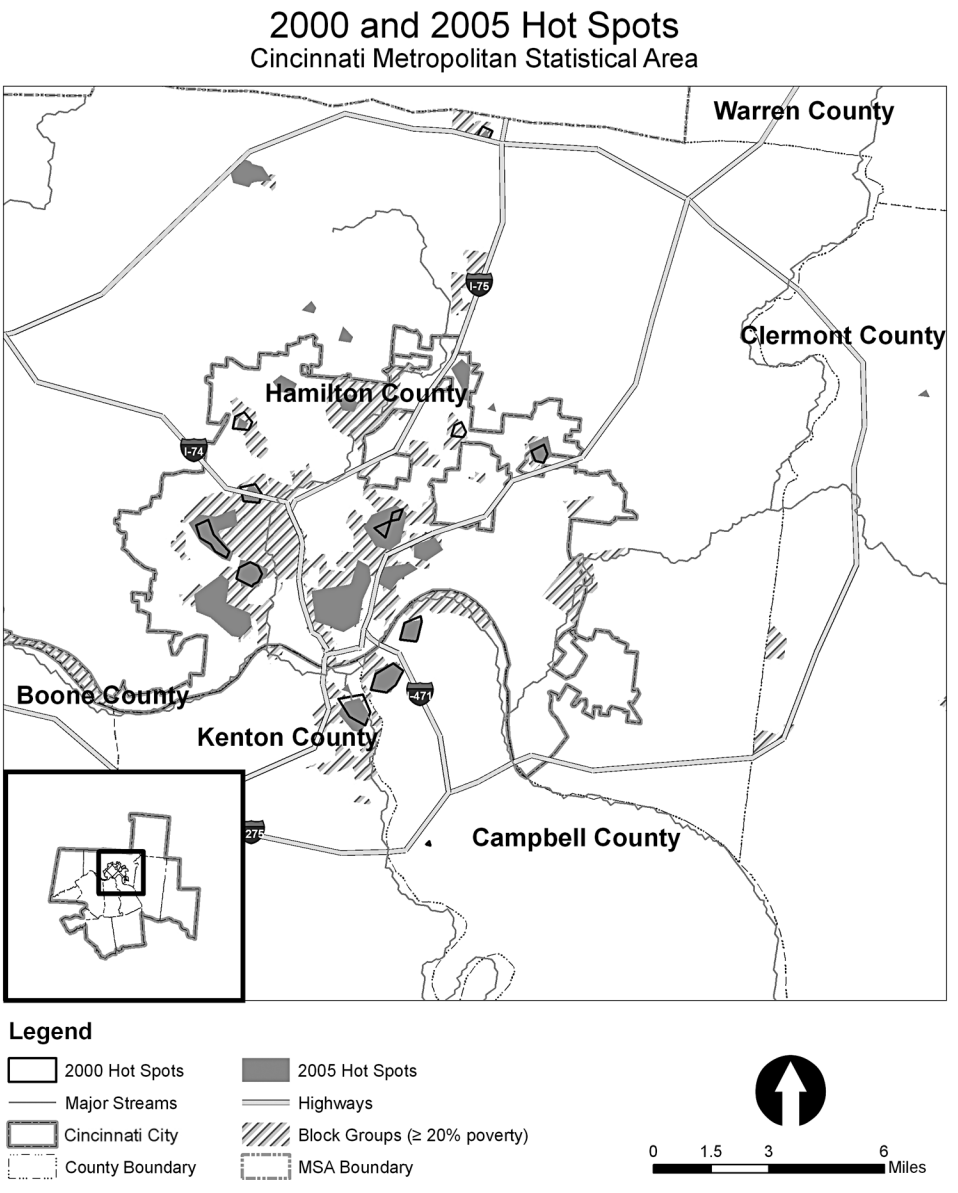
Hot Spots in Chicago



Sources: Metropolitan and city boundary data provided by HUD in 2006; census block, highway, and stream data obtained from the 2004 ESRI data set

Exhibit 12

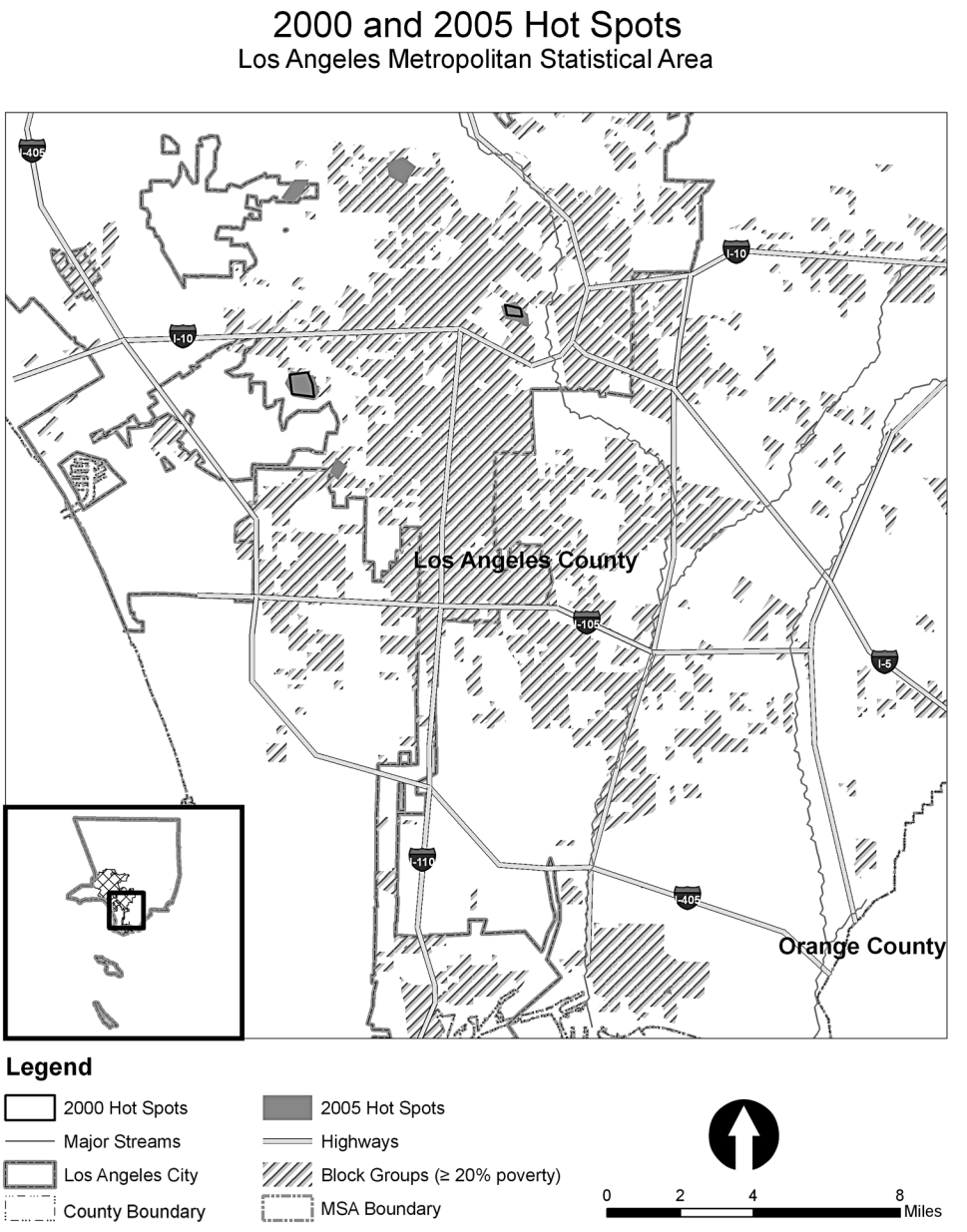
Hot Spots in Cincinnati



Sources: Metropolitan and city boundary data provided by HUD in 2006; census block, highway, and stream data obtained from the 2004 ESRI data set

Exhibit 13

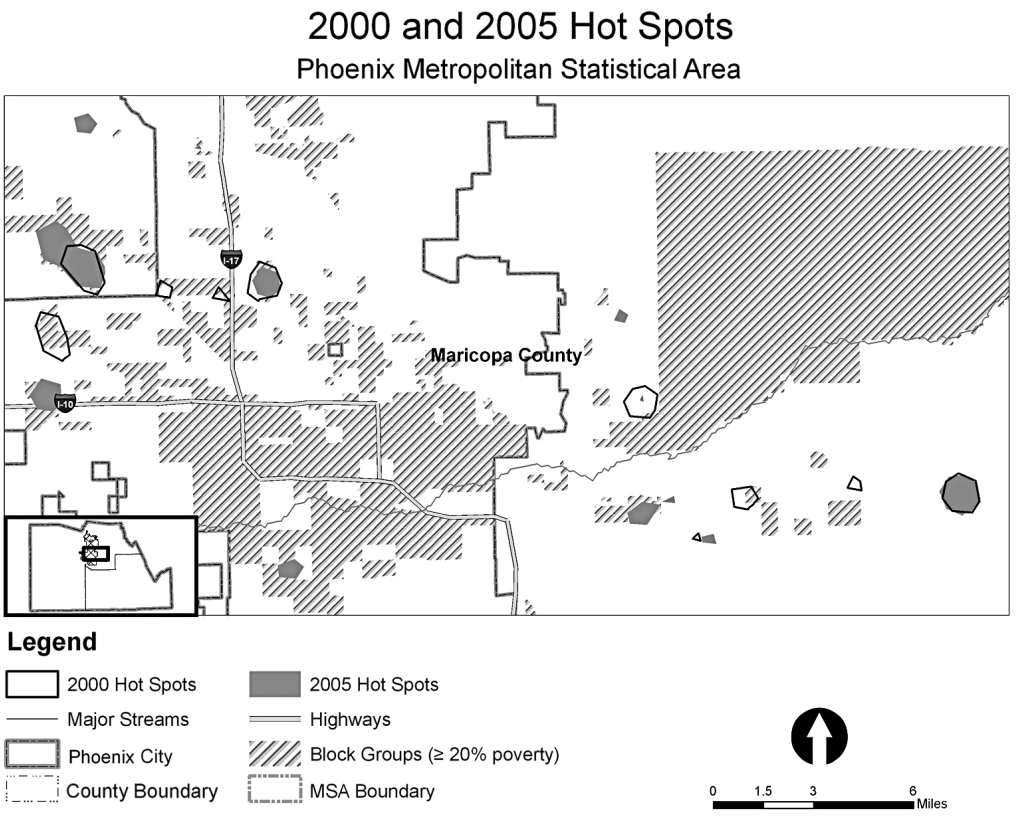
Hot Spots in Los Angeles



Sources: Metropolitan and city boundary data provided by HUD in 2006; census block, highway, and stream data obtained from the 2004 ESRI data set

Exhibit 14

Hot Spots in Phoenix



Sources: Metropolitan and city boundary data provided by HUD in 2006; census block, highway, and stream data obtained from the 2004 ESRI data set

Baltimore also experienced large increases in the number of hot spots and the area covered by them. In 2000, the Baltimore metropolitan area contained only two small hot spots, both outside the city of Baltimore in Baltimore County, one to the west and one to the east of the city. Between 2000 and 2005, the size of hot spots in Baltimore rose from 0.3 to 2.7 square miles. Most new hot spots were in the city of Baltimore, particularly in sections of east, west, and southwest Baltimore. By 2005, the city had eight hot spots and the county had five. Baltimore's hot spots are in neighborhoods populated heavily by African Americans and low-income households.

Topography appears to play a role in accounting for variations in the number of hot spots in the two midwestern metropolitan areas. Cincinnati is a hilly city, which results in relatively well-defined communities and that, in turn, leads to spatially concentrated HCVP populations and many hot spots (44 in the metropolitan area in 2005, up from 15 in 2000). The Cincinnati metropolitan area's hot spots are mostly in the northern sector of Hamilton County, and most of those are within the city limits. Three older Kentucky cities across the Ohio River from Cincinnati (Covington,

Exhibit 15

HCVP Households in Hot Spots

Metropolitan Area	Year	Total HCVP Households	HCVP Households (Number)	Within Hot Spots (Percent)
New York	2000	59,645	5,475	9
	2005	126,355	51,297	41
Baltimore	2000	9,915	470	5
	2005	20,979	3,300	16
Miami	2000	12,547	1,686	13
	2005	20,758	3,660	18
Houston	2000	9,341	1,632	17
	2005	15,785	3,715	24
Chicago	2000	39,770	3,304	8
	2005	54,078	2,639	5
Cincinnati	2000	8,639	1,623	19
	2005	14,892	5,517	37
Los Angeles	2000	51,276	1,483	3
	2005	75,648	4,429	6
Phoenix	2000	8,602	1,132	13
	2005	11,628	1,132	10

HCVP = Housing Choice Voucher Program.

Sources: 2000 Census block boundary data from 2004 ESRI data set; 2000 Census and HCVP data provided by HUD in 2006

Newport, and Dayton) have hot spots. Three-fourths of the growth of Cincinnati's hot spots over the 5 years took place in the city of Cincinnati, with the biggest change being the emergence of new hot spots to the northeast and northwest of downtown. The area northeast of downtown is located in Cincinnati's African-American ghetto; the one that is northwest of downtown and on the western side of the industrial Mill Creek Valley is in a racially changing area containing garden apartments built in the 1950s, 1960s, and 1970s.

In contrast, Chicago has few hot spots, and the hot spot distribution remained relatively stable between 2000 and 2005. The small number of hot spots may reflect the fact that HCVP density is uniformly high in large swaths of the West Side and South Side, where many HCVP recipients live. This uniformity would depress the number of hot spots. In 2005, five of the seven Chicago hot spots were located on the South Side, one on the western edge of the city, and another to the north of downtown. Chicago's hot spots are in more heavily African-American and higher poverty areas.

In both southern metropolitan areas—Miami and Houston—the size of the hot spots increased between 2000 and 2005; however, the total area encompassed by the hot spots was far larger in Houston than in Miami. In 2000, a major Miami hot spot was located to the west of Interstate 95 (I-95), but many small hot spots also were dispersed throughout Dade County. Although many areas identified as hot spots in 2000 remained as hot spots in 2005, several new hot spots emerged

to the west of the city along U.S. Highway 27. Almost all hot spots were in areas with high proportions of Hispanic and low-income households.

Houston's hot spots were spread throughout the city, but a few were located in the suburbs as well. In general, the hot spots were concentrated in heavily African-American and high-poverty areas. Between 2000 and 2005, a new hot spot developed near downtown Houston, and the hot spot in the south loop expanded. Although more than two-thirds (69 percent) of Houston's hot spots were located outside the central city, only about two-fifths (44 percent) of Miami's were.

In 2000, Los Angeles' hot spots were concentrated in south and central Los Angeles. A few more hot spots appeared over the next 5 years, but, with one exception, all were located inside these same two districts. In general, the hot spots in Los Angeles were located in areas with high proportions of African-American and low-income households. The one new hot spot that emerged between 2000 and 2005 was located south of I-405 in a heavily Hispanic area.

In 2005, nearly nine-tenths (86 percent) of the hot spots in the Los Angeles metropolitan area were concentrated in the city of Los Angeles, while only about one-fourth (27 percent) of the hot spots in Phoenix were inside the central city. Other hot spots in the Phoenix metropolitan area were in the eastern suburban cities (Tempe, Scottsdale, and Mesa) and to the west of Phoenix.

Changing Hot Spots

For each metropolitan area, we classified census block groups into one of four categories: (1) ongoing hot spot areas—that is, contiguous census block groups that fully or partially enclosed a hot spot in both 2000 and 2005; (2) disappearing hot spot areas—that is, contiguous census block groups that fully or partially enclosed a hot spot in 2000 but not in 2005; (3) emerging hot spot areas—that is, contiguous census block groups that fully or partially enclosed a hot spot in 2005 only; and (4) non-hot spot areas—that is, the collection of census block groups that did not fully or partially include a hot spot in either 2000 or 2005. For purposes of simplicity, we use the term "ongoing hot spots" rather than "ongoing hot spot census block groups" (and so forth).

Exhibit 16 shows by metropolitan area the breakdown of census block groups between hot spot and non-hot spot areas. In Los Angeles and Chicago, only about 1 percent of the census block groups enclosed hot spots. In contrast, in New York and Cincinnati, more than 10 percent of the census block groups contained or touched hot spots. In the other four metropolitan areas, between 6 and 8 percent of the census block groups contained or touched hot spots.

Exhibit 17 shows the breakdown of the hot spots by category. As shown, no consistent pattern among the metropolitan areas is evident. Baltimore differed from the other metropolitan areas because virtually all (93 percent) of the hot spots were emerging ones. New York, Cincinnati, and Los Angeles had a high, but not overwhelming, proportion of emerging hot spots, but those locations also had a meaningful proportion (about one-quarter) of ongoing hot spots. In Miami and Houston, the number of hot spots was split equally between emerging and ongoing hot spots. In Phoenix, the hot spots were roughly evenly distributed among all three categories (ongoing, disappearing, and emerging). In Chicago, most (73 percent) hot spots were ongoing ones.

Exhibit 16

Proportion of Hot Spot Census Block Groups

Metropolitan Area	Census Block Groups				
	Total	Non-Hot Spots		Hot Spots	
	(number)	(number)	(percent)	(number)	(percent)
New York	9,103	8,036	88.3	1,067	11.7
Baltimore	1,893	1,775	93.8	118	6.2
Miami	1,221	1,117	91.5	104	8.5
Houston	2,331	2,192	94.0	139	6.0
Chicago	5,970	5,893	98.7	77	1.3
Cincinnati	1,291	1,093	84.7	198	15.3
Los Angeles	6,395	6,336	99.1	59	0.9
Phoenix	2,229	2,099	94.2	130	5.8

Sources: 2000 Census block boundary data from 2004 ESRI data set; 2000 Census and Housing Choice Voucher Program data provided by HUD in 2006

Exhibit 17

Three Categories of Hot Spot Census Block Groups

Metropolitan Area	Hot Spot Census Block Groups					
	Ongoing		Disappearing		Emerging	
	(number)	(percent)	(number)	(percent)	(number)	(percent)
New York	232	22	0	0	835	78
Baltimore	3	3	5	4	110	93
Miami	53	51	8	8	43	41
Houston	55	40	15	11	69	50
Chicago	56	73	14	18	7	9
Cincinnati	54	27	10	5	134	68
Los Angeles	14	24	0	0	45	76
Phoenix	40	31	40	31	50	38

Sources: 2000 Census block boundary data from 2004 ESRI data set; 2000 Census and Housing Choice Voucher Program data provided by HUD in 2006

If the HCVP successfully promoted poverty and minority deconcentration,[10] we would expect to see two results: (1) compared to ongoing hot spots, disappearing hot spots would tend to be in high-poverty and high-minority areas; and (2) compared to ongoing hot spots, emerging hot spots would tend to be in low-poverty and low-minority areas.

Exhibit 18 shows the socioeconomic indicators for the metropolitan areas' hot spots and non-hot spots. In Miami, the proportion of low-income households in disappearing hot spots meets expectations—they are far higher than in ongoing ones (33 and 24 percent, respectively). The results in

[10] We emphasize again that poverty deconcentration is not the main goal of the Housing Choice Voucher Program.

Exhibit 18

Socioeconomic Indicators for the Non-Hot Spot and Three Categories of Hot Spot Census Block Groups

Metropolitan Area	Ongoing Hot Spots (%)	Disappearing Hot Spots (%)	Emerging Hot Spots (%)	Non-Hot Spots (%)
Percentage of Households in Poverty[a]				
New York	39	NA	31	12
Baltimore	19	22	20	8
Miami	24	33	23	14
Houston	33	27	38	1
Chicago	65	32	14	10
Cincinnati	25	14	23	7
Los Angeles	34	NA	28	15
Phoenix	16	18	15	9
Percentage of African Americans				
New York	33	NA	36	19
Baltimore	71	42	61	25
Miami	12	30	9	21
Houston	50	25	44	16
Chicago	87	70	77	18
Cincinnati	48	27	44	8
Los Angeles	62	NA	18	10
Phoenix	6	6	5	4
Percentage of Hispanics				
New York	59	NA	45	17
Baltimore	2	3	3	2
Miami	76	60	79	55
Houston	32	56	28	30
Chicago	3	8	4	17
Cincinnati	1	2	2	1
Los Angeles	24	NA	32	45
Phoenix	32	40	37	24

NA = not available.

[a] We used the 2000 Census definition that identified households below the poverty level.

Sources: 2000 Census block boundary data drawn from the 2004 ESRI data set; 2000 Census and Housing Choice Voucher Program data provided by HUD in 2006

Chicago are mixed. As expected, the proportion of HCVP households in poverty is lower in emerging than in ongoing hot spots (14 percent versus 65 percent). In contrast to expectations, however, the percentage of HCVP households in poverty areas is also lower in disappearing hot spot areas (32 percent) than in ongoing hot spots (65 percent). In Houston, emerging hot spots had higher proportions of households below the poverty level than did ongoing hot spots.

The results dealing with race and ethnicity were similarly inconclusive. As expected, Miami's disappearing hot spots had higher proportions of African Americans than ongoing or emerging hot spots

did. At the same time, Miami's disappearing hot spots had relatively low proportions of Hispanics. Houston exhibited the opposite pattern. There, disappearing hot spots had higher proportions of Hispanics, but low proportions of African Americans. In Los Angeles, the results are consistent with the deconcentration hypothesis; that is, the proportion of African Americans in emerging hot spot areas was much lower than in ongoing ones (18 percent versus 62 percent). The Los Angeles pattern was not evident in any of the other metropolitan areas.

Conclusions

Using hot spot analysis, this article has sought to expand the limited literature available on the spatial distribution of households participating in HUD's HCVP. To perform this hot spot analysis, we created two HCVP-recipient density raster grids for eight metropolitan areas, two in each region of the United States. We defined HCVP hot spots for each metropolitan area as the aggregation of grid cells with an HCVP density greater than half of the highest 2000 HCVP density in the metropolitan area.

In general, the results should dampen expectations concerning the potential effect of the HCVP on poverty deconcentration. First, minimal evidence suggested that HCVP was shifting to the suburbs. Although the proportions of HCVP recipients living in the central city decreased between 2000 and 2005 in Phoenix, Houston, and Chicago, they increased in the other five metropolitan areas.

Second, little indicated that the HCVP was promoting poverty or minority deconcentration. The proportion of HCVP households in high-poverty and high-minority (African-American or Hispanic) census block groups remained stable during the 2000-to-2005 period. Furthermore, there was no support for our hypothesis that disappearing hot spots would have relatively high-poverty and minority-population rates while rates in emerging hot spots would be relatively low.

Third, no evidence emerged to show a decline in HCVP clustering. Although HCVP recipients were becoming less concentrated in hot spots in Chicago and Phoenix, the opposite was true in the other metropolitan areas, especially in New York, Cincinnati, and Baltimore.

Fourth, the results also failed to show that the hotter the housing market, the greater the degree of concentration of HCVP households in hot spots. The concentration of HCVP recipient hot spots in the hottest housing market, New York, was comparable to the degree of concentration in the coolest housing market, Cincinnati. Both levels of concentration far exceeded that in Chicago, another hot-market area.

Finally, the results show that growth in the HCVP between 2000 and 2005 has affected clustering patterns in different metropolitan areas in different ways. In New York and Cincinnati, the growth of the HCVP population has led to a large increase in the number of hot spots, the density in these hot spots and the areas they encompass, and the characteristics of the population living in the hot spots. In contrast, Chicago and Los Angeles continue to have few hot spots that cover only relatively small areas.

The fact that many HCVP households live in central cities and that HCVP clustering continues should not be surprising. HCVP housing opportunities are limited to available affordable housing; that is, to properties renting below Fair Market Rent or at the somewhat higher payment standard. If

these units are concentrated in particular areas, housing agencies can do little to move households to other areas. Other factors, such as proximity to friends, churches, and public transportation, also contribute to the continued concentration of poverty and to the continued concentration of HCVP households. Unless the distribution of affordable housing opportunities changes, the clustering of HCVP clients and their concentration in high-poverty, high-minority areas will continue.

Implications for HCVP Hot Spot Research

We caution against comparing the number of hot spots in one metropolitan area with those in another metropolitan area. A metropolitan statistical area (MSA) with high HCVP densities may not have many hot spots if the HCVP households are evenly distributed within large districts such as Chicago's South Side and West Side. On the other hand, an MSA with much lower HCVP densities may contain a large number of hot spots if HCVP households are confined to relatively clearly defined communities based on topography or housing patterns (for example, Cincinnati). The most appropriate use of hot spot analysis is for examining changes in the location of hot spots for particular metropolitan areas over time. For example, are more of them emerging outside the central city?

Furthermore, hot spot results are sensitive to density distribution and, in particular, to extremely high densities. In Baltimore, Chicago, and Los Angeles, the highest densities were 25 to 32 times as high as the mean densities; the ratios in the other five metropolitan areas were between 12 and 20 times as high as the mean densities. Consequently, fewer hot spots were identified in the three high-density metropolitan areas.

The number of hot spots should not be confused with the number of HCVP households in the metropolitan area. The latter affects the density value for the whole metropolitan area, not the spatial distribution within the metropolitan area. For example, some hot spots may be so close to each other that they merge into a bigger hot spot. In other metropolitan areas, hot spots may be very distant from each other. The policy implications of these two patterns are quite different.

Hot spot results are very much affected by the threshold value chosen. In our study, we used the value that was half of the highest 2000 HCVP density for that particular metropolitan area. Other methods may be used to define the threshold value, such as using three standard deviations above the mean density. Density is calculated from the number of HCVP households in the area's vicinity. Clearly, hot spot analysis is as much an art as it is a science.

Our experience demonstrates that it is more important to use the hot spot method to focus attention on certain areas rather than highlight the actual hot spot boundaries. Some hot spots effectively identify the areas of HCVP household concentration. In other cases, however, the actual boundary may not appear reasonable because, for example, it may cut through an apartment complex rather than include the entire development. It is important to recognize that density is calculated for each cell and that the resulting density statistic is a function of the number of HCVP recipients in the vicinity of the cell. Take, for example, a high HCVP density apartment complex with a scattering of HCVP households in the vicinity of the complex. The dispersal pattern of HCVP households outside the apartment complex could affect the actual shape of the hot spot.

Hot spot analysis is most likely to be useful as a research and planning tool if it is combined with field observation The latter could help in identifying different types of hot spots (for example, 1950s and 1960s garden apartment complexes, newer low-income housing tax credit developments, or single-family detached home neighborhoods containing houses for rent). Field observation is a necessary prerequisite for developing programs that address the unique clustering-related issues pertinent to these different types of neighborhoods.

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Use of Flat Rents in the Public Housing Program

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Abstract

The 1998 Quality Housing Work Responsibility Act (QHWRA) requires public housing agencies (PHAs) to offer the option of a flat rent (as opposed to an income-based rent) to residents of public housing. Flat rents are based on market rents and, therefore, the tenant rent does not vary with income. The U.S. Department of Housing and Urban Development (HUD) expected that by having the option of paying a flat rent, public housing residents would not be discouraged from working and increasing their income because their rent would not increase if their income increased. Similarly, QHWRA's flat-rent option was also expected to avoid creating disincentives for continued residency by families that are attempting to become economically self-sufficient.

HUD implemented the provision on flat rents in 1999. As of the end of 2005, about 105,000 families (of the more than 1.2 million public housing households) were identified on HUD's data system as paying either flat rents or ceiling rents.

This article uses extracts from HUD's Office of Public and Indian Housing Information Center data system to provide some basic information on the use of flat rents in public housing, including the types of PHAs, places, and families that have selected a flat rent, and changes that have taken place in these properties and for these families coincident with the use of flat rents.

The article shows that, although nearly all PHAs have at least some flat-rent units, the proportion of flat-rent units in each PHA is generally small. Households paying flat rents have much higher incomes compared with other public housing residents. Similarly, a much higher percentage of households paying flat rents reported that most of their income was from wages compared with other public housing households. Thus, flat rents appear to be succeeding in allowing residents in these units to increase their income through employment and to remain in their units even as their income increases. Rents in units where residents are paying flat rents are substantially higher than in other public housing units. At the same time, households paying flat rents are virtually always paying less than 30 percent of their income for rent. In other words, flat rents

Abstract (continued)

offer benefits to both the residents and the housing agencies. Residents pay less than they would under an income-based rent scenario and the PHAs receive a higher rent than they would from regular public housing tenants. Properties with flat-rent units have a higher degree of income mixing than other properties do. This finding is as expected because households in units with flat rents have higher incomes than most other public housing households do.

Background

The 1998 Quality Housing Work Responsibility Act (QHWRA) required public housing agencies (PHAs) to offer the option of a flat rent (as opposed to an income-based rent) to residents of public housing. Flat rents are based on market rents and, therefore, the tenant rent does not vary with income. By having this option, the U.S. Department of Housing and Urban Development (HUD) expected that public housing residents would not be discouraged from working and increasing their income because their rent would not increase if their income increased. Similarly, QHWRA's flat-rent option was also expected to enable working families, as they become more self-sufficient, to continue to live in public housing, thereby providing possible positive role models to other public housing residents.

Before the implementation of QHWRA, HUD had permitted the use of ceiling rents, a provision that allowed PHAs to place a cap on the amount of income-based rent that could be charged for public housing. Ceiling rents were cost based, not market based. HUD's regulations implementing flat rents indicated that PHAs were permitted to retain ceiling rents that were authorized and established before October 1, 1999, for 3 years ending September 30, 2002. After that date, PHAs were allowed to continue to charge ceiling rents, but with several conditions. First, the ceiling rents had to be equal to the flat-rent (and, presumably, market-based) amounts.[1] Second, the ceiling rent had to be offered as an annual choice to families and had to be equal to at least the PHA's minimum rent amount.[2]

According to HUD's Office of Public and Indian Housing Information Center (PIC) data system, as of December 2005, about 105,000 families were identified as paying either flat rents or ceiling rents. More than one-third of these families were residents of units operated by the New York City

[1] The existence of ceiling rents can be very beneficial for families with multiple income changes during the year. Although a family is given the option of selecting a flat rent only once a year, the ceiling rent can go into effect at any time during the year when the family's income changes. For example, if a family's income increases after the family declines the option of selecting a flat rent for that year and the family's income-based rent now exceeds the flat rent it would have paid, the ceiling rent can go into effect immediately and protect the family by capping its rent at the level it would have paid had it selected a flat rent.

[2] Regardless of whether it is a ceiling rent, a flat rent, or an income-based rent, the family must pay at least the minimum rent amount as determined in the public housing agency's Admissions and Continued Occupancy Policy.

Housing Authority.[3] Besides these aggregate statistics, however, very little was known about the type of households and PHAs that have used flat rents.

This article uses annual extracts of data from HUD's PIC system to answer some basic questions about the use of flat rents in public housing: What types of PHAs are adopting flat rents in large numbers? What types of households are choosing flat rents? How has household income changed coincident with the use of flat rents? How have turnover and income changed in properties with concentrations of flat rents? The PIC data provide household-level observations on a rich array of programmatic, tenant demographic, and locational variables. Household identification numbers are available so that household information from different years can be linked to study changes over time.

Research Questions and Data Sources

The goal of this article is to describe the following aspects of the use of flat rents in public housing:

- Number and characteristics of PHAs using flat rents.
- Characteristics of households in units with flat rents.
- Changes in the use of flat rents by families during the 2003-through-2005 period.
- Assessments of flat rents relative to local rents and relative to income-based rents.
- Dispersion of flat rents across PHAs and a comparison of tract poverty in census tracts with concentrations of flat rents.
- Changes in wages and turnover in properties with flat rents compared with other properties.
- Income mixing in properties with flat rents compared with other properties.

We used a December 2005 extract from the PIC data system to describe the characteristics of PHAs, households, and locations of flat-rent units at a certain time. From this data file, we extracted the subset of households reported to be using flat rents at that time. We used cross-tabulations to examine the characteristics of those households and their housing agencies.

To describe changes in the use of flat rents over time, we used the annual PIC data system files for 2003 through 2005 and linked them by household identification number for all households that ever paid flat rents.[4]

To compare properties that had clusters of flat-rent residents with other properties, we used all household records on the 2005 PIC system. To document changes in wages and turnover in these so-called "cluster" properties relative to other properties required using a linked longitudinal file for all households in any PHA that had any households with flat rents.

[3] Rental Integrity Monitoring reviews that Abt Associates Inc. conducted for HUD indicate that true market-based flat rents have never been implemented in New York City and that the income-based ceiling rents had not been increased from 1998 through 2006.

[4] Although HUD implemented the provision on flat rents in 1999, all Office of Public and Indian Housing Information Center records for 2000 through 2002 had missing data for the field labeled "flat rent"; thus, the analysis includes only 2003-through-2005 data.

A key challenge in this study was identifying households paying flat rents and households paying ceiling rents among the general public housing population paying income-based rents in the PIC system.[5] Rent information for public housing households is reported on page 8 as line items 10(a) through 10(u) of HUD Form-50058. According to regulations, PHAs are required to offer every household the option of paying a flat rent. PHAs are supposed to report the flat-rent amount for each unit on line item 10(b) regardless of the household's decision to use flat rents or income-based rents. Thus, a household record with a flat-rent amount does not imply that the household has selected to pay a flat rent. By the same token, a household record with a ceiling-rent amount does not imply that the household has selected to pay ceiling rents. Our examination of the 2000-through-2005 PIC system data indicates that, until 2003, item 10(b) is never populated and, from 2003 through 2005, only 11 to 16 percent of the household records include a flat-rent amount. As a result, the work for this analysis is limited to the 2003-through-2005 period. Exhibit 1 shows the prevalence of flat rents and ceiling rents reported in the public housing stock during the 2000-through-2005 period. Line item 10(u) explicitly identifies whether a household is paying a flat rent versus an income-based rent.

Exhibit 1

The Prevalence of Flat-Rent and Ceiling-Rent Amounts Reporting in the Public Housing Stock, 2000–05

	Year					
	2000	**2001**	**2002**	**2003**	**2004**	**2005**
Number of household records reporting neither a flat-rent nor ceiling-rent amount	499,643	516,985	463,605	495,783	571,999	589,220
(Percent)	56	51	54	52	55	53
Number of household records reporting a ceiling-rent amount	398,971	504,573	391,933	351,005	326,255	348,737
(Percent)	44	49	46	37	31	31
Number of household records reporting a flat-rent amount	0	0	0	88,461	115,652	143,925
(Percent)	0	0	0	9	11	13
Number of household records reporting both a flat-rent and ceiling-rent amount	0	0	0	25,590	29,451	33,383
(Percent)	0	0	0	3	3	3
Total	898,614	1,021,558	855,538	960,839	1,043,357	1,115,265
(Percent)	100	100	100	100	100	100

Note: The presence of a household record with a flat-rent or ceiling-rent amount does not imply that the household is being charged the flat (or ceiling) rent.

Source: Office of Public and Indian Housing Information Center system (PIC system)

[5] Originally, HUD intended for agencies to update their flat rents annually to ensure that they remain market based; however, the final regulation is silent on how often the flat rents must be updated. Some agencies may not have recalibrated their flat rents since implementation.

For this analysis, we used an algorithm that HUD developed to identify which households are actually paying flat rents, ceiling rents, or income-based rents. The algorithm, described in appendix A, uses data from lines 10(b) and 10(u) and other data elements from the HUD form.

Exhibit 2 shows the distribution of public housing units by rent type during the 2003-through-2005 period. In 2005, more than 10 percent of the public housing residents were paying either flat rents or ceiling rents. As discussed earlier, beginning October 1, 2002, all PHAs were required to adjust their ceiling rents to the level required for flat rents. In the remainder of this article, we combine these two categories of public housing units and call them flat-rent units.

As indicated earlier, the New York City Housing Authority did not implement market-based flat rents as required by HUD regulations, and it did not increase its income-based ceiling rents during the 1998-to-2006 period. Thus, households in that agency that reported paying ceiling rents are not being charged market-based rents. It is likely other housing agencies may be following the same practice.

It is also worth noting that income information for households paying flat rents may not have been updated in the PIC system during the annual reexamination process. We understand that some agencies did not know that action/transaction code 12 (flat-rent annual update) existed and that they may have used code 2 (annual reexamination) without updating the income information. Conversely, agencies that used transaction code 12 may have updated income information because the agency had to calculate annually the income-based rent before offering the family an informed choice between rent types.

Another methodological challenge for this study was in determining empirically when a property has a cluster of flat-rent residents and when a census tract has a so-called "concentration" of flat-rent units. To make this determination, we first examined the distribution of residents reported to

Exhibit 2

Number of Public Housing Households by Rent Type, 2003–05

	Year		
	2003	**2004**	**2005**
Number of households paying flat rent	37,663	43,774	50,574
(Percent)	4.6	5.3	5.8
Number of households paying ceiling rent	47,189	47,995	48,959
(Percent)	5.8	5.8	5.6
Number of households paying income-based rent	723,316	719,636	766,997
(Percent)	88.3	87.6	87.5
Number of households for which rent type is unknown	10,914	10,075	10,386
(Percent)	1.3	1.2	1.2
Total	819,082	821,480	876,916
(Percent)	100	100	100

Notes: Calculated using HUD's rent determination algorithm. Records with transaction/action type of "end-of-participation" are excluded.

Source: Office of Public and Indian Housing Information Center system (PIC system)

be using flat rents by project, across the PHAs, and at the distribution of percents of public housing units with flat rents by tract. Using these empirical distributions, we determined a set of alternative cutoffs to define concentrations or clusters.

Study Findings

This section presents the findings on aspects of the use of flat rents.

Number and Characteristics of PHAs Using Flat Rents

Exhibit 3 shows the number of PHAs with any flat-rent units and the characteristics of those PHAs compared with PHAs that have no such units. Nearly all PHAs (88.6 percent) have at least some flat-rent units. The following points summarize our findings on the number and characteristics of PHAs using flat rents:

- The distribution of PHAs with flat rents by region is similar to the overall distribution of PHAs.
- Smaller PHAs, however, are less likely to have flat-rent units than are larger PHAs.
- High-performing PHAs, based on Public Housing Assessment System[6] scores, are more likely to have flat-rent units than are lower-performing PHAs.

Although most PHAs have some flat-rent units, the proportion of flat-rent units is generally small. Flat-rent units account for less than one-quarter of all PHA units in more than 80 percent of PHAs with flat-rent units (including 45.5 percent of PHAs with fewer than 10 percent of units). (See exhibit 4 for details.)

Overall, flat rents are paid for 99,533, or 11.5 percent, of all public housing units. Exhibit 5 presents information on the units with flat rents compared with other public housing units. The exhibit shows the following results:

- The New York/New Jersey region accounts for only 21 percent of all public housing units but for more than one-third (37 percent) of all flat-rent units. (Most flat-rent units in this region are in New York City, which, with 32,179 flat-rent units, accounted for about one-third of all flat-rent units nationwide). In contrast, the Southeast/Caribbean region accounts for 29 percent of all public housing units but only 23 percent of flat-rent units.
- More than one-third of flat-rent units nationwide are in PHAs with more than 6,500 units (again, this number is mostly driven by New York City's 32,179 flat-rent units).
- Similarly, 65 percent of the flat-rent units nationwide are in high-performing PHAs (again, this number is driven by New York City's high-performer status).

[6] HUD's Public Housing Assessment System categorizes the overall performance of each of the nation's public housing agencies (PHAs) by integrating assessments from four aspects of performance: (1) financial condition, (2) physical condition, (3) management, and (4) resident satisfaction. PHAs are categorized as high performers, standard performers, substandard performers, or troubled performers based on a combination of the scores from the four aspects of performance.

Exhibit 3

Characteristics of PHAs With Any Flat-Rent Units and PHAs That Have No Flat-Rent Units

	PHA Has Flat-Rent Units	PHA Has No Flat-Rent Units	All PHAs
Number of PHAs	2,782	322	3,140
Percent of total PHAs	88.6	10.3	100
		(percent)	
PHA location: HUD region			
New England	4.7	10.9	5.3
New York/New Jersey	5.3	5.3	5.3
Mid-Atlantic	5.8	3.1	5.6
Southeast/Caribbean	26.2	19.6	25.5
Midwest	16.9	17.5	17.0
Southwest	21.9	24.6	22.2
Great Plains	11.7	5.9	11.1
Rocky Mountain	3.4	7.2	3.8
Pacific	2.5	2.8	2.5
Northwest	1.6	3.1	1.7
Total	100.0	100.0	100.0
PHA size category (units)			
1 to 249	72.4	92.5	74.5
250 to 499	14.8	6.2	13.9
500 to 1,249	8.2	1.3	7.5
1,250 to 6,599	4.1	0.0	3.7
6,600 or more	0.4	0.0	0.4
Total	100.0	100.0	100.0
PHA performance (PHAS) category			
High performer	48.4	37.3	47.2
Standard performer	43.7	49.2	44.2
Substandard—financial	4.1	6.3	4.3
Substandard—management	0.1	0.0	0.1
Substandard—physical	1.8	3.1	2.0
Troubled performer	2.0	4.1	2.2
Total	100.0	100.0	100.0
Average PHAS score	86.9	84.0	86.6

PHA = public housing agency. PHAS = Public Housing Assessment System.

Sources: Office of Public and Indian Housing Information Center system (PIC system); PHAS scores

Exhibit 4

Distribution of PHAs With Flat-Rent Units, by Proportion of Flat-Rent Units—2005

Percent of Flat-Rent Units Among All PHA Units	Number of PHAs	Percent of PHAs
0 to 10	1,267	45.5
11 to 25	1,009	36.3
26 to 50	441	15.9
51 to 75	53	1.9
76 or more	12	0.4
Total	**2,782**	**100.0**

PHA = public housing agency.

Source: Office of Public and Indian Housing Information Center system (PIC system)

Exhibit 5

Characteristics of Units With Flat Rents and Other Public Housing Units—2005

	Flat-Rent Units	Other Public Housing Units	All Public Housing Units
Number of housing units	99,533	766,977	866,510
Percent of all units	11.5	88.5	100
		(percent)	
PHA location: HUD region			
New England	3	7	7
New York/New Jersey	37	19	21
Mid-Atlantic	7	9	9
Southeast/Caribbean	23	30	29
Midwest	11	14	14
Southwest	10	10	10
Great Plains	4	4	4
Rocky Mountain	1	2	2
Pacific	4	5	5
Northwest	0	1	1
Total	100	100	100
PHA size category (units)			
1 to 249	23	20	20
250 to 499	13	15	15
500 to 1,249	14	17	17
1,250 to 6,599	15	25	24
6,600 or more	35	23	25
Total	100	100	100
PHA performance (PHAS) category			
High performer	65	47	49
Standard performer	31	46	45
Substandard—financial	2	3	3
Substandard—management	0	0	0
Substandard—physical	2	2	2
Troubled performer	1	2	2
Total	100	100	100

PHA = public housing agency. PHAS = Public Housing Assessment System.

Source: Office of Public and Indian Housing Information Center system (PIC system)

Characteristics of Households in Units With Flat Rents

Exhibit 6 presents the characteristics of households in units with flat rents. The following list summarizes the characteristics:

- Households paying flat rents are less likely to include a resident who is disabled compared with households in other public housing units. (Only 12 percent of households in flat-rent units reported a head of household who was disabled compared with 22 percent of households in other public housing units.)

Exhibit 6

Characteristics of Households in Units Paying Flat Rents and Other Public Housing Units—2005 Data

	Flat-Rent Units	Other Public Housing Units	All Public Housing Units
Number of housing units	99,553	766,977	866,510
Percent of all units	11.5	88.5	100
Age of household head (average)	51.3	50.5	50.6
		(percent)	
Disability status of household head			
Yes	12	22	21
No	88	78	79
Total	100	100	100
Race/ethnicity of household head			
Non-Hispanic White	32	33	33
Non-Hispanic African American	46	43	44
Hispanic	19	21	21
Other	2	3	3
Total	100	100	100
Presence of children in household			
Yes	39	41	41
No	61	59	59
Total	100	100	100
Total household income (average)	$28,150	$9,426	$11,659
Household income as percent of area median	52	17	21
Source of income			
Most of income from wages			
Yes	68	25	30
No	32	75	70
Total	100	100	100
Most of income from welfare			
Yes	1	12	11
No	99	88	89
Total	100	100	100

Source: Office of Public and Indian Housing Information Center system (PIC system)

- The racial composition and average age were similar in flat-rent units and other public housing units, as was the probability of having children in the unit.
- Consistent with the goals of flat rents to promote employment and increased income, substantial differences were evident between the incomes of households paying flat rents and the incomes of other public housing households. Households paying flat rents had, on average, much higher incomes in absolute dollars (an average of $28,150 per household compared with $9,426 in other units) and relative to the local area median (an average of 52 percent of area median compared with 17 percent in other units).
- Residents paying flat rents were more likely to receive most of their income from employment compared with residents of other public housing. Of the households paying flat rent, 68 percent reported that most of their income was from wages compared with only 25 percent of residents in other public housing, and only 1 percent of households had most of their income from welfare compared with 12 percent of other public housing households.[7, 8]

Changes in the Use of Flat Rents by Families During the 2003-Through-2005 Period

To estimate changes in the use of flat rents, we identified households paying flat rents in 2003 and then tracked the rent type and income information of these households in 2004 and 2005. As described in the Research Questions and Data Sources section, we could do this for only the 2003-through-2005 period.

Exhibits 7a through 7c show that households often move in and out of paying flat rents. The following list summarizes the information in the three exhibits.

- About 60 percent of households paying flat rents in 2003 continued to do so in 2004, and fewer than half (47.5 percent) were still paying flat rents in 2005.
- About 13 percent of households paying flat rents in 2003 were paying other (typically income-based) rents in 2004, as were 14.5 percent in 2005.
- Most households that were no longer paying flat rents in 2005 had left the program.[9]
- Apparently, the main reason households switch from flat rents to nonflat rents is because their income decreases. Exhibit 7b shows that 78 percent of households that moved from flat rents to other rents experienced a decrease in income, although about 20 percent experienced an increase.

[7] We excluded 4.6 percent of the household records in which the total household income is zero or greater than $90,000 because these levels of income most likely result from coding and reporting errors in the Office of Public and Indian Housing Information Center system.

[8] The higher incomes of households paying flat rents are influenced by the fact that a large percentage of these units are in New York City. Incomes and rents tend to be higher in New York City than in other places. As shown in appendix B, however, incomes of households paying flat rents outside New York City are also substantially higher than incomes of other public housing residents.

[9] Program exit rates are similar for households paying flat rents and households in other public housing. Of households paying other rents in 2003, 14.5 percent ended participation by 2004 and 15.3 percent had an unrecorded exit. Of households paying other rents in 2003, 16.8 percent ended participation by 2005 and 21.8 percent had an unrecorded exit. For comparison, as shown in exhibits 7a through 7c, of households paying flat rents in 2003, 13.4 percent ended participation by 2004 and 13.8 percent had an unrecorded exit. Of households paying flat rents in 2003, 15.3 percent ended participation by 2005 and 22.8 percent had an unrecorded exit.

- In comparison, most households that continued to pay flat rents experienced an increase in income over time. For example, as shown in exhibit 7c, nearly 58 percent of the households that paid flat rents in 2003 and 2004 had an increase in income in 2004. More than 70 percent of households that were still paying flat rents in 2005 experienced an increase in income relative to 2003. This increase in income may indicate that flat rents appear to be accomplishing their legislative intent of enabling higher income residents to remain in public housing as their income increases.

Exhibit 7a

2004 Status and 2005 Status of 84,852 Households Paying Flat Rents in 2003

	2004 Status		2005 Status	
	Number of Units	Percent	Number of Units	Percent
Paying flat rent	50,506	59.5	40,279	47.5
Paying other rent	11,186	13.2	12,307	14.5
Paying unknown rent type	131	0.2	403	0.5
End of participation	11,365	13.4	13,005	15.3
Unrecorded program exit[a]	11,664	13.8	18,858	22.2
Total	84,852	100.0	84,852	100.0

[a] Households were classified as "unrecorded program exits" if they were in the Office of Public and Indian Housing Information Center file in 2003 but not in the later years and if they were not identified as having ended participation.

Source: Office of Public and Indian Housing Information Center system (PIC system)

Exhibit 7b

Change in Household Income for Households Paying Flat Rents in 2003 and Switching to Other Rents in 2004 and 2005

	From 2003 to 2004		From 2003 to 2005	
	Number of Units	Percent	Number of Units	Percent
Increase	2,040	19.1	2,582	21.8
Equal	319	3.0	69	0.6
Decrease	8,328	77.9	9,172	77.6
Total	10,687[a]	100.0	11,823[b]	100.0

[a] Income information is missing, out of range, or zero for 499 of the 11,186 households that paid other rents in 2004.

[b] Income information is missing, out of range, or zero for 484 of the 12,307 households that paid other rents in 2005.

Source: Office of Public and Indian Housing Information Center system (PIC system)

Exhibit 7c

Change in Household Income for Households Paying Flat Rents in 2003 and Staying With Flat Rents in 2004 and 2005

	From 2003 to 2004		From 2003 to 2005	
	Number of Units	Percent	Number of Units	Percent
Increase	28,974	57.7	27,954	70.4
Equal	11,077	22.1	3,991	10.0
Decrease	10,124	20.2	7,779	19.6
Total	50,175[a]	100.0	39,724[b]	100.0

[a] Income information is missing, out of range or zero for 331 of the 50,506 households that paid flat rents in 2004.

[b] Income information is missing, out of range, or zero for 555 of the 40,279 households that paid flat rents in 2005.

Source: Office of Public and Indian Housing Information Center system (PIC system)

Assessment of Flat Rents Relative to Local Rents and Relative to Income-Based Rents

Exhibit 8 compares rents in flat-rent units and other public housing units with prevailing local market rents (as proxied by local Fair Market Rents [FMRs])[10] and with income-based rents (defined as 30 percent of income). We would expect rents in flat-rent units to be similar to market rents because they are based on market rents and to be higher than rents in other public housing units because, presumably, market rents are higher than the income-based rents that public housing residents generally pay.

The following list summarizes the information in exhibit 8:

- Consistent with the expectation that market rents are higher than income-based rents, rents in units where residents were paying flat rents, averaging $413 per month, were substantially higher than rents in other public housing units, which averaged $200 per month.[11]
- Although we expected rents in units with flat rents to be close to market-rent levels, in fact, rents in both units with flat rents and other rents were well below comparable market levels (as proxied by the local FMR). More than half (51 percent) the units with flat rents had rents below 50 percent of the FMR, as did 88 percent of other units. (The fact that flat rents are generally below the local FMR implies that the FMR is not a good proxy for market rents for public housing units. Although the FMR is a metropolitan statistical area-wide or nonmetropolitan countywide measure of rents across the jurisdiction, many public housing units are located in the low-rent portions of the jurisdiction).
- Households paying flat rents were virtually always paying less than 30 percent of their income for rent, as shown by the ratio of the flat rent to income-based rent, which is below 1 for 99 percent of flat-rent units. Most (62 percent) were paying less than 75 percent of the comparable income-based rent. As expected, households in other public housing units typically paid the income-based rent, defined as 30 percent of income.[12]

[10] HUD establishes Fair Market Rents (FMRs) for metropolitan areas or nonmetropolitan counties in the country. FMRs represent HUD's estimates of the 40th (or, in some cases, the 50th) percentile of recently rented nonluxury apartments in an area. FMRs are used to determine the amount of the federal subsidy for participants in the tenant-based Section 8 program.

[11] As shown in appendix B, rents in units where residents were paying flat rents were substantially higher than in other public housing units, both in New York City (average flat rent $510) and in other locations (average flat rent $366).

[12] About 7 percent of households paying "other rents" paid more than 30 percent of income. According to HUD regulations (24 CFR 960.253), public housing tenants must pay at least the minimum rent amount as determined in the public housing agency's Admissions and Continued Occupancy Policy. For these households, it is most likely that the minimum rent amount is greater than 30 percent of income. The requirement to pay a minimum rent may explain a portion of the cases with rents above 30 percent of income. Minimum rent, however, is capped at $50, and the average rent and adjusted annual income for "other rent" households paying more than 30 percent of income for rent are $403 and $7,979, respectively. Thus, it is likely that, at least in part, this finding reflects errors in the data.

Exhibit 8

Rents in Units With Flat-Rent Units and Other Public Housing Units

	Flat-Rent Units	Other Public Housing Units	All Public Housing Units
Number of housing units	99,553	766,977	866,510
		(dollars)	
Rent level charged			
Mean	413	200	224
Median	416	174	185
Standard deviation	159	137	155
Percentile statistic			
10th percentile	225	50	50
25th percentile	296	116	133
75th percentile	495	251	290
90th percentile	619	367	436
		(percent)	
Rent to FMR ratio			
Median	49	27	30
> 1	1	0	0
0.76 to 1	12	2	3
0.51 to 0.75	36	11	14
0.26 to 0.5	49	41	42
< 0.26	2	47	41
Rent to income-based rent ratio			
Median	68	100	100
> 1.01	1	7	5
1.00 to 1.01	3	92	81
0.76 to 0.99	34	0	4
0.51 to 0.75	40	0	5
0.26 to 0.5	21	0	3
< 0.26	1	0	0

FMR = Fair Market Rent.

Note: R-square for the current formula is 0.787; 0.927 for the Administration's proposal.

Source: Office of Public and Indian Housing Information Center system (PIC system)

Dispersion of Flat Rents Across PHAs and Comparison of Tract Poverty in Census Tracts With Concentrations of Flat Rents

Exhibit 9 shows the census tract poverty rate for each public housing unit.[13] The exhibit shows that units with flat rents in general are located in tracts with similar poverty rates as other public housing units.

This finding indicates that households paying flat rents in New York City tend to live in high-poverty tracts. (Three-fourths of the households paying flat rents are in tracts with a poverty rate

[13] The poverty rate is missing for about 11 percent of the units because of missing geocoding information.

Exhibit 9

Distribution of Poverty Rate by Household Rent Type

	Number of Units	Tract Poverty Rate (percent)	Percent of Units
Flat-rent units	92,207	Average	31
		0 to 9	7
		10 to 19	24
		20 to 29	23
		30 or more	46
Other public housing units	677,465	Average	30
		0 to 9	10
		10 to 19	24
		20 to 29	22
		30 or more	44

Source: Office of Public and Indian Housing Information Center system (PIC system)

above 75 percent, and the average poverty rate is 40 percent.) This finding is offset by the fact that households paying flat rents in other locations tend to be in higher income tracts than other public housing residents. The average poverty rate of census tracts for households paying flat rents in locations outside New York City is 25 percent (compared with 30 percent for households living in other public housing outside the New York City area), and only 31 percent of households paying flat rents in locations outside New York City live in tracts with poverty rates of more than 30 percent (compared with 44 percent of other public housing residents).[14]

The next portion of this analysis focuses on differences in poverty rates in tracts with concentrations of flat-rent units versus other tracts with public housing units.

We defined a concentration of flat-rent units in the following ways:

1. Among tracts with any flat-rent units, the average number was 13 flat-rent units; they accounted for, on average, 19 percent of the tract's public housing units. Thus, one way to define a tract with a cluster of flat-rent units is to identify any tract with at least 13 flat-rent units that account for at least 19 percent of the public housing units in the tract. This definition includes 925 tracts with 51,637 flat-rent units (or 56 percent of flat-rent units).
2. We could arbitrarily say that a tract with a concentration of flat-rent units must have at least 10 flat-rent units, accounting for at least 10 percent of the tract's public housing units. This definition includes 1,740 tracts with 69,156 flat-rent units (or 75 percent of flat-rent units).
3. Similar to the second definition, we could set a higher threshold to define a concentration; for example, we could require that the tract have at least 20 flat-rent units, accounting for at least 20 percent of the tract's public housing units. This definition includes 614 tracts with 47,026 flat-rent units (or 51 percent of flat-rent units).

[14] See exhibit B-3 in appendix B.

We compared tracts with high concentrations of flat-rent units with tracts with high concentrations of public housing units with other rents (using the same definitions of concentration as was used for the flat-rent concentration).[15] As shown in exhibit 10, all three of these definitions yield similar findings regarding concentrations of poverty.

Exhibit 10

Comparison of Tract Poverty Rate

Census Tracts With a High Concentration of Flat-Rent Units Versus Other Census Tracts With Public Housing Units

Definition #1: A census tract must have at least 13 flat-rent units, and the flat-rent units must account for at least 19 percent of the total public housing units in that tract.

	Census Tracts With a High Concentration of Flat-Rent Units	Census Tracts With a High Concentration of Other Public Housing Units
Number of census tracts	925	7,247
Number of flat-rent units or other units covered	51,637	655,965
Percent of flat-rent units or other units covered	56	97
Poverty rate	(percent)	
Average	25	23
0 to 9	9	17
10 to 19	36	35
20 to 29	25	23
30 or more	30	25
Total	100	100

Definition #2: A census tract must have at least 10 flat-rent units, and the flat-rent units must account for at least 10 percent of the total public housing units in that tract.

	Census Tracts With a High Concentration of Flat-Rent Units	Census Tracts With a High Concentration of Other Public Housing Units
Number of census tracts	1,740	7,793
Number of flat-rent units or other units covered	69,156	661,925
Percent of flat-rent units or other units covered	75	98
Poverty rate (percent)	(percent)	
Average	25	23
0 to 9	9	18
10 to 19	36	35
20 to 29	26	22
30 or more	29	25
Total	100	100

[15] Note that tracts with high concentrations of public housing units account for nearly all public housing units (95 to 98 percent, depending on the definition of concentration used) but only for about two-thirds to three-fourths of tracts, depending on the definition. These findings mean that a large number of tracts have a very small number of public housing units.

Exhibit 10

Comparison of Tract Poverty Rate (continued)

Definition #3: A census tract must have at least 20 flat-rent units, and the flat-rent units must account for at least 20 percent of the total public housing units in that tract.

	Census Tracts With a High Concentration of Flat-Rent Units	Census Tracts With a High Concentration of Other Public Housing Units
Number of census tracts	614	6,334
Number of flat-rent units or other units covered	47,026	641,425
Percent of flat-rent units or other units covered	51	95
Poverty rate (percent)	(percent)	
Average	28	23
0 to 9	5	15
10 to 19	31	34
20 to 29	27	23
30 or more	37	27
Total	100	100

Note: Of the overall public housing units, 11 percent are excluded from this analysis due to missing geocoding information.
Source: Office of Public and Indian Housing Information Center system (PIC system)

The following list summarizes our analysis of tract poverty levels:

- Tracts with high concentrations of flat-rent units have slightly higher poverty rates than census tracts that include high concentrations of other public housing units. This finding might be driven in part by the fact that smaller, rural PHAs do not have flat rents and some PHAs did not provide geocodable address information.[16]
- According to each of these definitions, less than 10 percent of tracts with high concentrations of flat-rent units have low poverty rates (below 10 percent poverty). In contrast, 18 percent or less of tracts with high concentrations of other public housing units are low poverty tracts.
- At the other extreme, depending on the definition used, anywhere from 29 to 37 percent of tracts with high concentrations of flat-rent units had poverty rates greater than 30 percent. This finding compares to about 25 percent of tracts with high concentrations of other public housing units.

These findings seem to be contrary to expectations. Because households paying flat rents have higher incomes, we might expect concentrations of flat-rent units in lower poverty tracts; however, the data show that tracts with high concentrations of flat-rent units tend to have higher poverty rates than other tracts with public housing units have. This finding may be a result of the fact that when HUD introduced flat rents, the Department suggested that a very low flat rent in a less-than-desirable development could be a strategy for attracting and keeping higher income families and, thus, stabilizing the community. It also may be driven in part by the fact that flat-rent units in New York City tend to be in high-poverty tracts. The high concentration of flat-rent units in New York City could be affecting this result.

[16] To identify the tract-level characteristics, we needed to geocode the properties to obtain their census tract. Necessary information was missing for about 11 percent of all properties.

Changes in Wages and Turnovers in Properties With Flat Rents Compared With Other Properties

Exhibit 11 compares properties with clusters of flat-rent units and other public housing developments relating to tenant turnover rates and wage increases. We might hypothesize that allowing residents to pay flat rents would enable residents to stay in their units as their income increases, thus increasing tenure (and decreasing turnover). Turnover rate is measured as a portion of households that moved in within the previous year. Similarly, we might expect higher wage increases in these properties because residents have no negative incentives associated with increased income.

As with defining concentrations of flat-rent units in census tracts, we used three alternative definitions of clusters of flat-rent units in a property.

Exhibit 11

Comparison of Wage Increase and Turnover

Developments With a Cluster of Flat-Rent Units Versus Other Public Housing Units

Definition #1: A development must have at least 10 flat-rent units, and the flat-rent units must account for at least 10 percent of the units in the development.

	Developments With a Cluster of Flat-Rent Units	Other Public Housing Developments
Number of developments	2,071	11,039
Number of flat-rent units covered	67,607	31,926
Percent of flat-rent units covered	68	32
Percent of wage increase (2003 to 2005)	6	4
Percent of tenants moved in within past year	14	13

Definition #2: A development must have at least 10 flat-rent units, and the flat-rent units must account for at least 15 percent of the units in the development.

	Developments With a Cluster of Flat-Rent Units	Other Public Housing Developments
Number of developments	1,685	11,425
Number of flat-rent units covered	60,893	38,640
Percent of flat-rent units covered	61	39
Percent of wage increase (2003 to 2005)	6	3
Percent of tenants moved in within past year	14	12

Definition #3: A development must have at least 20 flat-rent units, and the flat-rent units must account for at least 20 percent of the units in the development.

	Developments With a Cluster of Flat-Rent Units	Other Public Housing Developments
Number of developments	568	12,542
Number of flat-rent units covered	43,099	56,434
Percent of flat-rent units covered	43	57
Percent of wage increase (2003 to 2005)	7	4
Percent of tenants moved in within past year	18	13

Source: Office of Public and Indian Housing Information Center system (PIC system)

1. A property with at least 10 flat-rent units, accounting for at least 10 percent of the units in the property.
2. A property with at least 10 flat-rent units, accounting for at least 15 percent of the units in the property.
3. A property with at least 20 flat-rent units, accounting for at least 20 percent of the units in the property.

To conduct the analysis, we identified projects with a cluster of flat rents in 2003 and tracked the tenant wage and turnover status of these properties in 2005. The following points summarize our findings:

- As exhibit 11 shows, according to all three definitions of clusters of flat-rent units, we find that tenant wages in these properties increased more than in other public housing developments between 2003 and 2005. Tenant wages increased by about 6 to 7 percent, compared with a 3- to 4-percent increase in other public housing developments.
- Turnover rates in these properties, however, were higher than in other developments, averaging about 14 to 18 percent compared with a 12- to 13-percent turnover rate in other public housing developments. (The data are for a development as a whole, and not specifically for the households paying flat rents.)

Income Mixing in Properties With Flat Rents Compared With Other Public Housing Properties

A commonly used measure of income mixing is the coefficient of variation of a project's tenant income distribution, defined as the standard deviation of the income distribution divided by the mean household income in the property, expressed as a percentage. The larger the percentage, the more income mixing a property has. For example, HUD's data file, "A Picture of Subsidized Households in 1998," uses the same measure to assess income mixing across projects in HUD's assisted housing programs.

Exhibit 12 shows the average coefficient of variation for properties with any flat-rent units, for properties with clusters of flat-rent units, and for other public housing properties. As with defining concentrations of flat-rent units in census tracts, we used three alternative definitions of clusters of flat-rent units in a property.

1. A property with at least 10 flat-rent units, accounting for at least 10 percent of the units in the property. This definition includes 1,685 properties with 60,893 flat-rent units (or 61 percent of flat-rent units).
2. A property with at least 10 flat-rent units, accounting for at least 15 percent of the units in the property. This definition includes 2,071 properties with 67,607 flat-rent units (or 68 percent of flat-rent units).
3. A property with at least 20 flat-rent units, accounting for at least 20 percent of the units in the property. This definition includes 568 properties with 43,099 flat-rent units (or 43 percent of flat-rent units).

Regardless of the definition of a cluster used, properties with flat-rent units have a higher degree of income mixing than other properties. This outcome is as expected because households in units with flat rents have higher incomes than most other public housing residents.

Exhibit 12

Comparison of Income Mixing

Developments With Any Flat-Rent Units Versus Developments Without Any Flat-Rent Units

	Developments With a Cluster of Flat-Rent Units	Other Public Housing Developments
Number of developments	9,925	3,185
Number of flat-rent units covered	99,533	0
Percent of flat-rent units covered	100	0
Coefficient of variation of the income distribution average (percent)	63	52

Cluster Definition #1: A development must have at least 10 flat-rent units, and the flat-rent units must account for at least 10 percent of the units in the development.

	Developments With a Cluster of Flat-Rent Units	Other Public Housing Developments
Number of developments	2,071	11,039
Number of flat-rent units covered	67,607	31,926
Percent of flat-rent units covered	68	32
Coefficient of variation of the income distribution average (percent)	65	59

Cluster Definition #2: A development must have at least 10 flat-rent units, and the flat-rent units must account for at least 15 percent of the units in the development.

	Developments With a Cluster of Flat-Rent Units	Other Public Housing Developments
Number of developments	1,685	11,425
Number of flat-rent units covered	60,893	38,640
Percent of flat-rent units covered	61	39
Coefficient of variation of the income distribution average (percent)	65	59

Cluster Definition #3: A development must have at least 20 flat-rent units, and the flat-rent units must account for at least 20 percent of the units in the development.

	Developments With a Cluster of Flat-Rent Units	Other Public Housing Developments
Number of developments	568	12,542
Number of flat-rent units covered	43,099	56,434
Percent of flat-rent units covered	43	57
Coefficient of variation of the income distribution average (percent)	68	60

Note: Coefficient of variation (CV) is defined as the standard deviation divided by the mean. The larger the CV, the more income mixing there is.

Source: Office of Public and Indian Housing Information Center system (PIC system)

Summary and Conclusions

This study used extracts from HUD's PIC data system from 2003 through 2005 to describe the characteristics of PHAs and households that use flat rents. Following are some key findings:

PHAs Using Flat Rents

- Nearly all PHAs have at least some flat-rent units; however, the proportion of flat-rent units is generally small. Flat-rent units account for less than 10 percent of units in nearly half of all PHAs with flat-rent units.
- Overall, flat rents are paid for about 100,000, or 11.5 percent, of all public housing units. New York City, with 32,179 flat-rent units, accounted for about one-third of all flat-rent units nationwide.

Characteristics of Households in Units With Flat Rents

- As expected, households paying flat rents had much higher incomes compared with other public housing residents. Similarly, a much higher percentage of households paying flat rents reported that most of their income was from wages compared with other public housing households. Thus, flat rents appear to be succeeding in allowing residents in these units to increase incomes through employment and to remain in their units even as their incomes increase.
- The higher incomes of households paying flat rents are influenced to some extent by the fact that a large fraction of flat-rent units are in New York City, where incomes and rents tend to be higher than in other places. Incomes of households paying flat rents outside New York City, however, are still substantially higher than incomes of other public housing residents.

Changes in the Use of Flat Rents by Families During the 2003-Through-2005 Period

- Households often move in and out of paying flat rents. Less than half of the households paying flat rents in 2003 continued to do so in 2005.
- It appears that the main reason households switch from flat rents to other rents is because their income decreases. More than three-quarters of households moving from flat rents to other rents experienced a decrease in income. In comparison, most households that continued to pay flat rents experienced an increase in income over time. This finding may be an indication that flat rents are accomplishing their legislative intent of enabling higher income residents to remain in public housing as their incomes increase.

Assessment of Flat Rents Relative to Local Rents and Relative to Income-Based Rents

- Rents in units where residents were paying flat rents were substantially higher than rents in other public housing units. (As in the case of income, this fact is partially influenced by the large fraction of flat-rent units located in New York City; but even outside New York City, flat rents are much higher than rents in other public housing units.)

- Rents in both units with flat rents and other rents were well below comparable market levels (as proxied by the local FMR). More than half the rents in units with flat-rent units had rents below 50 percent of the FMR, as did nearly 90 percent of other units.
- Households paying flat rents were virtually always paying less than 30 percent of their income for rent. Most were paying less than 75 percent of the comparable income-based rent. As expected, households in other units typically paid the income-based rent, defined as 30 percent of income.

Dispersion of Flat Rents Across PHAs and Comparison of Tract Poverty in Census Tracts With Concentrations of Flat Rents

- Units with flat rents are generally located in tracts with similar poverty rates as other public housing units. This finding indicates that households paying flat rents in New York City tend to live in high-poverty tracts, which is offset by the fact that households paying flat rents in other locations tend to be in higher income tracts than other public housing residents.
- Tracts with high concentrations of flat-rent units tend to have higher poverty rates than tracts with high concentrations of other public housing units. This finding is in contrast with expectations. Because households paying flat rents have higher incomes, we might expect concentrations of flat-rent units in lower poverty tracts. This counterintuitive finding may have resulted when flat rents were introduced; HUD suggested that a very low flat rent in a less-than-desirable development could be a strategy for attracting and keeping higher income families and, thus, stabilizing the community. It also may be driven in part by the fact that flat-rent units in New York City are in high-poverty tracts. The high concentration of flat-rent units in New York City could be affecting this result.

Changes in Wages and Turnovers in Properties With Flat Rents Compared With Other Properties

- We might expect higher wage increases in properties with high concentrations of flat-rent units because residents have no negative incentives associated with increased income. In fact, we do find that wages in these properties increased more than in other public housing developments between 2003 and 2005.
- Similarly, we might expect lower turnover rates in properties with concentrations of flat rents (because households paying flat rents do not have an incentive to move). The data, however, show that turnover, measured as the portion of households that moved in within the previous year, was slightly higher than in other developments. (The data are for a development as a whole and not specifically for the flat-rent households.)

Income Mixing in Properties With Flat Rents Compared With Other Public Housing Properties

- Properties with flat-rent units have a higher degree of income mixing than other properties. This finding is as expected because households in units with flat rents have higher incomes than most other public housing residents have.

Appendix A. Rent Determination Algorithm

Definition

The following line items are reported on page 8 of HUD Form-50058:

10a = Total Tenant Payment (TTP) (generally 30 percent of adjusted income minus utility allowance).

10b = flat-rent amount.

10c = ceiling-rent amount.

10d = lower of TTP or ceiling rent.

10u = Type of rent code—an indicator flagging whether a household selects to pay a flat rent or an income-based rent.

Determination of Flat-Rent Units

Household records are determined as paying flat rents if any of the following conditions is true:

- Type of action = 12, and flat-rent amount > 0.
- Type of rent code = F, and flat-rent amount > 0.
- Type of rent code = blank, and flat-rent amount > 0, and flat-rent amount < TTP, and flat-rent amount = lower rent amount (that is, line item 10d).

Determination of Ceiling-Rent Units

Household records are determined as paying ceiling rents if the following condition is true:

- Ceiling rent amount > 0 and TTP > or = ceiling rent and ceiling rent = lower rent amount.

Determination of Income-Based Rent Units

Household records are determined as paying a nonceiling income-based rent if any of the following conditions is true:

- The record has not already been flagged as flat-rent units or ceiling-rent units, and lower rent amount > 0, and type of rent code = I.
- The record has not already been flagged as a flat-rent unit, ceiling-rent unit, or income-based rent, and TTP = lower rent amount, and lower rent amount > 0.

Appendix B. Supplementary Tables

Exhibit B-1

Characteristics of Households in Units Paying Flat Rents in New York City and Elsewhere—2005 Data

	Flat-Rent Units in New York City	Flat-Rent Units Elsewhere	All Flat-Rent Units
Number of housing units	32,179	67,354	99,533
Percent of all units	32.3	67.7	100
Age of household head (average)	52.0	51.0	51.3
		(percent)	
Disability status of household head			
Yes	5	14	12
No	95	86	88
Total	100	100	100
Race/ethnicity of household head			
Non-Hispanic White	5	45	32
Non-Hispanic African American	55	42	46
Hispanic	37	11	19
Other	3	2	2
Total	100	100	100
Presence of children in household			
Yes	38	39	39
No	62	61	61
Total	100	100	100
		(dollars)	
Total household income (average)	37,606	23,663	28,150
		(percent)	
Household income as percent of area median	69	46	52
Source of income			
Most of income from wage			
Yes	82	61	68
No	18	39	32
Total	100	100	100
Most of income from welfare			
Yes	0	1	1
No	100	99	99
Total	100	100	100

Source: Office of Public and Indian Housing Information Center system (PIC system)

Exhibit B-2

Rent Comparisons in Units With Flat Rents in New York City and Elsewhere

	Flat-Rent Units in New York City	Flat-Rent Units Elsewhere	All Flat-Rent Units
Number of housing units	32,179	67,354	99,533
Percent	32.3	67.7	100
		(dollars)	
Rent level charged			
Mean	510	366	413
Median	495	333	416
Standard deviation	77	167	159
Percentile statistic			
10th percentile	421	200	225
25th percentile	495	259	296
75th percentile	495	430	495
90th percentile	619	575	619
		(percent)	
Rent to FMR ratio			
Median	46	59	49
> 1	0	1	1
0.76 to 1	0	18	12
0.51 to 0.75	1	52	36
0.26 to 0.5	99	26	49
< 0.26	0	3	2
Rent to income-based rent ratio			
Median	62	70	68
> 1.01	0	2	1
1.00 to 1.01	1	4	3
0.76 to 0.99	28	36	34
0.51 to 0.75	41	40	40
0.26 to 0.5	29	17	21
< 0.26	1	1	1

FMR = Fair Market Rent.

Note: Income-based rents are defined as 30 percent of adjusted income.

Source: Office of Public and Indian Housing Information Center system (PIC system)

Exhibit B-3

Distribution of Poverty Rate by Household Rent Type in Flat-Rent Units in New York City and Elsewhere

	Number of Units	Tract Poverty Rate (percent)	Percent of Units
Flat-rent units in New York City	32,029	Average	40
		0 to 9	1
		10 to 19	6
		20 to 29	18
		30 or more	75
Flat-rent units elsewhere	60,178	Average	25
		0 to 9	10
		10 to 19	34
		20 to 29	25
		30 or more	31
All flat-rent units	92,207	Average	31
		0 to 9	7
		10 to 19	24
		20 to 29	23
		30 or more	46

Source: Office of Public and Indian Housing Information Center system (PIC system)

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Household Life Cycle and Length of Stay in Housing Assistance Programs

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Abstract

In 1998, public housing agencies (PHAs) were given considerable discretion to select tenants on the basis of local PHA preferences rather than on old federal preferences for households experiencing housing-related hardships. Many PHAs have adopted other categorical preferences. As a result, the demographic profile and household composition of public housing tenants have changed. These changes have important implications for the U.S. Department of Housing and Urban Development's Housing Choice Voucher Program (HCVP), because past research has found that household characteristics and location factors significantly affect a household's length of stay in the program. The study described in this article uses administrative data to explore the factors associated with a household's length of stay in the HCVP. The study focuses on the degree to which the presence of children of varying ages affects a household's length of stay in the program and the degree to which older children, as a potential source of childcare, may mitigate a longer duration of housing assistance. The study also explores the degree to which the disability status of the household head or children affects a household's length of stay in the program. The study's main finding is that the presence of an infant or a toddler increases a household's length of stay in the HCVP, after controlling for an array of household and location characteristics, but the presence of other children in the same household attenuates this effect. Conversely, the study finds that the presence of teenagers, especially male teenagers, magnifies this effect.

Introduction

The U.S. Department of Housing and Urban Development's (HUD's) Housing Choice Voucher Program (HCVP)—formerly called the Section 8 Rental Certificate Program—was created in 1974; since then, it has become a primary federal vehicle for providing housing assistance to low-income households. In 2005, the program served more than 1.9 million households.[1] For many years, the program was targeted to households that were experiencing various housing-related hardships, such as being involuntary displaced, living in substandard housing, being homeless, and paying more than 50 percent of household income for rent. Public housing agencies (PHAs) across the country were charged with administering the program and were required by law to allocate 90 percent of their vouchers (and certificates) to households that were confronting housing-related hardships (Devine et al., 2000).

In 1998, federal preferences for households with housing-related hardships were repealed under the Quality Housing and Work Responsibility Act (QHWRA), and PHAs were given considerable discretion in selecting tenants on the basis of local PHA preferences. For example, PHAs may select people from their waiting lists who are enrolled in training programs or who are already working, although PHAs that adopt a preference for working tenants must also give an equal preference to heads of households who are elderly and people with disabilities. PHAs are simultaneously expected to allocate 75 percent of their vouchers to households with adjusted incomes that do not exceed 30 percent of the area median income (AMI). Research conducted in 2000 suggests that very few PHAs nationally (12 percent) base their program preferences exclusively on the old federal preferences, and most PHAs have adopted other categorical preferences (Devine et al., 2000). These preference decisions, in turn, have altered the composition of households served by the HCVP nationwide.

Changes in household composition have important implications for the HCVP. Recent research using administrative data on HCVP participants suggests that household and location characteristics affect a household's length of stay in the program (Ambrose, 2005; Freeman, 2005; Olsen, Davis, and Carrillo, 2005). Some household characteristics (for example, being elderly or disabled) are associated with longer lengths of stay in the program and others (for example, higher income and younger age groups) are associated with shorter lengths of stay. This evidence suggests that PHAs that alter their tenant compositions on purpose may unknowingly be affecting the amount of time that households use the voucher and, thus, potentially limiting the number of vouchers available to serve households on the PHAs' waiting lists. Conversely, changing tenant composition may lead to quicker exits from the program, which, in turn, would free up vouchers for other needy households. Therefore, to understand how vouchers are used nationwide, we must first understand which household characteristics affect HCVP attrition rates.

The study described in this article analyzes administrative data from HUD to explore household characteristics that are associated with a household's length of stay in the HCVP. Although a number of such characteristics have been analyzed previously, this article focuses on the degree to which the presence of children of varying ages is related to a household's length of stay in the

[1] The total includes 11,221 certificates and 1,922,654 vouchers.

program and the degree to which older children, as a potential source of childcare, may mitigate a longer duration of assistance for households with infants and toddlers. The study also explores the degree to which the disability status of the household head or children affects a household's length of stay in the program. Previous research has found disability status to be strongly associated with attrition rates in housing assistance programs. To understand better the unique constraints for households with a disabled head of household or child with disabilities, we compare characteristics associated with length of stay in the program across three types of heads of households: nonelderly heads of households with a child or children; nonelderly, disabled heads of households with a child or children; and nonelderly heads of households with at least one disabled child.

Literature Review: A Brief Summary

An emerging body of literature explores the length of time that a household receives housing assistance and the factors that influence the length of time. Research suggests that attrition rates in assisted housing are associated with multiple factors, including tenants' socioeconomic characteristics, changes in household composition, housing market conditions and the availability of affordable housing options, and the year of entry into assisted housing. Particular attention has been given to characteristics that describe the life cycle of a program participant, such as year of entry and age composition, and several metropolitanwide economic factors, such as wages, demand for labor, and rent structures.

Using the Longitudinal Occupancy, Demography, and Income file,[2] Olsen, Davis, and Carrillo (2005) conclude that elderly status and disability status of the head of household are by far the two largest influences on a household's decision to leave the HCVP. Heads of households who have disabilities are about 37 percent less likely to exit the tenant-based HCVP, and heads of households who are elderly are about 23 percent less likely to exit compared with otherwise similar households. Other household characteristics, such as race and size of the household, played a much smaller role in explaining differences in attrition rates. The study also found that a $100-per-month lower local payment standard was associated with a 3-percent higher rate of program exit and a $100-per-month higher minimum tenant contribution to rent was associated with a 13-percent higher program attrition rate.

Ambrose (2005) used a random sample of households from HUD's Multifamily Tenant Characteristics System (MTCS) and Tenant Rental Assistance Certification System (TRACS) and found that individual characteristics are very important to understanding a program participant's exit from the tenant-based HCVP, a public housing program, or a project-based housing program. Elderly heads of households are 48, 56, and 59 percent, respectively, less likely to exit from these programs; disabled heads of households are 54, 76, and 57 percent, respectively, less likely to exit. Gender, race, income, housing composition, housing location, and city size were also found to be statistically significant factors in determining the likelihood of a participant's leaving assisted housing. The effects of local economic conditions on program exits varied by program type.

[2] The file contains data from HUD's Multifamily Tenant Characteristics System and Tenant Rental Assistance Certification System for 1995 through 2002.

Freeman (2005) used data from the New York City Housing and Vacancy Survey to explore whether household composition is related to the receipt of housing assistance. Freeman found that the likelihood of exiting housing assistance is highest in the earliest years of a housing assistance stay and that the most significant predicators of ending a housing assistance stay were residing in public housing; being White, young, and nondisabled; and having no children. The vacancy rate of the local housing market was also a predicator. The study also suggested that recipients of housing assistance were less likely to be married and less likely to get married over time, but little evidence was found that housing assistance contributed to the dissolution of partnerships. In addition, recipients of housing assistance have more children, but, after they receive housing assistance, they are less likely to have additional children.

Bahchieva and Hosier (2001) used administrative data from the New York City Housing Authority to explore lengths of stay in public housing. The authors found that lengths of stay were influenced by demographic characteristics, income level and sources, and housing characteristics. The highest exit rates were among participants with incomes exceeding 80 percent of AMI, single people, young or very old heads of households, White heads of households, and non-Hispanic immigrants. The authors also found that tenants in smaller apartments and higher crime neighborhoods had higher exit rates, and previously homeless people had the highest probability of exiting during the early years of tenure. Most striking, the median length of stay derived from a survival analysis is more than 42 years, and more than one-quarter of the lengths of stay are more than 55 years. These very long lengths of stay likely are associated with the very tight housing market in New York City, which greatly restricts mobility options among low-income households.

Before these recent studies, most research relied on surveys that asked program participants to self-report their housing assistance status, although evidence suggests that such self-reporting may be unreliable (Shroder, 2002). Freeman (1998) used data from the Panel Study of Income Dynamics to examine the dynamics of residents in public housing and found that demographic, location, and cultural factors—including where residents grew up, the educational attainment of heads of households, and whether a child grew up in a household with both parents—influence lengths of stay, or durations, in public housing. Freeman concludes that quicker exits from public housing are associated with various factors: growing up in a two-parent family; being non-Hispanic; having more than a primary school education (1–8 years of school); having additional work experience; being divorced; residing in an area with a higher vacancy rate and more affordable housing units; and living in the Northeast or Midwest. In addition, Freeman did not find evidence supporting the notion that participants who use housing assistance for longer periods of time are less likely to exit, sometimes referred to as the "duration dependence phenomenon." The duration dependence phenomenon suggests that program participants become accustomed to living with housing assistance and making ends meet and, thus, are less likely to exit the program (Bane and Ellwood, 1994).

Susin (1999) used data from the Survey of Income and Program Participation to examine the effect of employment, earnings, and household composition on the length of housing subsidy. The study's main finding is that employment and earnings are modestly associated with an exit from subsidized housing, and up to 56 percent of exits are associated with household composition changes (for example, the birth of a child or a marriage). Susin also found that other household characteristics—such as having a high school degree, higher earnings and income, and welfare

receipt—and location factors, such as a local area's median rent and the state vacancy rate—were important predictors of exiting from subsidized housing.

Conceptual Framework for Understanding the Effect of Children on a Household's Length of Stay in the HCVP

Past research underscores the important relationship between households' life cycles and length of stay in assisted housing, but little is known about the independent effect of children on the length of stay. On initial reflection, the relationship between the presence of children and length of stay in the program is not obvious.

Associations between the presence of children and the length of time households receive housing assistance seem especially likely when households include either infants or toddlers together with teenagers. The presence of infants or toddlers may lead some households to remain in the housing program if the heads of households cannot find adequate daycare and, consequently, are unable to obtain gainful employment to pay rent in the private market. Among participants in the HCVP, lack of good-quality childcare has been found to be one of the most important barriers to finding employment and, thus, becoming self-sufficient (Reed, Pashup, and Snell, 2005; Turnham et al., 2006).

The presence of teenagers ages 13–17 may influence the exit of households from housing assistance in different ways, albeit very limited evidence exists describing this potential association. On one hand, the presence of teenagers may increase the likelihood of exits from the HCVP. Research on welfare recipients suggests that program-induced increases in maternal employment, especially in low-wage labor markets, may lead some teenagers to assume more household and adult-like responsibilities, such as caring for younger children in the household, housecleaning, shopping, cooking, or employment (Burton, 1997). Female teenagers are particularly more likely to assume household duties (Dodson and Dickert, 2004). Although this research focuses on the effect of maternal employment on teenagers, it also raises the possibility of an inverse dynamic: heads of households may be more likely to become employed if a teenager is available to help care for younger children in the household. Expressed differently, the presence of teenagers—especially female teenagers—may help a household become self-sufficient if the head of the household can leave the children with the teenager and find gainful employment, rather than stay home to care for the children.

On the other hand, teenagers often present more challenges to households. Households that have teenagers who are getting into trouble in school or in the neighborhood may be prompted to move to another community to change the teenager's environment. Some of these moves may be portability moves (that is, the household continues to receive housing assistance in another PHA's jurisdiction) and other moves may involve exits from the program altogether if the household has sufficient resources. In some cases, households may have greater incentives to become self-sufficient and exit housing assistance if they believe they can improve their teenagers' environment and, in turn, their outcomes as adults. Previous research that focused on recipients of Temporary Assistance for Needy Families who also received tenant-based rental assistance suggests that recipients' decisions to move are influenced greatly by their desire to improve their children's well-being (Turnham et al., 2006).

Alternatively, some households with at-risk teenagers may feel overwhelmed by the stresses brought on by teenagers and decide to focus on stabilizing their family life before considering other important choices (for example, seeking employment, asking for a raise, or uprooting the family and moving elsewhere). As Turnham et al. (2006) suggest, families in the HCVP are confronted by an array of stressful circumstances at home and in their neighborhoods—paying rent and utilities, coping with the absence of a male partner/spouse, avoiding drug and criminal activity in the neighborhood, providing for their children—and many families triage their living situation by focusing on one issue at a time. Families may choose to focus on the well-being of their teenagers before considering other issues that, in turn, could affect their self-sufficiency outcomes and ability to exit the HCVP.

Some households with teenagers may be less willing to exit housing assistance if they prefer to keep teenagers rooted in their social settings, especially the teenagers' school and friends, and the housing assistance enables them to stay where they are. Studies that have explored household outcomes following moves to different communities—aided by housing assistance—demonstrate that some households continue to send their teenage children back to the schools located in previous neighborhoods (Orr et al., 2003). If housing assistance is helping a household maintain a teenager's routine, the housing assistance may be providing a disincentive for households to become self-sufficient and exit housing assistance.

The potential effects of young children (ages 6–12) on the length of time a household stays in the program are less understood or studied. Young children may delay a household's exit from housing assistance for some of the same reasons associated with infants and toddlers. On the other hand, children approaching their teens may be asked by the head of household to babysit younger children in the household while the head of household is working or taking other steps to become self-sufficient (for example, enrolling in a job training program, going to a job interview, or completing a certificate or degree program).

The Data

This analysis uses data from three data sources: (1) administrative data collected in HUD's MTCS/Public and Indian Housing Information Center (PIC) system between 1997 and 2005, (2) the 2000 Decennial Census, and (3) the Low-Income Housing Tax Credit database.

The MTCS/PIC database from 1997 to 2005 contains nearly 14 million records—3.3 million certificate records and 10.5 million voucher records. The total number of records increases steadily from about 1.1 million in 1997 (about 807,000 certificates and 274,000 vouchers) to 1.9 million in 2005 (approximately 11,000 certificates and 1.88 million vouchers). The universe of records for the analysis consists of households in the MTCS/PIC data file that began receiving assistance in 1997 or later. Some of those households may have experienced housing assistance before 1997, but at some point they exited the program and then reentered between 1997 and 2005. We addressed three key data issues to construct the MTCS/PIC analysis file: (1) truncated records, (2) discontinuities in the longitudinal data file, and (3) unrecorded or unknown exits from the program.[3] After we addressed these issues and identified new program entrants between 1997 and 2004,

[3] Further information on how these issues were addressed is available from the authors.

we selected three types of heads of households: (1) nonelderly heads of households with a child or children; (2) nonelderly, disabled heads of households with a child or children; and (3) nonelderly heads of households with at least one disabled child.[4] In this study, we used all records associated with these head-of-household types.

Exhibit 1 shows the total number of records in the analysis file by head-of-household type and year of entry. Overall, the final analysis file contains nearly 760,000 records. The overwhelming majority of households (84 percent) are nonelderly heads of households with a child or children; some of the records (13 percent) are nonelderly, disabled heads of households with a child or children; and a few (3 percent) are nonelderly heads of households with at least one disabled child.

We used census data in the analysis to control for location factors that may influence households' lengths of stay in the HCVP. The census data provide indicators of level of urbanization (central city, suburb, and nonmetropolitan), census division of the United States, metropolitan civilian unemployment rate, and metropolitan statistical area/primary metropolitan statistical area (MSA/PMSA) housing vacancy rate. We also use census data to determine whether the PHA has a high mean rent in the metropolitan area. We sorted data from Census 2000 Summary File 3 by census tract and merged the information to the MTCS/PIC data file using the 2000 Census tract identifier.

Under a separate HUD contract, Abt Associates assembled a database with low-income housing tax credit (LIHTC) units placed in service between 1995 and 2004. The database includes information on a multitude of variables, including project location, number of total units, and number of tax credit units. Census tract identifiers also are attached to each record. We merged the LIHTC database to the MTCS/PIC data file to identify and control for the availability of LIHTC units in the same census tract as the household receiving housing assistance.

Exhibit 1

Number of Households in the HCVP Analysis File by Head-of-Household Type, 1997–2004

Year	Nonelderly Heads of Households With a Child or Children	Nonelderly, Disabled Heads of Households With a Child or Children	Nonelderly Heads of Households With at Least One Disabled Child	Total Household Records
1997	75,415	11,966	2,933	90,314
1998	72,460	11,353	2,772	86,585
1999	70,495	12,034	2,831	85,360
2000	70,516	11,119	2,976	84,611
2001	105,921	15,395	4,504	125,820
2002	92,271	13,292	3,717	109,280
2003	87,389	12,237	3,470	103,096
2004	63,305	8,510	2,676	74,491
Total	637,772	95,906	25,879	759,557

HCVP = Housing Choice Voucher Program.

[4] We constructed variables to identify each head-of-household type.

Using these data sources, we constructed several key variables needed to (1) address central study questions about the effects of children's age composition and of household members' disability status on HCVP length of stay; and (2) represent a series of covariates that we used to control for rival explanations (but which are also of interest in their own right). The covariates used included the age of the householder, availability of units funded by the Low-Income Housing Tax Credit program, race and ethnicity, income and sources of income, and other key household and location characteristics.[5] (The full list of covariates appears in exhibits 2, 3, and 4.)

The variables associated with the effect of children on program lengths of stay are particularly noteworthy. To measure the effects of children on a household's length of stay in the program, we constructed the following variables: the total number of children in the household (a continuous variable) and a series of dummy variables indicating whether the household included the presence of children in a series of specific age-gender categories.

To test hypotheses about caring for younger children in the household, we created a series of variables representing the interaction of dummy variables indicating the presence of infants (ages 0–3) and toddlers (ages 4–5) and variables indicating the presence of older boys and girls, both young children and teenagers. For variables on older boys and girls, we included dummy variables distinguishing male young children ages 6–12, female young children ages 6–12, male teenagers ages 13–17, and female teenagers ages 13–17.

The interaction terms allow us to explore the significance of spacing between children of different ages and to test if varying age groups are associated statistically with exits from the HCVP. The interaction terms also describe how the presence of young children and teenagers influences the potential effects of infants and toddlers on exits. For example, the hypothesis regarding caring for younger children in the household would be supported by a finding that households with infants stay on assistance longer than those without infants, but this effect is smaller when the household also includes the presence of a teenager. The next section describes our multivariate analysis strategy in detail.

The Methodology

We use a piecewise-exponential duration model to explore the relationship between household compositions—specifically, the presence of children of different ages—and length of stay, or duration, in the HCVP.[6] The model assumes that the exact timing of an event (that is, a household's exit from the HCVP) is known. The exact timing of the event is indicated by the "effective date of action" variable in the MTCS/PIC database. This model accounts for right-censoring and accommodates time-varying covariates.

[5] We also attempted to control for local rent structures by including two variables: the household's income in proportion to area median income and gross rent in proportion to Fair Market Rent. These variables were highly correlated with a metropolitan area's vacancy rate in the regression equation, which is problematic because parameters in duration models are estimated by an iterative numerical method called "maximum likelihood." When variables that are highly correlated are included in a model, the likelihood function does not converge and coefficient estimates cannot be produced.

[6] We used SAS software, as described in Allison (1995).

We used two regression models in the study. The first model contains the dummy variables that indicate whether a child of a particular age group is present, plus an array of household and location characteristics. The model does not include the child-interaction variables. The full model adds the child interaction variables to the first model. Both models are estimated separately for each type of head of household (that is, nonelderly heads of households with a child or children; nonelderly, disabled heads of households with a child or children; and nonelderly heads of households with at least one disabled child) and for the total universe of households.

Formally, the model is written:

$$\log[h_i(t)] = X_{i1}\beta_1 + X_{i2}\beta_2 + X_{i3}\beta_3 + X_{i4}\beta_4 + X_{i5}\beta_5 \qquad \text{(equation 1)}$$

where

$h_i(t)$ represents the duration of household i in the program at time period t;

X_{i1} represents 0-1 dummy variables indicating various entry years (cohorts);

X_{i2} is a set of variables accounting for the number and spacing of children of different ages in the household;

X_{i3} is a vector of household demographic variables;

X_{i4} includes the set of geographic covariates;

X_{i5} is a series of period-specific intercepts for the households; and

β_1, β_2, β_3, β_4, and β_5 are vectors of regression coefficients.

To interpret the magnitude of the regression coefficients, we transformed (or exponentiated) the parameter estimates reported by SAS software into a survival time ratio (Hosmer and Lemeshow, 1999). For a dummy (0/1) explanatory variable, the time ratio (that is, e^{β}) provides the estimated ratio of the expected survival time of the two groups, where the reference group is the group coded as 0 in the dummy variable. For instance, assume that the estimated coefficient for the dummy variable for wage income is negative 0.363. The time ratio, $e^{-0.363}$, is equal to 0.70 and suggests that a working household's length of stay in the program is 70 percent of the length of stay among households that are not in the labor force, after controlling for other covariates. For a continuous variable, the formula $100(e^{\beta}-1)$ yields the percentage increase in the expected survival time for a one-unit increase in the explanatory variable.

Parameter estimates associated with the child-related variables suggest whether and how HCVP exit probabilities are affected by the presence of children in a household. To test hypotheses about the effects of combinations of infants, toddlers, and older children, we add a series of multiplicative terms to a base model including only dummy variables for each main age group.

To control for other household characteristics and local labor and housing market conditions, the model includes numerous covariates (see exhibits 2, 3, and 4). Most of the covariates are measured as of the year of the tenant's program entry. Our variables capturing numbers of children in different age groups are time-varying, however, to reflect changes in age groups resulting from new arrivals in the household (for example, births) and departures (for example, young adults leaving home).

Including other covariates (apart from the number and age of children) helps to control for other factors that influence probabilities of exit from the HCVP, which could affect estimates of child-age effects.

In addition, the model includes a set of geographic variables to account for location effects. The number of LIHTC units in the census tract controls for the availability of alternative affordable rental units in the neighborhood. The unemployment and housing vacancy rate measures control for the greater likelihood that households in worse labor markets and households in tighter rental markets are more likely to remain in the HCVP. The dummy variables for central city, suburb, and rural location, plus the census division variables, control for fixed effects in these geographic locations.

Results

Exhibits 2, 3, and 4 provide descriptive profiles of the three types of heads of households in the study: nonelderly heads of households with a child or children; nonelderly, disabled heads of households with a child or children; and nonelderly heads of households with at least one disabled child. Exhibit 2 lists household characteristic variables, exhibit 3 lists the child-related variables, and exhibit 4 lists the location variables that are included in the analysis.

Household Characteristics

Exhibit 2 lists household characteristics for all households in the analysis file and for each head-of-household type. Overall, the three head-of-household types share many of the following characteristics:

- Small (averaging slightly more than three people in the household).
- Young (average age of household head is 31).
- Headed by a minority (60 percent of household heads are African American or Hispanic).
- Headed by a single person (91 percent of households do not have a spouse present).
- Poor (average annual income is $10,100, which is about 20 percent of the AMI).

We note a few key differences across the head-of-household types. Nonelderly heads of households with a child or children have significantly higher wage incomes compared with other head-of-household types. Nonelderly heads of households with a child or children earn about $6,300 annually, which is about five times greater than the wage income of nonelderly, disabled heads of households with a child or children ($1,209) and almost twice the amount of nonelderly heads of households with at least one disabled child ($3,585).

Also, nonelderly, disabled heads of households with a child or children are older than their counterparts. These head-of-household types are about 38 years old, and nearly two-thirds of these heads of households are adults ages 35 or older. By comparison, nonelderly heads of households with a child or children and nonelderly heads of households with at least one disabled child typically are adults 30 and 32 years old, respectively, and less than one-third of these heads of households are adults 35 years or older.

Exhibit 2

Descriptive Statistics for Households in the HCVP, Household Characteristic Variables

Variable	Household Characteristics	All Households		Nonelderly Heads of Households With a Child or Children		Nonelderly, Disabled Heads of Households With a Child or Children		Nonelderly Heads of Households With at Least One Disabled Child		Test of Difference in Means Across Groups
		Mean	Stdev	Mean	Stdev	Mean	Stdev	Mean	Stdev	
AgeHH	Age of household head	30.90	8.78	29.82	8.11	37.93	9.97	31.66	7.80	***
						(percent)				
FamSize	Total number of people in the household	3.26	1.25	3.25	1.23	3.21	1.27	3.74	1.43	***
Adult1824	Presence in household of adults ages 18–24	34	48	37	48	20	40	25	44	***
Adult2534	Presence in household of adults ages 25–34	43	49	44	50	34	47	51	50	***
Adult35p	Presence in household of adults ages 35 or older	33	47	28	45	64	48	33	47	***
White	Head of household is non-Hispanic White	37	48	36	48	44	50	28	45	***
Black	Head of household is non-Hispanic African American	45	50	45	50	40	49	55	50	***
Hispanic	Head of household is Hispanic	15	36	15	36	12	33	15	35	***
Other	Head of household is other race	3	18	3	18	4	20	3	16	***
Female	Head of household is female	91	29	92	27	82	38	94	24	***
nMarried	No spouse is present in household	90	29	91	28	85	36	93	25	***
Homeless	Head of household was previously homeless	3	18	3	18	3	18	4	19	
						(US$)				
Income	Total household annual income	10,093	6,308	10,011	6,469	10,339	5,067	11,135	6,449	***
Asset	Total household asset amount	47	886	44	790	70	1,392	46	684	
Wage	Total household wage income	5,553	7,355	6,290	7,550	1,209	3,883	3,585	6,328	***
adjAMI	Household income in proportion to AMI	20	12	20	12	21	10	22	12	***
adjRent	Gross rent in proportion to FMR	101	137	101	103	100	20	119	526	***
						(number)				
Number of households		759,557		637,772		95,906		25,879		

AMI = area median income. FMR = Fair Market Rent. HCVP = Housing Choice Voucher Program. Stdev = standard deviation.

*Notes: *** significance at the 1-percent level; ** significance at the 5-percent level; * significance at the 10-percent level.*

The nonelderly heads of households with at least one disabled child are often African American (55 percent), which is about 10 and 15 percentage points greater than the proportion associated with nonelderly heads of households with a child or children and nonelderly, disabled heads of households with a child or children, respectively. In addition, these head-of-household types are paying about 20 percent more than Fair Market Rent (FMR).[7] Nonelderly heads of households with a child or children and nonelderly, disabled heads of households with a child or children typically are paying FMRs.

Child-Related Characteristics

Exhibit 3 shows the descriptive statistics for the child-related variables, and the variable means across household groups are statistically significant (.01) for nearly every variable.[8] As discussed earlier in this article, the child-related characteristics are as follows: "infant" refers to a child ages 0–3, "toddler" refers to a child ages 4–5, "young child" refers to a child ages 6–12, and "teenager" refers to a child ages 13–17.

Overall, each household has about two children. Of the households in the study, 50 percent have one or more infants (ages 0–3), 50 percent have one or more young children (ages 6–12), 25 percent have toddlers (ages 4–5), and 25 percent have teenagers (ages 13–17). Also, about 10 percent of households have an infant and a male teenager, and an additional 10 percent have an infant and a female teenager.

Nonelderly heads of households with at least one disabled child differ from the other head-of-household types in several important ways. These heads of households are much more likely to have young children (67 percent) than are nonelderly heads of households with a child or children (50 percent) and nonelderly, disabled heads of households with a child or children (53 percent). Moreover, these head-of-household types are consistently more likely to have different child-group pairings, particularly pairings that include young children. For example, about 16 percent of nonelderly heads of households with at least one disabled child have an infant and a young male child and 15 percent of these households have an infant and a young female child, 5 to 10 percentage points above the corresponding rates in other head-of-household types.

Geographic Characteristics

Exhibit 4 provides the descriptive statistics for the geographic variables. Although statistically significant at the .01 or .05 level for most of these variables, the differences in means across head-of-household types are very small. Overall, households in the study are residing in areas

[7] Housing assistance payments distributed by HUD are limited by Fair Market Rents (FMRs) that are established by HUD. In the Housing Choice Voucher Program, the FMR is the basis for determining the "payment standard amount" used to calculate the maximum monthly subsidy for an assisted family. For more information, see HUD's Proposed Fair Market Rents for Fiscal Year 2008 for the Housing Choice Voucher Program and Moderate Rehabilitation Single Room Occupancy Program; Notice (Docket No. FR–5152–N–01), available at http://www.huduser.org/datasets/fmr/fmr2008p/fy2008p_preamble_complete.pdf.

[8] Because households can have multiple children in different age categories, the variables indicating the presence of children in different age groups, such as Kids03, Kids45, Kids612, and Kids1317, are not mutually exclusive. Expressed differently, the households can be observed in multiple child-age groupings.

Exhibit 3

Descriptive Statistics for Households in the HCVP, Child-Related Variables

Variable	Child-Related Characteristics	All Households		Nonelderly Heads of Households With a Child or Children		Nonelderly, Disabled Heads of Households With a Child or Children		Nonelderly Heads of Households With at Least One Disabled Child		Test of Difference in Means Across Groups
		Mean	Stdev	Mean	Stdev	Mean	Stdev	Mean	Stdev	
		(number)								
nKids	Number of children in household	2.04	1.13	2.05	1.12	1.87	1.10	2.56	1.32	***
		(percent)								
Kids03[a]	Presence in household of infants ages 0–3	50	50	54	50	31	46	47	50	***
Kids45[a]	Presence in household of toddlers ages 4–5	26	44	27	45	18	39	32	47	***
Kids612[a]	Presence in household of young children ages 6–12	51	50	50	50	53	50	67	47	***
Kids1317[a]	Presence in household of teenagers ages 13–17	26	44	23	42	41	49	30	46	***
Kids03*Kids612m	Presence in household of infants ages 0–3 and male young children ages 6–12	10	30	10	30	6	25	16	37	***
Kids03*Kids612f	Presence in household of infants ages 0–3 and female young children ages 6–12	10	30	10	30	7	25	15	36	***
Kids03*Kids1317m	Presence in household of infants ages 0–3 and male teenagers ages 13–17	2	14	2	14	2	15	4	19	***
Kids03*Kids1317f	Presence in household of infants ages 0–3 and female teenagers ages 13–17	3	17	3	17	3	17	5	22	***
Kids45*Kids612m	Presence in household of toddlers ages 4–5 and male young children ages 6–12	8	27	8	2	6	23	13	34	***
Kids45*Kids612f	Presence in household of toddlers ages 4–5 and female young children ages 6–12	8	27	8	27	6	24	12	32	***
Kids45*Kids1317m	Presence in household of toddlers ages 4–5 and male teenagers ages 13–17	2	13	2	12	2	13	3	17	***
Kids45*Kids1317f	Presence in household of toddlers ages 4–5 and female teenagers ages 13–17	2	13	2	13	2	12	2	16	*
		(number)								
Number of households		759,557		637,772		95,906		25,879		

HCVP = Housing Choice Voucher Program. Stdev = standard deviation.

[a] These age categories are not mutually exclusive—households may appear in one or more categories—and thus the percentages may not total 100 percent.

*Notes: *** significance at the 1-percent level; ** significance at the 5-percent level; * significance at the 10-percent level.*

Exhibit 4

Descriptive Statistics for Households in the HCVP, Location Variables, 2000

Variable	Location Characteristics	All Households		Nonelderly Heads of Households With a Child or Children		Nonelderly, Disabled Heads of Households With a Child or Children		Nonelderly Heads of Households With at Least One Disabled Child		Test of Difference in Means Across Groups
		Mean	Stdev	Mean	Stdev	Mean	Stdev	Mean	Stdev	
		(percent)								
Vacancy	Metropolitan area rental vacancy rate, 2000	9	6	9	6	9	6	9	7	*
		(number)								
Lihtc	Number of LIHTC units in census tract, 2000	119	139	120	137	113	142	125	165	
		(percent)								
Unemp	Metropolitan area unemployment rate	6	2	6	2	6	2	6	2	***
OwnOcc	Metropolitan area owner-occupancy rate	53	21	53	21	54	21	51	22	***
City	Household located in central city	49	50	49	50	49	50	53	50	**
Suburb	Household located in suburban area	30	46	30	46	30	46	31	46	
Rural	Household located in rural or nonmetropolitan area	21	41	21	41	22	41	16	37	***
PovRate	Metropolitan area poverty rate	20	12	20	12	20	12	22	13	***
NEglnd	In the New England census division	6	23	6	23	7	25	5	22	**
MAtlntc	In the Middle Atlantic census division	12	33	12	33	12	33	14	35	
ENCetrl	In the East North Central census division	15	36	15	35	17	37	16	37	***
WNCetrl	In the West North Central census division	9	28	9	29	7	25	6	23	***
SAtlntc	In the South Atlantic census division	16	37	16	37	16	37	18	38	
ESCetrl	In the East South Central census division	7	26	7	26	8	27	8	27	**
WSCetrl	In the West South Central census division	15	36	15	36	12	33	15	36	***
Mtn	In the Mountain census division	6	23	5	23	6	25	4	20	***
Pac	In the Pacific census division	14	35	14	35	15	36	14	34	
		(number)								
Number of households		759,557		637,772		95,906		25,879		

HCVP = Housing Choice Voucher Program. LIHTC = low-income housing tax credit. Stdev = standard deviation.

*Notes: *** significance at the 1-percent level; ** significance at the 5-percent level; * significance at the 10-percent level.*

with similar characteristics: moderate-poverty neighborhoods (20-percent poverty rate) that are typically located in central cities (49 percent) and have a fair number of LIHTC units (119 units). These neighborhoods are in metropolitan areas with 9-percent vacancy rates, 6-percent unemployment rates, and 53-percent owner-occupied units, on average. Households are geographically distributed, much like the national population, with larger concentrations of households in the South and West.

Descriptive Analysis by Exit Status

Exhibit A-1 in appendix A presents the household, child-related, and geographic characteristics separately for households that exited the HCVP and for households that never exited (that is, stayers) during the study period (1997 to 2004). Nearly all of the characteristics associated with exiters and stayers are statistically different at the .01 level, and a few merit particular attention.

- **Race.** Exiters are substantially more likely to be non-Hispanic Whites compared with stayers. About 47 percent of exiters are non-Hispanic Whites, and 28 percent of stayers are non-Hispanic Whites. In particular, African Americans constitute a large proportion of stayers (53 percent) but a much smaller proportion of exiters (37 percent).
- **Gender.** Although most households in the study are headed by females, stayers have more female heads of household than exiters have. About 88 percent of exiters are households headed by females, compared with 93 percent of stayers.
- **Income.** Both exiters and stayers are highly disadvantaged economically. Interestingly, exiters have slightly lower total income and wage income compared with stayers. The average annual income among exiters is about $10,050, and more than half of that amount ($5,573) is from wage income. In contrast, the average annual income among stayers is about $10,789, and about $6,121 is associated with wage income.
- **Number of Children.** Exiters have slightly fewer children than stayers. Exiters average fewer than two children per household, whereas stayers have more than two children per household.
- **Age of Children.** Exiters are more likely to have teenagers than are stayers, and stayers are more likely to have infants, toddlers, and young children. Stayers are also slightly more likely to have different types of child pairings. For example, 2 percent of stayers have both toddlers and teenagers together in the household compared with 1 percent of exiters.
- **Vacancy Rates.** Exiters are more likely to reside in metropolitan areas with larger vacancy rates than are stayers. The vacancy rate among households that exited the HCVP is about 9.2 percent compared with 8.6 percent among stayers.
- **Central City Location.** Exiters are less likely to live in central cities (43 percent) compared with stayers (56 percent).
- **Poverty Rate.** Although both exiters and stayers live in poor neighborhoods, exiters lived in neighborhoods with poverty rates that are about 2 percentage points lower than those of stayers. The neighborhood poverty rate among exiters is 19 percent compared with 21 percent among stayers.

Duration of Assistance and Exit Rates by Head-of-Household Type

Exhibit 5 presents the length of program stays (in years) by head-of-household type, and exhibit 6 provides survival curves for each head-of-household type. To account for censoring of the data that occurs when household records are observed for differing amounts of time, we use the Kaplan-Meier product-limit method to estimate lengths of stay and graph the survival curves (Kaplan and Meier, 1958). For example, a household that entered in 1997 can be observed for up to 8 years, but a household that entered in 2003 is observed for only 2 years.

The median length of stay for all households in the HCVP is nearly 3 years, with substantially longer stays for households with at least one disabled child than for other households. The median length of stay among nonelderly heads of households with a child or children is about 2.8 years, which is nearly two-thirds of the median (4.4 years) associated with nonelderly heads of households with at least one disabled child.

Exhibit 6 graphically displays survival curves for each head-of-household type. Each line represents the fraction of households that had not yet exited from the HCVP at successive lengths of stay after the point of original entry. The statistic (log-rank test) that tests for equality of survival functions indicates that the survival curves associated with the three head-of-household types are significantly different (.01 level). The log-rank test statistic compares the observed number of exits from the HCVP with the number expected in each head-of-household type under the null hypothesis of no survival difference among the three head-of-household types.

Both nonelderly heads of households with a child or children and nonelderly, disabled heads of households with a child or children experience a substantial fall in program participation after the first year in the HCVP. Fewer than 90 percent of those households remain in the program for 1 year. By the second year since program entry, only about 60 percent of those head-of-household types remain in the program. For both of those head-of-household types, the proportion remaining in the program steadily decreases over time, and the rate of decrease is slightly larger for nonelderly heads of households with a child or children. Fewer than 20 percent of those head-of-household types remain in the HCVP by the ninth year since program entry.

In contrast, the slope of the curve associated with nonelderly heads of households with at least one disabled child is less steep, particularly between the first and third years since program entry.

Exhibit 5

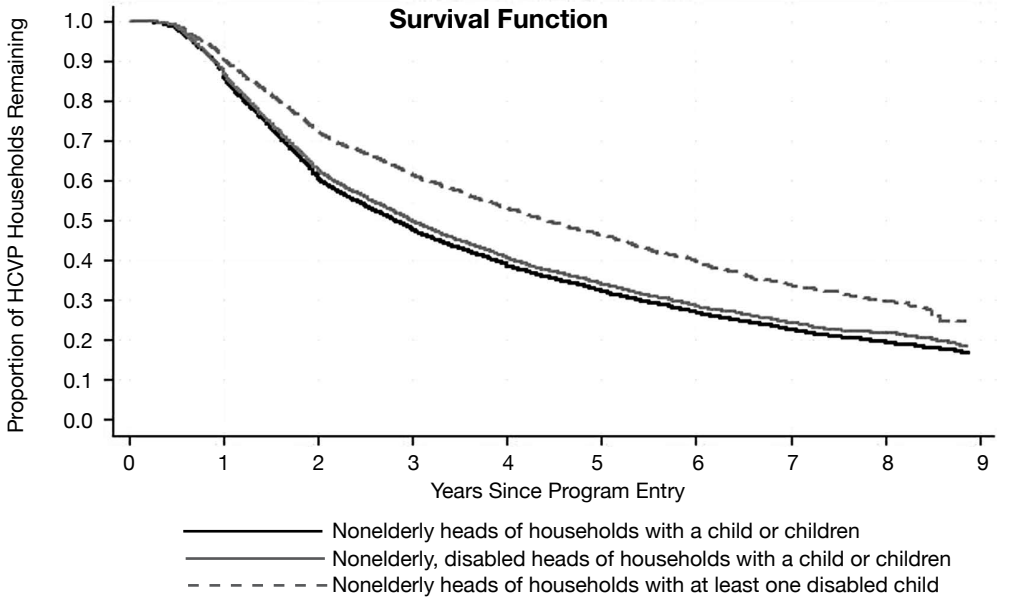
Length of Program Stay (in Years) in the HCVP by Head-of-Household Type, 1997–2004 Entering Cohorts

Percentile	All Households	Nonelderly Heads of Households With a Child or Children	Nonelderly, Disabled Heads of Households With a Child or Children	Nonelderly Heads of Households With at Least One Disabled Child
25th	1.45	1.44	1.47	1.87
50th	2.89	2.83	3.00	4.40
75th	6.58	6.44	6.84	8.59

HCVP = Housing Choice Voucher Program.

Exhibit 6

Survival Function by Head-of-Household Type



HCVP = Housing Choice Voucher Program.

About 90 percent of these households remain in the HCVP after 1 year since program entry, 71 percent remain after 2 years since program entry, and around 60 percent are receiving housing assistance after 3 years since program entry. Approximately one-quarter of the households remain in the HCVP after 9 years since program entry.

The survival curves suggest that many households exit after the first year of program participation, but the curves do not disaggregate the exit rates by entry cohort. For example, households that entered before 1998 (the year QHWRA was passed) may exit at different rates than households that entered more recently.

Exhibit 7 shows the cumulative exit rates by year of entry and years since entry for each head-of-household type, 1997–2004. Although very few households exit the program after 1 year of participation, a dramatic increase in exit rates is noticeable as participants stay in the HCVP for longer periods of time.

For example, among nonelderly heads of households with a child or children who entered in 1997, only 1 percent exited after 1 year of participation, but 43 percent exited by the second year of participation (a 42-percentage-point increase). The cumulative exit rate continues to increase with each additional year in the program, although the magnitude of the increases tapers gradually from 19 percentage points between years 2 and 3 to about 2 percentage points between years 7 and 8. By the eighth year of program participation, 84 percent of nonelderly heads of households with a child or children who entered in 1997 have exited from the program. Similar trends are

Exhibit 7

Cumulative Exit Rates in the HCVP by Year of Entry and Years Since Entry for Each Head-of-Household Type, 1997–2004

	Year of Entry							
	1997	**1998**	**1999**	**2000**	**2001**	**2002**	**2003**	**2004**
Nonelderly heads of households with a child or children								
Number of years since entry				(percent)				
1	1.0	1.1	2.5	2.1	2.8	1.4	1.4	1.4
2	43.0	41.7	37.4	29.6	36.6	24.3	25.0	
3	62.1	59.3	52.8	49.5	50.5	40.6		
4	72.2	68.0	65.7	60.0	60.6			
5	78.2	75.7	72.5	67.9				
6	83.4	80.2	77.7					
7	86.4	83.7						
8	88.8							
Total				(number)				
households	75,415	72,460	70,495	70,516	105,921	92,271	87,389	63,305
Nonelderly, disabled heads of households with a child or children								
Number of years since entry				(percent)				
1	0.4	0.5	1.6	1.3	1.5	1.0	1.1	1.2
2	33.1	36.2	32.7	26.9	33.2	25.8	27.0	
3	51.2	52.8	48.1	46.0	47.5	43.5		
4	62.7	62.4	61.2	57.6	59.0			
5	69.3	71.4	69.2	66.7				
6	76.0	76.6	75.2					
7	80.2	81.2						
8	83.8							
Total				(number)				
households	11,966	11,353	12,034	11,119	15,395	13,292	12,237	8,510
Nonelderly heads of households with at least one disabled child								
Number of years since entry				(percent)				
1	0.4	0.8	1.8	1.1	1.6	0.9	0.9	1.1
2	30.8	26.8	25.6	19.3	22.5	16.6	19.3	
3	46.4	40.7	37.7	33.5	33.6	30.2		
4	56.9	49.6	48.3	44.0	43.3			
5	64.1	57.8	55.8	53.2				
6	70.5	64.0	63.6					
7	74.7	68.9						
8	78.6							
Total				(number)				
households	2,933	2,772	2,831	2,976	4,504	3,717	3,470	2,676

HCVP = Housing Choice Voucher Program.

observed for other head-of-household types and entry cohorts, although nonelderly heads of households with a child or children have the highest exit rates for each year of participation and nonelderly heads of households with at least one disabled child have the lowest exit rates for each year of participation; nonetheless, these findings are consistent with Freeman's (2005) conclusions that the likelihood of exiting housing assistance is highest in the earliest years of an assisted housing stay. These findings also suggest that most households with a child or children, including households with a nonelderly, disabled head of household or at least one disabled child, are not long-term users of the HCVP.

Exit rates diminish steadily across entry cohorts, except for a slight increase in exit rates among households that entered in 2001. For example, although 31 percent of nonelderly heads of households with at least one disabled child that entered in 1997 exited after 2 years of program participation, only 19 percent of households that entered in 2003 exited after 2 years in the program. Similarly, 57 percent of nonelderly heads of households with at least one disabled child that entered in 1997 exited after 4 years of program participation, but only 43 percent of households that entered in 2001 exited after 4 years in the program. These trends are observed for all head-of-household types. Thus, cohorts that entered recently are less likely to exit the program when compared with older entry cohorts. This finding may be associated with tighter housing markets over time and fewer affordable housing options. It may also suggest that the characteristics of more recent cohorts are different from those of older cohorts, and these differences are related to longer lengths of stay in the HCVP.

Exhibit 8 focuses on the composition of households entering the HCVP with children of different ages by entering cohort, and evidence suggests that more recent cohorts are different from past cohorts. The proportion of households with infants has steadily increased across entry cohorts, from about 46 percent in 1997 to 54 percent in 2004 (or an 8-percentage-point increase). The

Exhibit 8

Percentage of Households Entering the HCVP With Children of Different Ages, by Entering Cohort

Household Type[a]	Entering Cohort							
	1997	1998	1999	2000	2001	2002	2003	2004
	(percent)							
Households with infants ages 0–3	45.9	47.1	49.2	51.6	51.3	52.1	51.8	53.5
Households with toddlers ages 4–5	28.1	28.9	27.6	26.0	26.5	25.3	26.2	26.8
Households with young children ages 6–12	55.2	53.4	52.7	51.3	50.3	49.4	49.4	48.0
Households with teenagers ages 13–17	27.3	27.3	24.9	23.7	24.9	25.0	26.6	24.9
	(number)							
Total households	90,314	86,585	85,360	84,611	125,820	109,280	103,096	74,491

HCVP = Housing Choice Voucher Program.

[a] Household types are not mutually exclusive—households may be observed in more than one household type—and thus the column percentages may not total 100 percent.

increase in the proportion of households with infants has occurred simultaneously with a decrease in households with children of other ages, especially households with young children ages 6–12. From 1997 to 2004, the proportion of households with children in this age group decreased by about 7 percentage points.

Changes in the proportion of households with children of different age groups entering the HCVP could influence exit rates from the program if the presence of children of different ages is associated with program exits. The results from the multivariate analysis address this relationship.

Results From the Multivariate Analysis

Exhibits 9 and 10 show the results from the piecewise-exponential duration models.[9] Exhibit 9 provides the estimates from the first model, which includes dummy variables for the presence of children in different age groups and genders, and an array of household and location characteristics. Exhibit 10 summarizes the results from the full model, which include the various household and location characteristics, the child-dummy variables from the first model, and the series of child-interaction terms. All the estimates from the full model appear in exhibit B-1 in appendix B.

The results reported in exhibit 9 are consistent with previous research on the effect of household and location characteristics on attrition rates. Among all household types, several of the following household and location characteristics are associated with lengths of stay in the HCVP:

- **Race.** African-American households have lengths of stay in the HCVP that are 51 percent longer than those of White households (the omitted reference category), and Hispanics have lengths of stay that are 28 percent longer than those of Whites. The longer lengths of stay associated with minorities are observed across all household types, although the effect on nonelderly, disabled heads of households with a child or children is less severe. Nonelderly, disabled heads of households who are African American and have a child or children stay about 27 percent longer than White, nonelderly disabled heads of households with a child or children.
- **Gender.** Households headed by females have lengths of stay that are 18 percent longer than households headed by males. The effect of gender on length of stay is consistent across all household types.
- **Homeless Status.** The expected length of stay among people who were previously homeless is about 3 percent shorter than the length of stay among people who were previously not homeless.
- **Income.** Among all household types, a $1,000 increase in annual income is associated with a 1-percent decrease in a household's length of stay in the program. The effect of income on length of stay is more pronounced among nonelderly heads of households with at least one disabled child. For these households, a $1,000 increase in annual income is associated with a 3-percent decrease in length of stay. Wage income had a marginal effect on length of stay.

[9] Because all household records were used in the analysis, even small differences in the estimates will be statistically significant; thus, it is important to focus on the size of the estimates.

Exhibit 9

Estimates From the Piecewise-Exponential Duration Model With Child-Dummy Variables

Variable	Characteristics	All Households		Nonelderly Heads of Households With a Child or Children		Nonelderly, Disabled Heads of Households With a Child or Children		Nonelderly Heads of Households With at Least One Disabled Child	
		Coeff.	Time Ratio	Coeff.	Time Ratio	Coeff.	Time Ratio	Coeff.	Time Ratio
Panel A: Household Characteristics									
AgeHH	Age of household head	– 0.0048	0.9952 ***	– 0.0015	0.9985 **	– 0.0107	0.9893 ***	– 0.0009	0.9991
FamSize	Total number of people in the household	– 0.0742	0.9284 ***	– 0.0784	0.9246 ***	– 0.0597	0.9420 ***	– 0.1215	0.8856 **
Adult1824	Presence in household of adults ages 18–24	– 0.0459	0.9551 *	– 0.0368	0.9639 ***	– 0.0564	0.9452 *	0.0952	1.0999
Adult2534	Presence in household of adults ages 25–34	– 0.0103	0.9897	– 0.0151	0.9850	– 0.0387	0.9620	0.1112	1.1176
Adult35p	Presence in household of adults ages 35 and older	0.0562	1.0578 ***	0.0264	1.0268	0.0706	1.0731 **	0.0499	1.0511
Black	Head of household is non-Hispanic African American	0.4139	1.5126 ***	0.4391	1.5514 ***	0.2391	1.2700 ***	0.4398	1.5524 ***
Hispanic	Head of household is Hispanic	0.2530	1.2879 ***	0.2583	1.2947 ***	0.2522	1.2869 ***	0.2936	1.3412 ***
Other	Head of household is other race	0.1761	1.1925 ***	0.1572	1.1703 ***	0.2818	1.3255 ***	0.1944	1.2145
Female	Head of household is female	0.1661	1.1807 ***	0.1704	1.1858 ***	0.1585	1.1717 ***	0.1862	1.2047 ***
Homeless	Head of household was previously homeless	– 0.0311	0.9694 *	– 0.0320	0.9685 *	– 0.1250	0.8825 ***	0.2140	1.2386 *
Income[a]	Total household annual income	– 0.0093	0.9908 ***	– 0.0051	0.9949 ***	– 0.0155	0.9846 ***	– 0.0298	0.9707 ***
Wage[a]	Total household wage income	0.0060	1.0061 ***	0.0023	1.0023 ***	0.0164	1.0166 ***	0.0320	1.0325 ***
H2	Nonelderly, disabled head of household with a child or children	0.1741	1.1902 ***						
H3	Nonelderly head of household with at least one disabled child	0.2403	1.2716 ***						

Exhibit 9

Estimates From the Piecewise-Exponential Duration Model With Child-Dummy Variables (continued)

Variable	Characteristics	All Households		Nonelderly Heads of Households With a Child or Children		Nonelderly, Disabled Heads of Households With a Child or Children		Nonelderly Heads of Households With at Least One Disabled Child	
		Coeff.	Time Ratio	Coeff.	Time Ratio	Coeff.	Time Ratio	Coeff.	Time Ratio
Panel B: Child-Related Characteristics									
nKids	Number of children in household	0.0912	1.0954 ***	0.0979	1.1028 ***	0.0280	1.0284	0.1128	1.1195 *
Kids03	Presence in household of infants ages 0–3	0.0942	1.0988 ***	0.0941	1.0986 ***	0.1498	1.1616 ***	0.1770	1.1937 ***
Kids45	Presence in household of toddlers ages 4–5	0.0855	1.0893 ***	0.0744	1.0772 ***	0.2003	1.2217 ***	0.1247	1.1328 **
Kids612m	Presence in household of male young children ages 6–12	0.1030	1.1085 ***	0.0860	1.0898 ***	0.2395	1.2706 ***	0.1073	1.1133 **
Kids612f	Presence in household of female young children ages 6–12	0.1117	1.1182 ***	0.0932	1.0977 ***	0.2555	1.2911 ***	0.1106	1.1170 **
Kids1317m	Presence in household of male teenagers ages 13–17	– 0.0353	0.9654 ***	– 0.0389	0.9618 ***	0.0261	1.0264	– 0.0500	0.9512 **
Kids1317f	Presence in household of female teenagers ages 13–17	– 0.0307	0.9698 ***	– 0.0381	0.9626 ***	0.0365	1.0371	– 0.0366	0.9641

Exhibit 9

Estimates From the Piecewise-Exponential Duration Model With Child-Dummy Variables (continued)

Variable	Characteristics	All Households		Nonelderly Heads of Households With a Child or Children		Nonelderly, Disabled Heads of Households With a Child or Children		Nonelderly Heads of Households With at Least One Disabled Child	
		Coeff.	Time Ratio	Coeff.	Time Ratio	Coeff.	Time Ratio	Coeff.	Time Ratio
Panel C: Location Characteristics									
Lihtc[b]	Number of LIHTC units in census tract	0.0051	1.0051 *	0.0065	1.0066 **	– 0.0089	0.9912	0.0288	1.0293 *
Unemp	Metropolitan area unemployment rate, 2000	– 2.2991	0.1003 ***	– 2.6280	0.0722 ***	– 0.3878	0.6785	1.8120	6.1225
Vacancy	Metropolitan area rental vacancy rate, 2000	– 0.6362	0.5293 ***	– 0.6322	0.5314 ***	– 0.5756	0.5624 ***	– 0.6707	0.5113 ***
City	Household located in central city	0.0688	1.0712 ***	0.0736	1.0764 ***	0.0270	1.0274	0.0732	1.0760 *
Rural	Household located in rural or nonmetropolitan area	– 0.2592	0.7717 ***	– 0.2657	0.7666 ***	– 0.2002	0.8185 ***	– 0.2973	0.7428 ***
NEgInd	In the New England census division	0.1566	1.1695 ***	0.1589	1.1722 ***	0.1809	1.1982 ***	0.0484	1.0495
MAtlntc	In the Middle Atlantic census division	0.1323	1.1414 ***	0.1417	1.1522 ***	0.0952	1.0999 ***	0.0016	1.0016
ENCetrl	In the East North Central census division	– 0.1159	0.8905 ***	– 0.1164	0.8902 ***	– 0.0672	0.9350 **	– 0.1541	0.8572 **
WNCetrl	In the West North Central census division	– 0.2872	0.7503 ***	– 0.2943	0.7451 ***	– 0.1684	0.8450 ***	– 0.3837	0.6814 ***
SAtlntc	In the South Atlantic census division	– 0.1514	0.8595 ***	– 0.1518	0.8592 ***	– 0.1168	0.8898 ***	– 0.1626	0.8500 *
ESCetrl	In the East South Central census division	– 0.2073	0.8127 ***	– 0.2036	0.8158 ***	– 0.1629	0.8497 ***	– 0.4109	0.6630 ***
WSCetrl	In the West South Central census division	– 0.3030	0.7386 ***	– 0.3070	0.7356 ***	– 0.2010	0.8179 ***	– 0.3389	0.7126 ***
Mtn	In the Mountain census division	– 0.1588	0.8531 ***	– 0.1631	0.8495 ***	– 0.0604	0.9414	– 0.3857	0.6800 ***
Number of households		759,557		637,772		95,906		25,879	

Coeff. = coefficient. LIHTC = low-income housing tax credit.

[a] For the piecewise-exponential duration model, the income and wage variables were adjusted (divided) by a factor of 1,000.

[b] For the piecewise-exponential duration model, the LIHTC variable was adjusted (divided) by a factor of 100.

*Notes: *** significance at the 1-percent level; ** significance at the 5-percent level; * significance at the 10-percent level.*

- **Household Type.** Nonelderly, disabled heads of households with a child or children and nonelderly heads of households with at least one disabled child stay 19 and 27 percent longer, respectively, than nonelderly heads of households with a child or children stay.
- **Central-City Location.** Households in central cities stay 7 percent longer than households in suburban jurisdictions (the omitted reference category). The effect of urban location on length of stay is consistent across all household types, although the longer length of stay in the HCVP for households in central cities is less pronounced among nonelderly, disabled heads of households with a child or children.
- **Census Division.** Households in the New England and Middle Atlantic census divisions stay 16 and 14 percent longer, respectively, compared with households in the Pacific division (the omitted reference category). The effect of census division on length of stay is consistent across all household types.

The presence of children is associated strongly with lengths of stay in the HCVP, after controlling for an array of household and location characteristics, as shown in exhibit 9.

- **Number of Children.** Among all households, each additional child in a household is associated with a 10-percent increase in the household's expected length of stay. This effect is observed across all head-of-household types, although it is less pronounced among nonelderly, disabled heads of households with a child or children.
- **Infants (ages 0–3).** The presence of infants in a household increases lengths of stay among all households by about 10 percent when compared with households without the presence of infants. The effect of the presence of infants on lengths of stay is greater among nonelderly, disabled heads of households with a child or children (16 percent longer) and nonelderly heads of households with at least one disabled child (19 percent longer).
- **Toddlers (ages 4–5).** Among all households, the presence of toddlers increases lengths of stay by about 9 percent when compared with households without toddlers. The effect of toddlers on lengths of stay is especially pronounced among nonelderly, disabled heads of households with a child or children (22 percent longer).
- **Young Children (ages 6–12).** The presence of young children, regardless of gender, has large effects on lengths of stay in the program. Households with young female children stay about 12 percent longer than households without these children, and households with young male children show a similar effect on lengths of stay (about 11 percent longer). The effect of young children (male and female) on lengths of stay is especially acute for nonelderly, disabled heads of households with a child or children; those households have expected lengths of stay that are 27 and 29 percent longer than those of similar households without these children.
- **Teenagers (ages 13–17).** The presence of male or female teenagers in a household lowers expected lengths of stay by about 3 percent for most head-of-household types. The effect of teenagers on lengths of stay is again significantly different for nonelderly, disabled heads of households with a child or children; those households stay for about 3 percent longer than similar households without teenagers.

These results suggest that lengths of stay in the program are modestly longer when households include the presence of children under age 13 and are slightly shorter when they include teenagers. The results also indicate that these effects are more pronounced among nonelderly, disabled heads of households with a child or children. Depending on the severity of the disability, disabled heads of household may not have many opportunities for gainful employment, and many have fixed incomes from mainstream income supports, such as Supplemental Security Income. The presence of children in these head-of-household types may put further strain on household finances and, thus, limit the household's ability to pay rent in the private market, which can lead to longer lengths of stay in the HCVP.

Exhibit 10 summarizes key results indicating how relative survival times (or lengths of stay) for households with the presence of infants and toddlers change when households also include older children in varying ages and gender groups. The first column repeats the estimated overall effect of infants and toddlers from exhibit 9. The second column shows the *ratio of effects* of infants and toddlers when older children of various ages and genders also are present in the household. As noted earlier, we estimated the latter ratios by adding interactions between the infant and toddler dummy variables and the dummy variables for each of the other age-gender groups. (See exhibit B-1 for full results from this model.)

For example, row 1, column 2 shows that average lengths of stay are 10 percent longer overall in households with the presence of an infant compared with those without an infant. Column 4 shows that this effect is slightly lower (5 percent) in households that also have the presence of a male young child age 6–12 than in those that do not, and column 5 indicates that the difference is statistically significant. Findings in the first panel of exhibit 10 apply to all household types and suggest the following relationships:

- The presence of young children ages 6–12 in the same household with an infant or a toddler attenuates slightly the effect that infants and toddlers have on lengths of time in the program. The effects are somewhat larger for toddlers (about .90 to .91) than for infants (.95 to .97) and are about the same for male and female young children ages 6–12.
- The presence of teenagers, especially male teenagers, magnifies the lengthening of stays associated with infants and toddlers. For example, when a male teenager is present, the ratio of length of stay associated with an infant is 1.09 times larger than when no male teenager is present, and the ratio of length of stay for a toddler is 1.15 times larger.
- Effects are multiplicative; the presence of older boys and girls from multiple categories would have an even larger combined effect. For example, the increased length of stay associated with the presence of a toddler ages 4–5 is .90 * .90 = .81 times lower when households include both male and female young children ages 6–12.

The results for all households suggest that the presence of young children or teenagers in the same household with infants and toddlers affects the lengths of stay in the program. The descriptive statistics in exhibit 3 indicate that more households in the HCVP have an infant or a toddler and a young child than households with an infant or a toddler and a teenager. The lower prevalence of teenagers in households with infants or toddlers across all voucher households substantially constrains the negative effects of teenagers.

Exhibit 10

Summary of Child-Related Interaction Effects on Lengths of Stay in the HCVP

Overall Effect of Infant and Toddler[a]		Ratio of Effects of Infant and Toddler When Household Does and Does Not Include at Least One Older Child in Specified Age-Sex Groups		T-test
All households				
Infant ages 0–3	+ 10%***	Male young child ages 6–12	.95	***
		Female young child ages 6–12	.97	***
		Male teenager ages 13–17	1.09	***
		Female teenager ages 13–17	.98	
Toddler ages 4–5	+ 9%***	Male young child ages 6–12	.91	***
		Female young child ages 6–12	.90	***
		Male teenager ages 13–17	1.15	***
		Female teenager ages 13–17	1.06	**
Nonelderly heads of households with a child or children				
Infant ages 0–3	+ 10%***	Male young child ages 6–12	.97	***
		Female young child ages 6–12	.97	***
		Male teenager ages 13–17	1.06	***
		Female teenager ages 13–17	.98	***
Toddler ages 4–5	+ 8%***	Male young child ages 6–12	.93	***
		Female young child ages 6–12	.91	***
		Male teenager ages 13–17	1.14	***
		Female teenager ages 13–17	1.05	***
Nonelderly, disabled heads of households with a child or children				
Infant ages 0–3	+ 16%***	Male young child ages 6–12	.84	***
		Female young child ages 6–12	.93	*
		Male teenager ages 13–17	1.13	*
		Female teenager ages 13–17	1.01	
Toddler ages 4–5	+ 22%***	Male young child ages 6–12	.79	***
		Female young child ages 6–12	.84	***
		Male teenager ages 13–17	1.19	**
		Female teenager ages 13–17	1.10	
Nonelderly heads of households with at least one disabled child				
Infant ages 0–3	+ 19%***	Male young child ages 6–12	.90	*
		Female young child ages 6–12	.99	
		Male teenager ages 13–17	1.38	***
		Female teenager ages 13–17	.91	
Toddler ages 4–5	+ 13%***	Male young child ages 6–12	.80	***
		Female young child ages 6–12	.94	
		Male teenager ages 13–17	1.12	
		Female teenager ages 13–17	1.10	

HCVP = Housing Choice Voucher Program.

[a] The overall effect of an infant or a toddler is equal to the time ratios reported in exhibit 9.

*Notes: *** significance at the 1-percent level; ** significance at the 5-percent level; * significance at the 10-percent level.*

Findings in the remaining panels of exhibit 10, which apply to the three head-of-household types in the study, suggest the following conclusions:

- The effects of child-pairings on nonelderly, disabled heads of households with a child or children are consistently more pronounced in comparison with the other household types. For example, the effects associated with infants ages 0–3 and male young children ages 6–12 (.84) or with infants ages 0–3 and female young children ages 6–12 (.93) are larger than those associated with nonelderly heads of households with a child or children (.97 for both genders) and nonelderly heads of households with at least one disabled child (.90 and .99, respectively). Also, nonelderly, disabled heads of households with a child or children are the only households in the study to show negative effects from a female teenager with an infant (1.01).
- The effect of male teenagers on lengths of stay is most severe among infants in a household with a nonelderly head of household with at least one disabled child. When a male teenager is present in these head-of-household types, the ratio of lengths of stay associated with an infant is 1.38 times larger than when no male teenager is present.
- The multiplicative effect associated with households that include both male and female young children ages 6–12 is greatest in households with nonelderly, disabled heads of households with a child or children. For these head-of-household types, the increased length of stay associated with the presence of toddlers ages 4–5 is .79 * .84 = .66 times lower when households include both male and female young children ages 6–12.

These results raise interesting questions about the relationship between household composition and the ability of single heads of households to exit from the HCVP. Why do infants and toddlers lead to longer lengths of stay? Why do young children attenuate the effects associated with infants and toddlers on expected lengths of stay? And, finally, why do teenagers exacerbate the effects associated with infants and toddlers? In the absence of qualitative information about a household's decisionmaking process, answers to these questions are speculative.

As suggested earlier, the presence of infants and toddlers may lead some households to stay in the housing program until they can secure adequate daycare, which, in turn, provides an opportunity to find gainful employment. If those households are unable to find appropriate daycare for their infants or toddlers, then longer lengths of stay would be expected.

Reasons for the attenuating effects of young children (ages 6–12) on household lengths of stay are less clear. Responsible young children may be asked to babysit for the younger children in the household while the head of the household is taking incremental steps to become self-sufficient (for example, enrolling in a job-training program, going to a job interview, or completing a certificate or degree program), but the head of the household may be limited in his or her ability to pursue different types of self-sufficiency opportunities. For example, the head of a household may not feel comfortable leaving a young child with an infant or a toddler while the household head is working full time, but perhaps the household head does feel comfortable leaving the children while he or she attends a 2-hour General Educational Development (GED) class. The head of household potentially could become self-sufficient more quickly by attending GED classes during the day and working in the evening, but responsibilities for the children prevent the household

head from pursuing these activities simultaneously. Thus, young children in the household may facilitate the ability of a household head to become self-sufficient to the extent that the household head can relinquish his or her responsibilities for a short time, but not enough to overcome the exit-delays associated with having infants and toddlers in the household.

In addition, the results do not support the hypothesis that teenagers—male or female—help a household become self-sufficient by allowing the head of household to leave the infants or toddlers with the teenager and find gainful employment. On the contrary, the presence of teenagers, especially male teenagers, magnifies the stay-lengthening effect of the presence of infants and toddlers. Perhaps some households with at-risk teenagers are overwhelmed by the stresses brought on by the teenager, and, as a result, they decide to focus on stabilizing their household life before considering other important choices, such as seeking employment, asking for a raise, or uprooting the household and moving elsewhere. Or perhaps some households with teenagers prefer to keep their teenagers rooted in their social settings, and the housing assistance enables them to stay where they are. These hypotheses merit closer study and could be the subject of future research.

The results also suggest that PHAs that have large concentrations of households with a child or children, especially households with infants or toddlers only or households with infants, toddlers, and teenagers, should expect longer lengths of stay when compared with other household types. The longer lengths of stay in the program likely are affected by the location of PHAs because the results also suggest that location characteristics are associated with longer lengths of stay. Indeed, exhibit 11 shows the location and rent costs of PHAs in 2005 with the highest percentage of households with a child or children (under age 6)—weighted by the number of housing units—compared with other PHAs. PHAs with the highest percentage of households with young children are those whose proportion of households with young children is within the highest quartile among all PHAs. Also, households with infants and toddlers are defined as households with one or more children age 5 or younger.

We find a large concentration of PHA units with infants and toddlers (ages 5 or under) in central cities (56 percent), and about the same concentration for other areas (53 percent). Results shown in exhibit 9 suggest that households in central cities stay in the program about 7 percent longer than households in suburban jurisdictions, and, thus, the confluence of young children and central city locations is expected to lead to even longer lengths of stay. Few households participating in the HCVP (about 10 percent) are located in census divisions that were associated with longer lengths of stay; that is, the New England and Middle Atlantic divisions.

In addition, about one-quarter of PHA households participating in the HCVP reside in areas where the PHAs' average rent is more than the areas' FMRs. Past research suggests that higher cost areas are associated with longer lengths of stay (Susin, 1999), and increases in the monthly value of the local payment standard are also associated with lower rates of program exit (Olsen, Davis, and Carrillo, 2005). Although we were unable to control for local rent structures in the piecewise-exponential duration model because of multicollinearity issues, past research suggests that households in these higher cost markets are expected to stay in the program longer than households in lower cost markets.

Exhibit 11

Location and Rent Costs Among PHAs With the Highest Percentage of Households With Infants and Toddlers Compared With Other PHAs, 2005[a]

Characteristic	PHAs With Highest Percentage of Households With Young Children[b]	Other PHAs
Number of PHAs	604	1,816
Metropolitan location	(percent)	
Central city	56.2	53.4
Suburb	23.6	32.0
Nonmetropolitan area	20.2	14.7
Total	100.0	100.0
Census division		
New England	5.2	9.1
Middle Atlantic	4.5	18.8
East North Central	11.9	14.1
West North Central	8.8	6.5
South Atlantic	22.1	14.6
East South Central	10.8	4.4
West South Central	23.9	8.3
Mountain	5.5	5.1
Pacific	7.3	19.1
Total	100.0	100.0
Rent-to-FMR ratio[c]		
Average ratio	0.957	0.953
	(percent)	
> 1	25.5	23.0
1 to 0.85	68.2	69.2
0.85 to 0.75	6.1	7.3
< 0.75	0.2	0.5
Total	100.0	100.0

FMR = Fair Market Rent. PHA = public housing agency.

[a] The data in the table are weighted by number of housing units.

[b] PHAs with the highest percentage of households with young children are those whose proportion of households with young children is within the highest quartile among all PHAs. Households with infants and toddlers are defined as households with one or more children age 5 or younger.

[c] PHA data are aggregated to calculate mean gross rents each year, and mean rents among PHAs are compared with their respective metropolitan area's FMR to generate the rent-to-FMR ratio.

Conclusion

This study analyzed administrative data from HUD to explore the factors associated with a household's length of stay in the HCVP. Analyses summarize relationships between length of stay and various demographic, economic, and geographic characteristics of households. The study placed particular emphasis on differences in characteristics and program exit rates across three types of heads of households (nonelderly heads of households with a child or children; nonelderly,

disabled heads of households with a child or children; and nonelderly heads of households with at least one disabled child) and on the effect of the presence of children (and their number, ages, and spacing) on exit rates from the program.

Overall, we found that exit rates from the HCVP vary somewhat across head-of-household types. Households with a child or children have the highest rates of exit for each year of program participation, and nonelderly heads of households with at least one disabled child have the lowest rates of exit for each year of program participation. Exit rates by number of years of participation strongly suggest that most households with a child or children are not long-term participants in the HCVP. Half of all households exit the program after less than 3 years of program participation, and exit rates increase precipitously after 1 year of program participation. Depending on the head-of-household type and entry cohorts, as many as 43 percent of households exited the program by the second year of participation; however, exit rates diminish steadily across entry cohorts. Cohorts that entered recently are much less likely to exit the program after 1 or more years in the program when compared with cohorts who entered several years ago. This finding raises the possibility that characteristics related to a household's length of stay in the program may be somewhat different for cohorts who recently entered the program when compared with cohorts entering several years ago.

We also find that households with infants are increasingly common among new entrants in the HCVP. The proportion of households with infants has increased steadily across entry cohorts, which has occurred simultaneously with a decrease in households with children of other ages, particularly households with young children (ages 6–12). From 1997 to 2004, the proportion of households with young children at entry has decreased by about 7 percentage points. This finding is particularly important because the piecewise-exponential duration model suggests that the presence of children in a household strongly affects the household's expected length of stay in the HCVP.

The study's main findings on the effect of the presence of children in the household suggest that the presence of an infant or a toddler increases a household's length of stay in the HCVP, after data are controlled for an array of household and location characteristics. Moreover, the estimates associated with different-age child-pairings demonstrate that the presence of young children ages 6–12 in the same household that has infants and toddlers attenuates slightly the effect that infants and toddlers have on lengths of stay, and the effect is about the same for the presence of male and female young children ages 6–12. We also find that the presence of teenagers, especially male teenagers, magnifies the lengthening of stays associated with infants and toddlers, but the smaller proportion of households with teenagers and younger children in the study population constrains the negative effects of teenagers on lengths of stay. These findings are consistent across all household types, although the effects are particularly acute among nonelderly, disabled heads of households and nonelderly heads of households with at least one disabled child.

Overall, the study results have implications for policy decisions regarding the use of self-sufficiency programs, time limits on program participation, and tenant selection policies. The impetus for incorporating self-sufficiency programs into housing assistance programs is the belief that many participants are long-term program users who become dependent on government-subsidized housing. The study's results find little support for the notion that households, including households with a nonelderly, disabled head of household and households with at least one disabled child, stay

in the HCVP for long periods of time. On the contrary, about half of HCVP participants exited the program after 3 years of participation and about three-quarters exited after 6 years, although exit rates varied by entry cohort. These findings also suggest that time limits on program participation may be unnecessary.

The findings suggest that self-sufficiency programs that traditionally have focused on promoting positive outcomes among heads of households also should consider the needs of both infants or toddlers and teenagers. Access to adequate childcare among program participants may attenuate the effects that infants and toddlers have on lengths of stay if these services allow the head of household to seek employment, enroll in training or education, or otherwise become more self-sufficient. The need for adequate childcare has consistently been cited in research literature as a key barrier to households' self-sufficiency outcomes (Turnham et al., 2006). In addition, incorporating counseling services or after-school programs for at-risk teenagers may assuage the effects that teenagers (male or female) have on a household's length of stay in the program when younger children are present. These services may lessen the stress brought on by an at-risk teenager and help discipline the teenager, which, in turn, may allow the head of household to focus on other aspects of life, such as opportunities to become more self-sufficient.

The results also suggest that PHA policies may significantly affect lengths of stay among households with a child or children if the policies affect the characteristics of households entering the program. Evidence presented in this study suggests that recent entry cohorts are more likely to have infants or toddlers in the household and less likely to have older children, especially young children ages 6–12. This shift in household composition has occurred concomitantly with lower exit rates and longer expected lengths of stay among recent cohorts. This phenomenon raises several important questions about the forces that might be underpinning this shift. Are PHAs' tenant-selection preferences directly or indirectly promoting this shift? Is the management of waiting lists affecting the selection of applicants by age group of children in households and, thus, leading to longer lengths of stay in the program? Is the fungibility in income eligibility requirements between a PHA's public housing program and tenant-based HCVP resulting in a higher concentration of poor households (many with children) in the HCVP and, thus, leading to longer lengths of stay? Addressing these critical questions is fundamental to understanding how vouchers are used by program participants and how vouchers will turn over in the future.

Appendix A

Exhibit A-1

Descriptive Statistics for the Household Characteristic Variables, by Exit Status

Variable	Household Characteristics	Exiters		Stayers		Difference in Means Test
		Mean	Stdev	Mean	Stdev	
Panel A: Household Characteristics		(percent)				
AgeHH	Age of household head	31.23	9.29	30.81	8.59	***
FamSize	Total number of people in the household	3.19	1.22	3.28	1.26	***
Adult1824	Presence in household of adults ages 18–24	36	48	34	47	***
Adult2534	Presence in household of adults ages 25–34	41	49	44	50	***
Adult35p	Presence in household of adults ages 35 or older	34	48	32	46	***
White	Head of household is non-Hispanic White	47	50	28	45	***
Black	Head of household is non-Hispanic African American	37	48	53	50	***
Hispanic	Head of household is Hispanic	13	34	16	36	***
Other	Head of household is other race	3	18	3	17	***
Female	Head of household is female	88	33	93	26	***
nMarried	No spouse is present in household	88	32	92	27	***
Homeless	Head of household was previously homeless	3	17	4	20	***
		(US$)				
Income	Total household annual income	10,050	6,217	10,789	6,632	***
Asset	Total household asset amount	56	1,037	19	558	***
Wage	Total household wage income	5,573	7,229	6,121	7,816	***
		(percent)				
adjAMI	Household income in proportion to AMI	21	12	20	11	***
adjRent	Gross rent in proportion to FMR	102	173	100	17	***

Exhibit A-1

Descriptive Statistics for the Household Characteristic Variables, by Exit Status (continued)

Variable	Household Characteristics	Exiters		Stayers		Difference in Means Test
		Mean	Stdev	Mean	Stdev	
Panel B: Child-Related Characteristics						
nKids	Number of children in household	1.94	1.09	2.10	1.17	***
		(percent)				
Kids03	Presence in household of infants ages 0–3	50	50	51	50	***
Kids45	Presence in household of toddlers ages 4–5	24	43	28	45	***
Kids612m	Presence in household of male young children ages 6–12	34	61	41	65	***
Kids612f	Presence in household of female young children ages 6–12	35	61	41	65	***
Kids1317m	Presence in household of male teenagers ages 13–17	18	44	16	43	***
Kids1317f	Presence in household of female teenagers ages 13–17	19	45	17	44	***
Kids03*Kids612m	Presence in household of infants ages 0–3 and male young children ages 6–12	9	28	11	31	***
Kids03*Kids612f	Presence in household of infants ages 0–3 and female young children ages 6–12	8	28	11	32	***
Kids03*Kids1317m	Presence in household of infants ages 0–3 and male teenagers ages 13–17	2	14	2	16	***
Kids03*Kids1317f	Presence in household of infants ages 0–3 and female teenagers ages 13–17	3	17	3	17	*
Kids45*Kids612m	Presence in household of toddlers ages 4–5 and male young children ages 6–12	7	25	8	28	***
Kids45*Kids612f	Presence in household of toddlers ages 4–5 and female young children ages 6–12	7	25	8	27	***
Kids45*Kids1317m	Presence in household of toddlers ages 4–5 and male teenagers ages 13–17	1	11	2	13	***
Kids45*Kids1317f	Presence in household of toddlers ages 4–5 and female teenagers ages 13–17	1	12	2	14	***

Exhibit A-1

Descriptive Statistics for the Household Characteristic Variables, by Exit Status (continued)

Variable	Household Characteristics	Exiters		Stayers		Difference in Means Test
		Mean	Stdev	Mean	Stdev	
Panel C: Location Characteristics		(percent)				
Vacancy	Metropolitan area rental vacancy rate, 2000	9.2	6.4	8.6	6.2	***
Lihtc	Number of LIHTC units in census tract	39.63	93.91	46.47	108.99	***
		(percent)				
Unemp	Metropolitan area unemployment rate, 2000	6	2	6	1	***
OwnOcc	Metropolitan area owner-occupancy rate, 2000	56.4	19.8	50.5	22.1	***
City	Household located in central city	43	49	56	50	***
Suburb	Household located in suburban area	29	45	31	46	***
Rural	Household located in rural or nonmetropolitan area	29	45	13	34	***
PovRate	Metropolitan area poverty rate	19.1	11.3	21.0	12.6	***
NEgInd	In the New England census division	5	21	6	23	***
MAtlntc	In the Middle Atlantic census division	10	29	16	37	***
ENCetrl	In the East North Central census division	14	35	15	36	***
WNCetrl	In the West North Central census division	11	32	6	24	***
SAtlntc	In the South Atlantic census division	16	36	17	38	***
ESCetrl	In the East South Central census division	8	28	7	25	***
WSCetrl	In the West South Central census division	16	37	13	33	***
Mtn	In the Mountain census division	6	25	5	22	***
Pac	In the Pacific census division	13	34	15	35	***
Number of households		372,182		387,375		

AMI = area median income. FMR = Fair Market Rent. LIHTC = low-income housing tax credit. Stdev = standard deviation.

*Notes: *** significance at the 1-percent level; ** significance at the 5-percent level; * significance at the 10-percent level.*

Appendix B

Exhibit B-1

Estimates From the Full Piecewise-Exponential Duration Model

Variable	Characteristics	All Households		Nonelderly Heads of Households With a Child or Children		Nonelderly, Disabled Heads of Households With a Child or Children		Nonelderly Heads of Households With at Least One Disabled Child	
		Coeff.	Time Ratio	Coeff.	Time Ratio	Coeff.	Time Ratio	Coeff.	Time Ratio
Panel A: Household Characteristics									
AgeHH	Age of household head	– 0.0045	0.9955 ***	– 0.0012	0.9988	– 0.0104	0.9897 ***	– 0.0006	0.9994
FamSize	Number of people in the household	– 0.0725	0.9301 ***	– 0.0764	0.9264 ***	– 0.0597	0.9420 ***	– 0.1277	0.8801 **
Adult1824	Presence in household of adults ages 18–24	– 0.0497	0.9515 ***	– 0.0399	0.9609 ***	– 0.0646	0.9374 **	0.0958	1.1005
Adult2534	Presence in household of adults ages 25–34	– 0.0092	0.9909	– 0.0144	0.9857	– 0.0324	0.9681	0.1236	1.1316
Adult35p	Presence in household of adults ages 35 or older	0.0550	1.0566 ***	0.0253	1.0256	0.0708	1.0733 **	0.0594	1.0612
Black	Head of household is non-Hispanic African American	0.4145	1.5136 ***	0.4399	1.5525 ***	0.2386	1.2695 ***	0.4427	1.5569 ***
Hispanic	Head of household is Hispanic	0.2530	1.2879 ***	0.2584	1.2949 ***	0.2504	1.2845 ***	0.2956	1.3440 ***
Other	Head of household is other race	0.1750	1.1913 ***	0.1564	1.1693 ***	0.2755	1.3172 ***	0.2084	1.2316 *
Female	Head of household is female	0.1663	1.1809 ***	0.1708	1.1862 ***	0.1584	1.1716 ***	0.1791	1.1962 ***
Homeless	Head of household was previously homeless	– 0.0319	0.9686 *	– 0.0325	0.9681 *	– 0.1264	0.8813 ***	0.2095	1.2330 *
Income[a]	Total household annual income	– 0.0094	0.9907 ***	– 0.0052	0.9948 ***	– 0.0155	0.9846 ***	– 0.0297	0.9707 ***
Wage[a]	Total household wage income	61.0000	1.0061 ***	0.0023	1.0023 ***	0.0162	1.0164 ***	0.0318	1.0323 ***
H2	Nonelderly, disabled head of household with a child or children	0.1741	1.1902 ***						
H3	Nonelderly head of household with at least one disabled child	0.2403	1.2716 ***						

Exhibit B-1

Estimates From the Full Piecewise-Exponential Duration Model (continued)

Variable	Characteristics	All Households		Nonelderly Heads of Households With a Child or Children		Nonelderly, Disabled Heads of Households With a Child or Children		Nonelderly Heads of Households With at Least One Disabled Child	
		Coeff.	Time Ratio	Coeff.	Time Ratio	Coeff.	Time Ratio	Coeff.	Time Ratio
Panel B: Child-Related Characteristics									
nKids	Number of children in household	0.0881	1.0921 ***	0.0947	1.0993 ***	0.0240	1.0243	0.1072	1.1132 *
Kids03	Presence in household of infants ages 0–3	0.1217	1.1294 ***	0.1190	1.1264 ***	0.2098	1.2334 ***	0.2219	1.2484 ***
Kids45	Presence in household of toddlers ages 4–5	0.1349	1.1445 ***	0.1153	1.1222 ***	0.2989	1.3484 ***	0.2367	1.2670 ***
Kids612m	Presence in household of male young children ages 6–12	0.1316	1.1406 ***	0.1087	1.1148 ***	0.2982	1.3474 ***	0.1696	1.1849 ***
Kids612f	Presence in household of female young children ages 6–12	0.1397	1.1500 ***	0.1199	1.1273 ***	0.2962	1.3447 ***	0.1321	1.1412 ***
Kids1317m	Presence in household of male teenagers ages 13–17	– 0.0470	0.9541 ***	– 0.0506	0.9506 ***	0.0318	1.0323	– 0.0754	0.9273
Kids1317f	Presence in household of female teenagers ages 13–17	– 0.0470	0.9541 ***	– 0.0506	0.9506 ***	0.0318	1.0323	– 0.0754	0.9273
Kids03*Kids612m	Presence in household of infants ages 0–3 and male young children ages 6–12	– 0.0487	0.9525 ***	– 0.0353	0.9653 ***	– 0.1740	0.8403 ***	– 0.1101	0.8957 *
Kids03*Kids612f	Presence in household of infants ages 0–3 and female young children ages 6–12	– 0.0356	0.9650 ***	– 0.0322	0.9683 **	– 0.0769	0.9259 *	– 0.0098	0.9903
Kids03*Kids1317m	Presence in household of infants ages 0–3 and male teenagers ages 13–17	0.0816	1.0851 ***	0.0576	1.0593 **	0.1195	1.1269 *	0.3251	1.3842 ***
Kids03*Kids1317f	Presence in household of infants ages 0–3 and female teenagers ages 13–17	– 0.0189	0.9813	– 0.0251	0.9752	0.0134	1.0135	– 0.0896	0.9143

Exhibit B-1

Estimates From the Full Piecewise-Exponential Duration Model (continued)

Variable	Characteristics	All Households		Nonelderly Heads of Households With a Child or Children		Nonelderly, Disabled Heads of Households With a Child or Children		Nonelderly Heads of Households With at Least One Disabled Child	
		Coeff.	Time Ratio	Coeff.	Time Ratio	Coeff.	Time Ratio	Coeff.	Time Ratio
Kids45*Kids612m	Presence in household of toddlers ages 4–5 and male young children ages 6–12	– 0.0990	0.9057 ***	– 0.0739	0.9288 ***	– 0.2414	0.7855 ***	– 0.2191	0.8033 ***
Kids45*Kids612f	Presence in household of toddlers ages 4–5 and female young children ages 6–12	– 0.1089	0.8968 ***	– 0.0992	0.9056 ***	– 0.1719	0.8420 ***	– 0.0657	0.9364
Kids45*Kids1317m	Presence in household of toddlers ages 4–5 and male teenagers ages 13–17	0.1383	1.1483 ***	0.1316	1.1407 ***	0.1723	1.1881 **	0.1095	1.1158
Kids45*Kids1317f	Presence in household of toddlers ages 4–5 and female teenagers ages 13–17	0.0592	1.0610 **	0.0486	1.0498 *	0.0974	1.1024	0.0953	1.1000
Panel C: Location Characteristics									
Lihtc[b]	Number of LIHTC units in census tract	0.0052	1.0052 *	0.0066	1.0066 **	– 0.0088	0.9913	0.0284	1.0288 *
Unemp	Metropolitan area unemployment rate, 2000	– 2.2969	0.1006 ***	– 2.6243	0.0725 ***	– 0.3901	0.6770	1.8326	6.2501
Vacancy	Metropolitan area rental vacancy rate, 2000	– 0.6326	0.5312 ***	– 0.6283	0.5335 ***	– 0.5831	0.5581 ***	– 0.6802	0.5065 ***
City	Household located in central city	0.0685	1.0709 ***	0.0734	1.0762 ***	0.0281	1.0285	0.0720	1.0747 *
Rural	Household located in rural or nonmetropolitan area	– 0.2592	0.7717 ***	– 0.2658	0.7666 ***	– 0.1983	0.8201 ***	– 0.2976	0.7426 ***
NEgInd	In the New England census division	0.1566	1.1695 ***	0.1590	1.1724 ***	0.1791	1.1961 ***	0.0610	1.0629
MAtlntc	In the Middle Atlantic census division	0.1322	1.1414 ***	0.1416	1.1521 ***	0.0975	1.1024 ***	0.0056	1.0056

Exhibit B-1

Estimates From the Full Piecewise-Exponential Duration Model (continued)

Variable	Characteristics	All Households		Nonelderly Heads of Households With a Child or Children		Nonelderly, Disabled Heads of Households With a Child or Children		Nonelderly Heads of Households With at Least One Disabled Child	
		Coeff.	Time Ratio	Coeff.	Time Ratio	Coeff.	Time Ratio	Coeff.	Time Ratio
ENCetrl	In the East North Central census division	– 0.1156	0.8908 ***	– 0.1161	0.8904 ***	– 0.0668	0.9354 **	– 0.1446	0.8654 *
WNCetrl	In the West North Central census division	– 0.2872	0.7504 ***	– 0.2942	0.7451 ***	– 0.1673	0.8459 ***	– 0.3823	0.6823 ***
SAtlntc	In the South Atlantic census division	– 0.1519	0.8591 ***	– 0.1522	0.8588 ***	– 0.1179	0.8888 ***	– 0.1544	0.8570 **
ESCetrl	In the East South Central census division	– 0.2076	0.8126 ***	– 0.2037	0.8157 ***	– 0.1625	0.8501 ***	– 0.4075	0.6653 ***
WSCetrl	In the West South Central census division	– 0.3027	0.7388 ***	– 0.3068	0.7358 ***	– 0.2014	0.8176 ***	– 0.3314	0.7179 ***
Mtn	In the Mountain census division	– 0.1589	0.8531 ***	– 0.1633	0.8493 ***	– 0.0569	0.9447	– 0.3890	0.6777 ***
Number of Households		759,557		637,772		95,906		25,879	

Coeff. = coefficient. LIHTC = low-income housing tax credit.

[a] For the piecewise-exponential duration model, the income and wage variables were adjusted (divided) by a factor of 1,000.

[b] For the piecewise-exponential duration model, the LIHTC variable was adjusted (divided) by a factor of 100.

*Notes: *** significance at the 1-percent level; ** significance at the 5-percent level; * significance at the 10-percent level.*

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Are Census Variables Highly Correlated With Housing Choice Voucher Holders' Perception of the Quality of Their Neighborhoods?

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Abstract

This article presents the results of a study examining voucher holders' ratings of their neighborhoods on the U.S. Department of Housing and Urban Development's Housing Choice Voucher Program Customer Satisfaction Survey. Specifically, the study examines whether these ratings were internally consistent and whether they were highly correlated with any census neighborhood variables often used as measures of neighborhood quality. We found that the voucher holders' neighborhood ratings were consistent with their answers to more specific survey questions about the attributes of their neighborhoods but only weakly correlated with census-based measures of neighborhood quality. Internal consistency was demonstrated by the strong correlation between neighborhood ratings and voucher holders' perceptions of crime problems and physical disorder in their neighborhoods. The comparison with census-based measures of the neighborhood showed that, although a very systematic correlation exists between the neighborhood rating and census measures of the neighborhood, the correlation was not very strong for any of the census variables tested. The variable with the strongest correlation (percentage of female-headed households with children) explained less than 5 percent of the variation in the neighborhood rating. Furthermore, combining multiple census variables into a neighborhood quality indicator increased the explanatory power by only a small amount.

Introduction

To measure the customer satisfaction of Housing Choice Voucher Program (HCVP) recipients, the U.S. Department of Housing and Urban Development (HUD) surveyed housing voucher holders by mail (the HCVP Customer Satisfaction Survey), asking recipients about their housing and their neighborhoods. Focusing on one neighborhood question that asked respondents to rate their neighborhoods on a scale of 1 to 10, this study first examines whether voucher holders' neighborhood ratings were consistent with their responses to other survey questions about their neighborhoods. It then compares voucher holders' neighborhood ratings with census variables that measure attributes of their neighborhoods and explores whether there is a census-based indicator of neighborhood quality that is highly correlated with voucher holders' neighborhood ratings. If such a census-based indicator can be derived, then it can be used as a proxy for voucher holders' satisfaction with the quality of the neighborhoods where they use their vouchers.

Data

This study uses data from a national mail survey of HCVP recipients, conducted in 2000, 2001, and 2002, and the decennial census in 2000.

HCVP Customer Satisfaction Survey

The HCVP Customer Satisfaction Survey collects respondents' perceptions of the quality of their housing and neighborhoods. The survey questions were tested in two large pilot studies. The pilot studies sampled more than 5,000 households of various composition types and demographic categories in 11 counties of various sizes in Illinois, Indiana, and Missouri.

Those pilot studies had high response rates of 76 percent in the first pilot and 58 to 74 percent in the second pilot, depending on the survey delivery method and the housing program. In both pilot studies, residents' ratings on the quality of their housing were compared with an evaluation of their units by professional inspectors; the degree of agreement was high. Of the 64 dichotomous items compared, 38 percent had rates of agreement of 90 percent or higher, and another 23 percent had rates of agreement between 80 and 90 percent. Agreement rates for the 20 nondichotomous items tested were 80 percent or more for 80 percent of the items. In addition, inspectors' assessments of the same unit conducted at two different times agreed as much as residents' and inspectors' assessments. These results suggest that the survey responses on the dimensions of housing quality covered in the survey are as consistent and accurate as could be obtained using professional inspectors.

Although the survey validation issues analyzed in the pilot studies focused on housing quality rather than on neighborhood quality, the results indicate that survey respondents took the survey seriously and tried to provide meaningful answers. These results give us confidence that their responses to the neighborhood quality questions also are meaningful.

In addition to testing the validity of survey responses, the pilot studies tested two types of survey distribution methods: centralized distribution by mail compared with distribution by public housing agency (PHA) staff. The centralized, mail-delivered distribution was more successful. It

had a higher response rate and also provided a higher degree of confidentiality, both of which contributed to the quality and reliability of resident responses to the HCVP Survey.

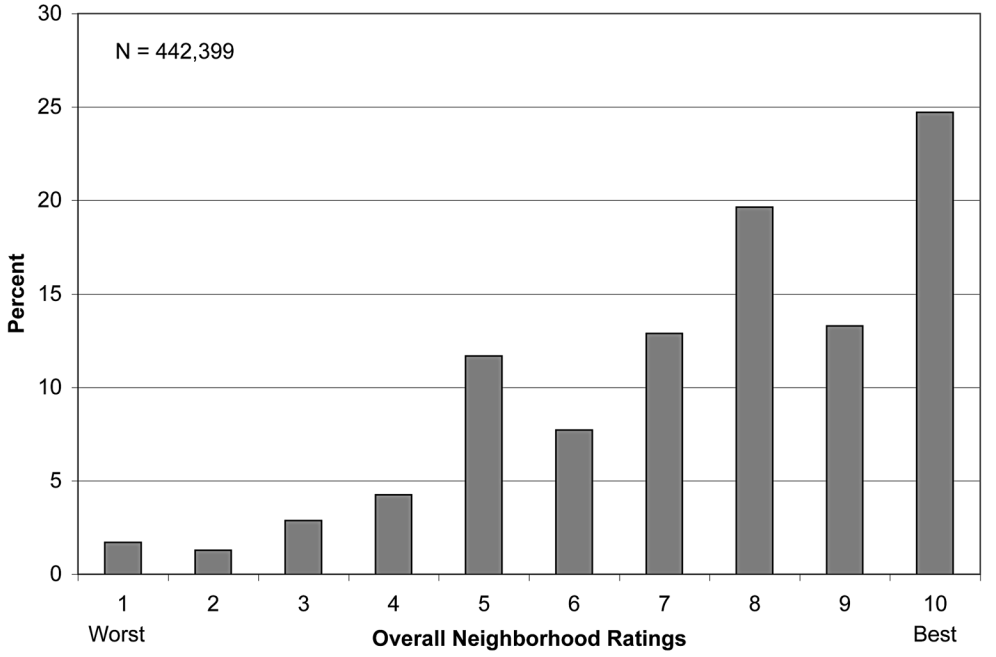
The HCVP Survey data for this study are from the annual surveys conducted between 2000 and 2002. The data set contains 887,689 records of all the households to which surveys were mailed in those 3 years. The overall response rate to the HCVP Survey, conducted in 2000, 2001, and 2002, was 51.7 percent, with a total of 459,298 responses.[1]

The HCVP Survey asks voucher recipients to rate their neighborhoods on a scale of 1 to 10, with 1 being the worst rating and 10 being the best rating. The distribution of the neighborhood ratings is shown in exhibit 1. The neighborhood ratings were generally high, with nearly one-fourth of the respondents rating their neighborhoods a 10 (the highest possible rating) and 70 percent rating their neighborhoods a 7 or above. A small portion (3.7 percent) of the respondents did not rate their neighborhoods, leaving 442,399 records for analysis.

The neighborhood section of the HCVP Survey also asked voucher recipients to assess if each of the three neighborhood attributes listed in the next paragraph was "A Big Problem," "Some Problem," or "Not a Problem." We used these neighborhood variables for checking whether

Exhibit 1

Distribution of HCVP Survey Respondents' Overall Neighborhood Ratings



HCVP = Housing Choice Voucher Program.
Note: The sample includes all survey respondents who provided a neighborhood rating (n = 442,399).
Source: HCVP Customer Satisfaction Survey, 2000, 2001, and 2002

[1] The responses by year number 173,362 in 2000, 166,844 in 2001, and 119,092 in 2002.

respondents' answers were consistent with their overall neighborhood ratings. That is, we used these variables to check the internal (within the same respondent's survey) consistency of their answers. Some respondents either did not respond to these neighborhood questions or responded that they did not know. Percentages of missing and "Don't Know" responses among those who rated their neighborhood are noted in parentheses.

1. Crime or drugs. (20.7 percent)
2. Vacant or rundown homes or stores. (11.7 percent)
3. Trash or junk on nearby streets, sidewalks, or properties. (6.1 percent)

Exhibit 2 shows the breakdown of missing rates among the neighborhood variables by the overall neighborhood rating. The missing rates of the neighborhood variables were not evenly distributed across the overall neighborhood rating. Respondents who rated their neighborhoods highest (8 to 10) were generally the least likely to have missing information on the other questions.

The differences were small in the mean neighborhood rating between the groups that answered these neighborhood questions and the groups that did not answer or answered "Don't Know." The groups that answered all three neighborhood questions rated their neighborhoods 7.5 on average. The groups that did not answer the neighborhood questions or answered "Don't Know" rated their neighborhoods from 7.0 to 7.4 on average. The differences were statistically significant but small and, therefore, did not meet the minimum size effect of a 1-point difference in the neighborhood rating that we determined was meaningful.

We established a minimum size effect to identify a difference that would be meaningful because statistical significance tests were not useful with a sample of more than 400,000 respondents. Even very small differences that did not reflect substantive differences would be statistically significant with a sample size this large. We based our determination of a 1-point difference in the overall neighborhood rating as a meaningful size effect based on research literature that defines a "medium effect size" as half a standard deviation of the variable of interest.[2] In the overall neighborhood

Exhibit 2

Missing Rate by Neighborhood Rating

Missings and Don't Knows for HCVP Survey Neighborhood Variables	Neighborhood Rating		
	1–4 (N = 44,667)	5–7 (N = 142,723)	8–10 (N = 255,009)
	(percent)		
Crime and drugs in neighborhood	14.5	25.3	19.3
Trash or junk on nearby streets, sidewalks, or properties	6.9	7.4	5.2
Vacant or rundown homes or stores in neighborhood	16.0	13.0	9.3

HCVP = Housing Choice Voucher Program.

Note: The sample includes all survey respondents who provided a neighborhood rating (n = 442,399).

Source: HCVP Customer Satisfaction Survey, 2000, 2001, and 2002

[2] See Cohen (1988), who defines a medium effect size as an effect that is at least one-half the size of the standard deviation.

rating, we used the difference of 1 point in the 10-point neighborhood rating scale as a meaningful effect size because it was roughly half the standard deviation of the neighborhood rating, or 2.2. For example, a difference in the average neighborhood rating of an 8 for HCVP Survey respondents identifying crimes and drugs as a big problem in the neighborhood and a 7 for the group identifying it as some problem would exactly meet the minimum criterion to be a meaningful difference.

In addition to variables from the neighborhood section of the HCVP tenant survey, we also selected four "Yes/No" questions from the survey sections on "area outside of the home" and "sanitation and safety" for the internal consistency checks. We added these variables because they also seem to measure neighborhood conditions. Very few of the survey respondents were missing responses to these questions; therefore, we did not analyze these missing data further. The variables used for the internal consistency check are listed below; the percentages of missing responses are shown in parentheses.

1. Is there enough light for safety (outside your home)? (1.6 percent)
2. Does the garbage service pick up each week? (1.5 percent)
3. Did you see a rat anywhere in your building or outside around the grounds this week? (1.4 percent)
4. In the last 3 months, has your mail been stolen or tampered with? (1.8 percent)

Decennial Census 2000 Data

This study uses census data at the tract level from the 2000 Census to compare with voucher holders' neighborhood ratings from the survey. The census variables chosen for this study were based on a review of recent literature that used census variables as measures of neighborhood quality. We then merged the selected census tract-level data variables with the HCVP Survey data using the census tract identifiers.

Geocodes were missing for 5.5 percent of the HCVP Survey respondents who rated their neighborhoods. As a result, census tract-level variables could not be attached to those records, leaving 418,308 records for analysis. The difference in the average neighborhood rating between records with geocodes and records without geocodes was only 0.3 points, which is well below the 1-point effect size we used as a minimum threshold for a significant substantive difference. The differences in other HCVP Survey neighborhood variables were also very small and well below half the standard errors of those variables. From this difference, we concluded that missing geocodes would not bias the analysis of census data for respondents to the HCVP Survey.

A Comparison With Other Survey Responses About the Neighborhood

To check the consistency of voucher holders' overall neighborhood ratings to other questions about their neighborhoods, we used the other three questions from the neighborhood section of the HCVP Survey and four selected questions from the survey sections on "area outside of the home" and "sanitation and safety."

Exhibit 3a shows the percentage of respondents who reported "A Big Problem" on the three specific neighborhood quality questions by their overall rating of the neighborhood (in rating groups 1 to 4, 5 to 7, and 8 to 10).

Exhibit 3a

Percentage of Respondents Reporting "A Big Problem" on Neighborhood Questions by Overall Neighborhood Rating Category

Problems in Neighborhood	Percent Reporting "A Big Problem" by Neighborhood Rating		
	1–4 (N = 44,667)	5–7 (N = 142,723)	8–10 (N = 255,009)
Crime and drugs in neighborhood	50.5	12.0	1.6
Trash or junk on nearby streets, sidewalks, or properties	31.1	7.9	1.6
Vacant or rundown homes or stores in neighborhood	15.9	3.1	0.6

Notes: The sample includes all survey respondents who provided a neighborhood rating (n = 442,399). Complete responses number 350,771 for the crime and drugs variable, 415,561 for the trash or junk variable, and 393,044 for the vacant or rundown buildings variable.

Source: Housing Choice Voucher Program Customer Satisfaction Survey, 2000, 2001, and 2002

The percentage of respondents reporting "A Big Problem" for each of these neighborhood quality variables was substantially higher, the lower the neighborhood rating.[3] For each of the three variables, respondents who gave their neighborhood a low rating (between 1 and 4) were approximately 4 times more likely to report the quality variable was "A Big Problem" compared with respondents who gave their neighborhoods a middle rating (between 5 and 7); they were 20 to 30 times more likely to report the issue as "A Big Problem" than were respondents who gave their neighborhoods a high rating (between 8 and 10). For example, 50 percent of the respondents who gave their neighborhoods a low rating reported crime and drugs were "A Big Problem" in their neighborhoods compared with 12 percent of respondents who gave their neighborhoods a middle rating and 1.6 percent of respondents who gave their neighborhoods a high rating. Clearly, perceptions of big problems with these specific neighborhood issues are consistent with the overall neighborhood ratings.

We also examined differences in overall neighborhood ratings across respondents who reported an item in the neighborhood section of the survey as "A Big Problem," those who reported it as "Some Problem," and those who reported it as "Not a Problem" in their neighborhoods. Exhibit 3b shows these results.

Respondents reporting "Not a Problem" consistently rated their neighborhoods higher than those who reported "Some Problem," who in turn rated their neighborhoods higher than those who reported "A Big Problem." The differences in average neighborhood ratings between respondents citing various levels of problems were statistically significant and greater than our 1-point minimum size effect criterion.

The last column of exhibit 3b shows the Pearson correlation coefficient between recipients' responses to each individual question in the neighborhood section and their overall rating of

[3] All chi-squared statistics testing the relationship between the overall neighborhood rating and each specific neighborhood survey item were statistically significant.

Exhibit 3b

Average Neighborhood Rating and Pearson Correlation Coefficient by Response to Problem-in-Neighborhood Questions

Problems in Neighborhood	Average Neighborhood Rating (percent)	Pearson Correlation Coefficient
Crime and drugs in neighborhood		
"A Big Problem"	4.2	
"Some Problem"	6.3	– 0.62
"Not a Problem"	8.5	
Trash or junk on nearby streets, sidewalks, or properties		
"A Big Problem"	4.6	
"Some Problem"	6.1	– 0.49
"Not a Problem"	8.1	
Vacant or rundown homes or stores in neighborhood		
"A Big Problem"	4.4	
"Some Problem"	5.7	– 0.39
"Not a Problem"	7.9	

Notes: The sample includes all survey respondents who provided a neighborhood rating (n = 442,399). Complete responses number 350,771 for the crime and drugs variable, 415,561 for the trash or junk variable, and 393,044 for the vacant or rundown buildings variable.

Source: Housing Choice Voucher Program Customer Satisfaction Survey, 2000, 2001, and 2002

their neighborhoods. According to the Pearson correlation coefficients, all neighborhood problem variables were strongly and negatively correlated to the overall neighborhood ratings, confirming that respondents with more neighborhood problems gave their neighborhoods lower ratings. The correlation of –0.62 between the crime and drugs variable and the overall neighborhood rating was especially strong, suggesting that the perception of crime and drugs strongly influenced the overall neighborhood rating; it explained almost 40 percent of the variation in the neighborhood rating.[4]

We also selected four "Yes/No" questions from the survey sections on "area outside of the home" and "sanitation and safety" for our internal consistency checks. The results were similar to the HCVP Survey neighborhood variable results shown earlier, but the relationships were not as strong. As exhibit 4a shows, respondents who gave their neighborhoods a low rating were about twice as likely as respondents who gave their neighborhoods a middle rating and about four times as likely as respondents who gave their neighborhoods a high rating to report these issues as problems. The one exception was with the weekly garbage pickup variable, which did not vary much by neighborhood rating.

We also computed the Pearson correlation coefficient and average neighborhood rating for responses to each of the four selected variables from the survey sections on the area outside of the home and on sanitation and safety, as shown in exhibit 4b. The differences in average neighbor-

[4] The square of the correlation coefficient is the same as the R-square of a regression of neighborhood rating on the neighborhood item of interest.

Exhibit 4a

Percentage of Respondents Reporting a Problem on Other HCVP Survey Questions by Overall Neighborhood Rating Category

Other HCVP Survey Variables That Are Potential Neighborhood Indicators	Percent Reporting Stated Issue by Neighborhood Rating		
	1–4 (N = 44,667)	5–7 (N = 142,723)	8–10 (N = 255,009)
Outside of home			
Not enough light for safety	30.2	16.2	7.9
Garbage service does not pick up each week	7.5	4.8	4.5
Sanitation and safety			
Rats in building or outside around grounds this week	21.0	9.9	4.7
Mail stolen or tampered with in last 3 months	18.1	7.9	3.8

HCVP = Housing Choice Voucher Program.

Notes: The sample includes all survey respondents who provided a neighborhood rating (n = 442,399). Complete responses number 435,388 for the external light variable, 435,583 for the garbage collection variable, 436,324 for the rats variable, and 434,401 for the mail-tampering variable.

Source: HCVP Customer Satisfaction Survey, 2000, 2001, and 2002

Exhibit 4b

Average Neighborhood Rating and Pearson Correlation Coefficient by Response to Other HCVP Survey Questions

Other HCVP Survey Variables That Are Potential Neighborhood Indicators	Average Neighborhood Rating (percent)	Pearson Correlation Coefficient
Outside of home		
Not enough light for safety		
Yes	6.2	– 0.22
No	7.7	
Garbage service does not pick up each week		
Yes	7.2	– 0.03
No	7.5	
Sanitation and safety		
Rats in building or outside around grounds this week		
Yes	6.1	– 0.19
No	7.6	
Mail stolen or tampered with in last 3 months		
Yes	6.0	– 0.17
No	7.6	

HCVP = Housing Choice Voucher Program.

Notes: The sample includes all survey respondents who provided a neighborhood rating (n = 442,399). Complete responses number 435,388 for the external light variable, 435,583 for the garbage collection variable, 436,324 for the rats variable, and 434,401 for the mail-tampering variable.

Source: HCVP Customer Satisfaction Survey, 2000, 2001, and 2002

hood ratings between respondents who cited problems and those who did not cite problems were statistically significant and greater than 1 point (except for problems with garbage pickup).

According to the Pearson correlation coefficients, the selected variables were negatively and moderately correlated to the overall neighborhood ratings, confirming that respondents who reported problems rated their neighborhoods lower. In other words, the selected variables seemed to play a role in respondents' overall neighborhood ratings. The only exception was the variable about weekly garbage pickup. Respondents who reported that the garbage service did not pick up their garbage weekly also rated their neighborhoods only 0.3 point lower than respondents who reported regular weekly garbage pickup. The correlation between the weekly garbage pickup variable and the overall neighborhood rating was almost nonexistent at only –0.03, which led us to conclude that respondents' ratings of the variable on weekly garbage pickup had virtually no role in respondents' overall neighborhood ratings.

From our analysis, we conclude that respondents' overall neighborhood ratings are internally consistent with their responses to other questions about attributes of their neighborhood. The role of these neighborhood attributes in respondents' overall neighborhood ratings, however, range from strong (crime and drugs variable) to almost none (weekly garbage pickup variable). Exhibit 5 summarizes the findings by ordering the HCVP Survey variables from the strongest to weakest relationship with the overall neighborhood rating.

Exhibit 5

Summary of Internal Consistency Checks

HCVP Survey Variables That Are Potential Neighborhood Indicators	Pearson Correlation Coefficient
Problems with crime and drugs in neighborhood	– 0.62
Problems with trash or junk on nearby streets, sidewalks, or properties	– 0.49
Problems with vacant or rundown homes or stores in neighborhood	– 0.39
Not enough light for safety outside of home	– 0.22
Rats in building or outside around grounds this week	– 0.19
Mail stolen or tampered with in last 3 months	– 0.17
Garbage service does not pick up each week	– 0.03

HCVP = Housing Choice Voucher Program.

Notes: The sample includes all survey respondents who provided a neighborhood rating (n = 442,399). Complete responses number 350,771 for the crime and drugs variable, 415,561 for the trash or junk variable, 393,044 for the vacant or rundown buildings variable, 435,388 for the external light variable, 436,324 for the rats variable, 434,401 for the mail-tampering variable, and 435,583 for the garbage collection variable.

Source: HCVP Customer Satisfaction Survey, 2000, 2001, and 2002

A Comparison of Neighborhood Ratings and Census-Based Measures of Neighborhood Quality

The census tract poverty rate is the most widely used neighborhood quality indicator from census data. We calculated the percentage of voucher holders in each poverty rate category by the voucher holders' rating of their neighborhood. The results in exhibit 6 indicate that the voucher hold-

ers' neighborhood ratings moderately correlate with the census tract poverty rate. For example, respondents who gave their neighborhoods high ratings were more than twice as likely to live in census tracts with poverty rates below 10 percent as were respondents who gave their neighborhoods poor ratings (32.7 percent compared with 15.8 percent, respectively). Conversely, respondents who rated their neighborhoods as high were half as likely to live in a census tract with poverty rates above 30 percent as were respondents who rated their neighborhoods as low (10.1 percent compared with 22 percent, respectively).

This pattern was also clear when we looked at average overall neighborhood ratings by respondents in census tracts with various poverty rates (also shown in exhibit 6). The respondents' average neighborhood rating dropped systematically from 8 to 6.8 as we moved from respondents living in low-poverty census tracts to respondents living in high-poverty census tracts; however, the difference in the average neighborhood rating between the respondents in the lowest and highest poverty census tracts was only slightly above our 1-point minimum effect size. This narrow variation in the average overall neighborhood rating between respondents living in a census tract with differing poverty rates was corroborated by the Pearson correlation coefficient of –0.18 between the poverty rate and the overall neighborhood rating, shown in exhibit 7. These results suggest that, even though the census tract poverty rate was correlated with the respondents' overall neighborhood rating, it alone did not explain most of the differences in neighborhood ratings.

Exhibit 7 shows the correlation between respondents' overall neighborhood ratings and a host of census variables that have been reported in the research literature as measures of neighborhood quality. The relationships among all the census tract neighborhood variables and the respondents' overall neighborhood ratings were in the expected direction; however, none of the correlations were very strong. The strongest correlation was only –0.22. In other words, not one census variable on its own captured much of what determines the respondents' overall neighborhood ratings.

We also computed the averages of all census variables for each of the 10 groups of respondents rating their neighborhoods on a scale from 1 to 10. Exhibit 7 shows the average of each census

Exhibit 6

Comparison of Neighborhood Ratings and Census Tract-Level Poverty Rate Categories

Census Tract-Level Poverty Rate	Percent in Poverty Category by Neighborhood Rating			
	1–4 (N = 42,597)	5–7 (N = 135,815)	8–10 (N = 239,896)	Average
Less than 10%	15.8	22.2	32.7	8.0
10–19.99%	36.3	40.0	40.3	7.5
20–29.99%	25.9	22.4	17.0	7.1
30–39.99%	14.5	10.4	6.7	6.8
40% or more	7.5	4.9	3.4	6.8
Total	100.0	100.0	100.0	7.5

Note: The sample includes survey respondents who provided a neighborhood rating and could have their record matched to census data at the census tract level (n = 418,308).

Sources: Housing Choice Voucher Program Customer Satisfaction Survey, 2000, 2001, and 2002; 2000 Decennial Census

Exhibit 7

Comparison of Neighborhood Ratings and Census 2000 Variables

Selected Census Variables	Correlation to Neighborhood Rating		Average by Neighborhood Rating		
	Sign	Coefficient	1	5	10
Households with female heads and own children under 18 years old (percent)	–	0.2160	13	11	8
Households with female heads (percent)	–	0.2077	21	17	14
People with income twice or more the poverty level (percent)	+	0.1867	52	57	64
People 15 years old or older who are married females (percent)	+	0.1836	23	25	27
Families with related children under 18 years old (percent)	–	0.1827	59	57	53
Households receiving public assistance income (percent)	–	0.1798	7	6	4
Housing units that are owner occupied (percent)	+	0.1780	49	53	61
People with income lower than the poverty level (percent)	–	0.1780	24	20	16
Housing units without vehicles (percent)	–	0.1720	20	16	12
People who are non-Hispanic Whites (percent)	+	0.1671	49	60	71
People who are minorities (percent)	–	0.1671	51	40	29
Households with minority heads (percent)	–	0.1646	47	36	25
Civilian people 16 years old or older who are unemployed (percent)	–	0.1620	6	5	4
Civilian people 16 years old or older In managerial, professional, and technical employment (percent)	+	0.1552	23	25	28
People who are non-Hispanic Blacks (percent)	–	0.1541	31	21	13
Median household income (dollars)	+	0.1500	29,658	32,044	36,390
People 25 years old or older without a high school diploma (percent)	–	0.1437	30	27	23
People who are 9 years old or younger (percent)	–	0.1391	16	15	14
People 25 years old or older with a college degree or more education (percent)	+	0.1289	19	21	25
People 16 to 19 years old who are high school dropouts (percent)	–	0.1273	16	14	11
Civilian uninstitutionalized people 5 years old or older who are disabled (percent)	–	0.1259	25	24	22
People 16 to 19 years old who are in school (percent)	+	0.1217	72	73	77
Households with heads under 35 years old (percent)	–	0.1137	26	26	23
Median gross rent to median value of owner-occupied housing (capitalization rate) (percent)	–	0.1106	0.68	0.65	0.59

Exhibit 7

Comparison of Neighborhood Ratings and Census 2000 Variables (continued)

Selected Census Variables	Correlation to Neighborhood Rating		Average by Neighborhood Rating		
	Sign	Coefficient	1	5	10
Housing units (with heads 15 years old or older) that households moved into more than 5 years ago (percent)	+	0.1091	47	48	51
Housing units built since 1980 (percent)	+	0.1052	21	22	27
Median value of owner-occupied housing units (dollars)	+	0.0857	87,775	93,413	107,219
Median gross monthly rent (dollars)	+	0.0506	508	522	542
Housing units that are vacant (percent)	–	0.0442	10	9	9

Note: The sample includes survey respondents who provided a neighborhood rating and could have their record matched to census data at the census tract level (n = 418,308).

Sources: Housing Choice Voucher Program Customer Satisfaction Survey, 2000, 2001, and 2002; 2000 Decennial Census

tract neighborhood variable for respondents who gave their neighborhoods the lowest ratings (1), middle ratings (5), and highest ratings (10). The consistency in the way the averages of the census tract neighborhood variables changed from one respondent groups' neighborhood ratings to another was remarkable. This pattern is more clearly visible in the complete table in the appendix.[5] Although a consistent relationship exists between the census variables and the neighborhood ratings, the differences in the average value of the census variables across the overall neighborhood ratings were small. The small difference indicates that each census variable on its own was not capturing much of what determined respondents' neighborhood ratings.

Nevertheless, several variables stood out. The percentage of female-headed households with children had the strongest correlation with overall neighborhood ratings. In fact, the correlation of the single-mother variable to the overall neighborhood rating was stronger than the correlation between the neighborhood poverty rate and the overall neighborhood rating. In addition, the overall neighborhood rating also had a slightly stronger correlation with the prevalence of receipt of public assistance and share with income greater than two times the poverty level in the neighborhood than with the neighborhood poverty rate.

From our analysis, we conclude that the neighborhood rating is weakly correlated with the external census measures of neighborhood quality. We say "weakly" because none of the census variables have a very strong relationship with the responding voucher holders' neighborhood ratings. Nonetheless, across a wide spectrum of census measures of neighborhood quality, a consistent pattern is evident that respondents' higher neighborhood ratings are associated with higher census measures of neighborhood quality.

[5] The appendix shows the values for every neighborhood rating from 1 to 10. The appendix also includes several additional variables that had low correlations with neighborhood ratings and, thus, were not included in exhibit 7.

Deriving a Census-Based Measure of Neighborhood Quality

Because none of the individual census variables were strongly correlated with responding voucher holders' overall neighborhood ratings, we attempted to derive a neighborhood quality index from census variables that would be strongly correlated with neighborhood quality. As a first step to building a census-based measure of neighborhood quality, we compiled a list of 55 census variables that were used as neighborhood quality indicators in the research literature and grouped them into 10 categories, such as household type and income.[6] Using the decennial Census 2000 data, we created census variables quantifying census tract-level percentages (for example, percentage of persons in the census tract with incomes below the poverty level). After preparing the data, we selected a 25-percent random subsample of HCVP Survey respondents for use in establishing a census-based neighborhood quality indicator. The subsample contains 104,580 HCVP Survey respondent records.

Because the studies of neighborhood quality we reviewed had closely related variables, our compiled list contained duplicate or similar variables. We eliminated obvious duplicates (for example, "percent White" was kept but "percent minority" was not). Then we chose between two or more census variables measuring very similar attributes—often derived from the same census count data—based on their correlation with the HCVP Survey respondents' neighborhood ratings and with each other. As a result, we pared the list from 55 variables to 35 variables, shown in exhibit 8 in descending order of their correlation with the HCVP Survey respondents' neighborhood ratings. The census variable with the strongest correlation coefficient is shown first; the variable with the next highest correlation coefficient is shown second, and so on.

Exhibit 8 shows that six census variables—the percentage of households headed by a female with own children under 18 years old in particular—have a higher correlation with the HCVP neighborhood ratings than do the poverty rates. The percentage of households headed by a female with own children explained 4.7 percent of the variation in the HCVP neighborhood rating compared with 3.1 percent explained by the poverty rate.[7] This finding that some census variables have a higher correlation with the voucher holders' neighborhood ratings suggests that building a census-based index of neighborhood quality might result in a more accurate census-based neighborhood quality measure than using the poverty rate alone.

Preliminary Regression Analysis

We started our analysis with ordinary least square (OLS) regressions of the HCVP Survey respondents' neighborhood ratings on the poverty rate alone and then on all 35 census variables. Exhibit 9 shows selected regression fits. All of the regression fits were poor, but the combination of all 35 census variables explained 6.9 percent of the variation in the HCVP Survey respondents' neighborhood rating, a little more than twice the variation explained by the poverty rate alone (3.1 percent).

[6] The primary sources of census variables measuring neighborhood quality were from Devine et al. (2003), Feins and Patterson (2005), Galster, Hayes, and Johnson (2005), Holin et al. (2003), and Newman and Schnare (1997).

[7] The square of the correlation coefficient (in exhibit 8) is the percentage of the variation in the neighborhood rating that is explained by the census variable; that is, the square of the correlation coefficient is the same as the R-square from a regression of the neighborhood rating on that census variable and an intercept term.

Exhibit 8

Selected Census Variables

Selected Census Variables (as Percent)	Correlation to HCVP Neighborhood Rating	
	Sign	Correlation Coefficient
Households with female heads and own children under 18 years old	–	0.2160
Tract median household income relative to county median household income	+	0.1892
People with income twice or more the poverty level	+	0.1867
People 15 years old or older who are married females	+	0.1836
Families with related children under 18 years old	–	0.1827
Households receiving public assistance income	–	0.1798
People with income lower than the poverty level (poverty rate)	–	0.1780
Housing units that are owner occupied	+	0.1780
Housing units without vehicles	–	0.1720
People who are non-Hispanic Whites	+	0.1671
Civilian people 16 years old or older who are unemployed	–	0.1620
Civilian people 16 years old or older in managerial, professional, and technical employment	+	0.1552
People who are non-Hispanic Blacks	–	0.1541
People 25 years old or older without a high school diploma	–	0.1437
People who are 9 years old or younger	–	0.1391
People 25 years old or older with a college degree or more education	+	0.1289
People 16 to 19 years old who are high school dropouts	–	0.1273
Civilian uninstitutionalized people 5 years old or older who are disabled	–	0.1259
People 16 to 19 years old who are in school	+	0.1217
Households with heads under 35 years old	–	0.1137
Median gross rent to median value of owner-occupied housing (capitalization rate)	–	0.1106
Housing units (with heads 15 years old or older) that households moved into more than 5 years ago	+	0.1091
Housing units built since 1980	+	0.1052
Households with heads older than 65 years old	+	0.0944
Tract median value of owner-occupied housing relative to county value of owner-occupied housing	+	0.0857
Housing units built before 1940	–	0.0834
People who are 10 to 19 years old	–	0.0796
People who are citizens	+	0.0708
People who are Hispanics	–	0.0535
Civilian people 16 years old or older who are in the labor force	+	0.0470
Housing units that are vacant	–	0.0442
Housing units in single-family structures (1–4 units)	+	0.0385
Housing units that households moved into between 1995 and 1998	+	0.0383
Housing units without plumbing	–	0.0319
Households with wage or salary income	+	0.0048

HCVP = Housing Choice Voucher Program.

Note: The sample includes a random one-fourth of 418,308 survey respondents who provided neighborhood ratings and could match their data to census data at the census tract level (n = 104,850).

Sources: HCVP Customer Satisfaction Survey, 2000, 2001, and 2002; 2000 Decennial Census

Exhibit 9

Regressions of HCVP Survey Respondents' Neighborhood Rating

Independent Variables	R^2
OLS regressions	
Poverty rate	0.0309
Percentiles of poverty rate	0.0367
All 35 census variables	0.0693
Percentiles of all 35 census variables	0.0696
Ordered logisitic regressions	
Poverty rate	0.0218

HCVP = Housing Choice Voucher Program. OLS = ordinary least square.

Note: The sample includes a random one-fourth of 418,308 survey respondents who provided neighborhood ratings and could have their records matched to census data at the census tract level (n = 104,850).

Sources: HCVP Customer Satisfaction Survey, 2000, 2001, and 2002; 2000 Decennial Census

We then changed the continuous independent variables into categorical variables based on percentiles, deciles, quintiles, and quartiles, and we performed regressions again for each of these methods of categorizing the census variables; however, these categorical variables could not improve the regression fit. In other words, categorizing each census variable into as many as 100 categories each (that is, the percentiles) did not improve the explanatory power of the regression. We also performed ordered logistic regressions to investigate other functional forms, but ordered logistic regressions fit worse than OLS regressions. Exhibit 9 shows the R-square from a typical ordered logistic regression.

Paring Down Census Variables

Because of their poor fit, none of the regression models we tried could predict the HCVP Survey respondents' neighborhood ratings well. Another way to improve the accuracy of predicting the HCVP ratings was to categorize census variables and then create appropriate interaction terms, but the list of 35 census variables needed to be pared further to effectively explore this method. First, we conducted an exploratory factor analysis to identify census variables representing different neighborhood dimensions.[8] We could identify six distinct factors and a handful of census variables that highly influenced these factors.[9]

We used the results of the exploratory factor analysis plus correlation and distribution analyses to calculate a 6-point scale to further pare down the number of census variables. Every census

[8] The exploratory factor analysis we conducted is similar to the one reported in Galster, Hayes, and Johnson (2005). We included factors with eigenvalues higher than 1.5 and performed both Varimax and Promax rotations. We selected the Varimax rotation because the interfactor correlations in the Promax rotation were low and factor loadings were similar in both rotations using a cutoff of 0.45.

[9] We created six distinct factors using the standardized values of the 35 census variables and their weight coefficient determined through the factor analysis. When we regressed the Housing Choice Voucher Program neighborhood rating to the 6 factors, the fit was weaker than the ordinary least squares regression using all 35 census variables. This result was expected, considering the reduction in the number of dependent variables from 35 census variables to 6 factors.

variable received a point for each of the six criteria that it met. Exhibit 10 describes these criteria. The maximum number of possible points a variable could receive was 6, and we selected census variables that received 3 or more points. A handful of the selected variables still measured similar aspects of the neighborhood, as indicated by the factor analysis; thus, we excluded some of those variables if either criterion A or D was not satisfied.

After this selection process, we retained the following 11 census variables:

- Percentage of people living below the poverty level.
- Percentage of people with income two or more times the poverty level.
- Percentage of households headed by a female with own children under 18 years old.
- Percentage of housing units that are owner occupied.
- Ratio of census tract median household income to county median household income.
- Percentage of people 16 years or older who are unemployed.
- Percentage of people who are White.
- Percentage of people 16 years or older in professional jobs.
- Percentage of people 25 or older without a high school diploma.
- Percentage of housing units without vehicles.
- Percentage of households receiving public assistance income.

We then performed an OLS regression of the HCVP neighborhood rating to these 11 census variables to test the fit and discovered that the percentage of people with incomes twice or more the poverty level and the percentage of households receiving public assistance income were

Exhibit 10

Qualifying Criteria for Further Selection of Census Variables

Point	Qualifying Criteria for Census Variables
A	1 if the correlation coefficient with HCVP neighborhood rating is 0.15 or above (15 variables qualified)
B	1 if the correlation with HCVP neighborhood rating is the highest in the category, such as housing type or race (10 variables qualified, 1 in each category)
C	1 if R^2 is 0.5 or above when the variable is regressed with the factor it loads (22 variables qualified)
D	1 if the variable has the highest R^2 in regresssion with the factor it loads (6 variables qualified)
E	1 if the difference in average for HCVP neighborhood ratings 4 and 10 were the highest (10 variables qualified)
F	1 if the percentage point difference in the distribution of HCVP neighborhood ratings 4 and 10 was greater than 20 when binary variable was created using the sample mean as the average (8 variables qualified)
Total	**A + B + C + D + E + F**

HCVP = Housing Choice Voucher Program.

diminishing the effect of the poverty rate on the HCVP neighborhood rating without improving the fit (R-square was 0.0611). In other words, those two variables were not adding explanatory power; therefore, we excluded those two variables, retaining nine census variables for creating categories and interaction terms.

Creation of Census-Based Measures

We tested various ways of categorizing the nine selected census variables and creating interaction terms. The most promising method we found was to create binary variables that could be added to create interaction terms.

First, we created standardized binary census variables to indicate more favorable neighborhood attributes, designated as 1. We used the following six cutoffs for each variable: (1) sample averages to indicate neighborhoods that were better than the sample average, (2) national averages to indicate neighborhoods that were better than the national average, (3) sample medians to indicate neighborhoods that were better than half or more of the sample neighborhoods, (4) sample 25th percentiles to indicate neighborhoods that were better than 25 percent of the sample neighborhoods, (5) sample 75th percentiles to indicate neighborhoods that were better than 75 percent of the sample neighborhoods, and (6) sample 10th percentiles to indicate neighborhoods that were better than 10 percent of the sample neighborhoods.

The distributions of HCVP neighborhood rating appeared somewhat similar across broad categories (0 to 9 "good" attributes) of the scores, with minimal but consistent variation across scores. That is, the distributions of various scores for each of the 10 HCVP neighborhood ratings varied but were somewhat clumped in the middle (4 or 5 "good" attributes). We were able, however, to exploit the distributions of the various scores and collapse the HCVP neighborhood ratings based on the location of the median score. The exact cutoffs varied somewhat for each type of score (that is., based on 25th percentile, based on 75th percentile, and so on) but the most sensible rule was to combine HCVP neighborhood ratings into four categories: 1 to 4, 5 or 6, 7 or 8, and 9 or 10.

We then added the binary census variables from the methods described above to create six score variables with the maximum possible value of 9 and the minimum possible value of 0. We compared each of the resulting variable scores with the HCVP Survey respondents' neighborhood ratings. The relationships were consistent between each of the six census scores and the HCVP Survey respondents' neighborhood ratings (that is, the census variable scores indicating more good attributes correlated consistently with the likelihood that respondents rated their neighborhoods higher); however, the relationship was not strong. This observation means that none of the six census scores met the objective of providing a census-based indicator of neighborhood quality that was highly correlated with the voucher holders' neighborhood ratings.

We also tested whether using the variable cutoffs as the 10th percentile values (better than only 10 percent of the neighborhoods) for the group of survey respondents with HCVP neighborhood ratings of 9 or 10 could be exploited to make a better prediction for the survey respondents with HCVP neighborhood ratings of 1 to 4. That is, we tried to identify the factors that would separate the worst rated neighborhoods from the best rated neighborhoods. We used a stepwise approach:

We selected the census variable with the highest difference in distributions between the highest and lowest groups of HCVP neighborhood ratings at each stage. This stepwise selection was unsuccessful in distinguishing between the highest and lowest groups of HCVP neighborhood ratings in any significant way. After the fourth stage, the difference in prediction between the groups of HCVP neighborhood ratings of 9 or 10 and 1 to 4 was less than 14 percentage points, and this difference grew by less than one-half a percentage point with the fourth variable added.

Finally, because the six census scores we created from the binary census variables were lacking in variation in the distribution—most of the observations had four or five positive attributes—we decided to add some of these scores together to create new scores. The goal was to create a new census score that had more variation and a stronger correlation with the voucher holder's neighborhood rating. After studying the correlations between combinations of the census scores and the HCVP neighborhood ratings, we picked the sum of the scores based on the 25th, 50th, and 75th percentiles of the sample for the cutoffs as our best census-based measure of neighborhood quality. This census score ranged from 0 to 27; in this score, neighborhoods above the 75th percentile received 3 points for a positive attribute, neighborhoods between the median and the 75th percentile received 2 points for a positive attribute, and neighborhoods between the 25th percentile and the median received 1 point for a positive attribute.

Results: Comparison of Poverty Rate and Combined Census-Based Measure of Neighborhood Quality To Predict Housing Choice Voucher Holders' Neighborhood Ratings

For a comparison, we first tested how the poverty rate predicted the HCVP neighborhood ratings. We grouped the poverty rate into four categories: 30 percent or more, between 20 and 29.99 percent, between 10 and 19.99 percent, and below 10 percent. We also grouped the neighborhood ratings into the following four categories:

- 1 to 4.
- 5 or 6.
- 7 or 8.
- 9 or 10.

The results are shown in exhibit 11. As can be seen in the poverty rate row of the exhibit, the poverty rate was a correct predictor in 33 percent of all neighborhood ratings, including—

- 22 percent of HCVP neighborhood ratings of 1 to 4.
- 24 percent of HCVP neighborhood ratings of 5 or 6.
- 41 percent of HCVP neighborhood ratings of 7 or 8.
- 34 percent of HCVP neighborhood ratings of 9 or 10.

The most common poverty rate category for each group of neighborhood ratings was 10 to 19.99 percent. In other words, under the maximum likelihood criteria, an HCVP neighborhood rating of 7 or 8 will be picked every time instead of the correct HCVP neighborhood rating.

Using the categories of the 0-to-27 census score as shown in exhibit 11, on the row "Census score (optimal—each HCVP rating category predicted equally accurately)," the prediction rate could be optimized so that each category of the HCVP neighborhood rating was predicted with similar accuracy. This census score correctly predicted 32 percent of all neighborhood ratings, including—

- 33 percent of HCVP neighborhood ratings of 1 to 4.
- 29 percent of HCVP neighborhood ratings of 5 or 6.
- 32 percent of HCVP neighborhood ratings of 7 or 8.
- 33 percent of HCVP neighborhood ratings of 9 or 10.

In addition, the same prediction rates would hold even when the maximum likelihood was used as the criteria.

We were also able to create categories of the census score that predicted the HCVP neighborhood rating slightly better than the poverty rate, as shown in exhibit 11, row "Census score (maximum overall accuracy)"; however, a neighborhood quality index should not be judged only by the higher overall prediction rate. Given the distribution of the HCVP neighborhood rating, an index that

Exhibit 11

Correct Prediction of HCVP Neighborhood Rating

Census Neighborhood Quality Indicator	HCVP Neighborhood Rating				Overall Correct Prediction
	1–4	5–6	7–8	9–10	
Poverty rate	(percent)				
30% or more	**21.9**	16.6	11.6	9.5	
20–29.99%	25.9	**24.0**	19.3	16.4	
10–19.99%	36.1	39.4	**40.9**	39.7	**33.26**
Less than 10%	16.1	20.0	28.2	**34.4**	
Total	100.0	100.0	100.0	100.0	
Census score (optimal—each HCVP rating category predicted equally accurately)	(percent)				
0–5	**33.3**	25.8	17.0	12.3	
6–12	28.4	**28.8**	26.2	22.1	
13–19	24.6	28.1	**31.9**	32.9	**31.75**
20–27	13.8	17.3	24.9	**32.7**	
Total	100.0	100.0	100.0	100.0	
Census score (maximum overall accuracy)	(percent)				
0–3	**24.3**	17.8	11.1	7.6	
4–9	25.9	**24.2**	19.8	15.5	
10–18	33.0	36.8	**39.4**	38.8	**34.43**
19–27	16.7	21.2	29.7	**38.1**	
Total	100.0	100.0	100.0	100.0	

HCVP = Housing Choice Voucher Program.

Notes: The sample includes a random one-fourth of 418,308 survey respondents who provided neighborhood ratings and could have their record matched to census data at the census tract level (n = 104,850). The bold numbers are the percentage of that neighborhood-rating category that is accurately categorized by the census neighborhood quality indicator.

Sources: HCVP Customer Satisfaction Survey, 2000, 2001, and 2002; 2000 Decennial Census

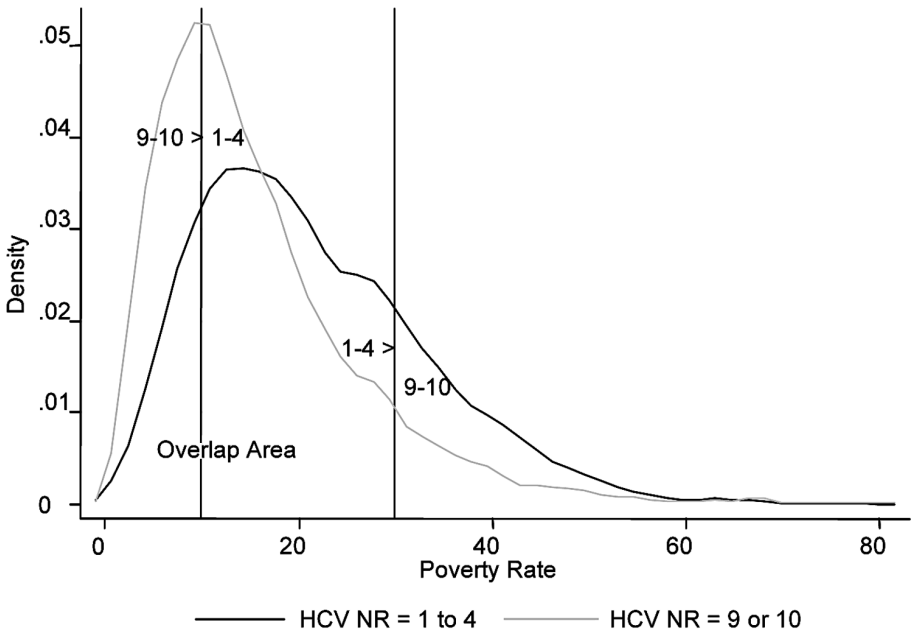
always picks a neighborhood rating of 9 or 10 is correct more than 40 percent of the time and an index that selects 7 to 10 is correct 70 percent of the time. On the other hand, these indices have zero prediction power for the lower neighborhood ratings; thus, optimizing the balance in predicting all levels of neighborhood quality should be preferred over maximizing the overall prediction.

Despite a slight improvement over the poverty rate, our census score is not a strong proxy for the HCVP neighborhood rating because it can predict the correct HCVP neighborhood rating only one-third of the time.

The reason for these results can be better understood by examining exhibits 12a and 12b. In exhibit 12a, we graphed the distribution of poverty rate for the Housing Choice Voucher holders' neighborhood rating (HCV NR) categories 1 through 4 (darker line) and the HCV NR categories 9 and 10 (lighter line). The two distributions had most of their areas under the curves in common, as shown by the area labeled "Overlap Area"; hence, the poverty rate is not very effective in distinguishing between the lowest and highest categories of neighborhood rating. The first vertical line separated the lowest poverty group (less than 10 percent) to its left. More than half of the area under the lighter line (HCV NR 9 or 10) was also under the darker line (HCV NR 1 through 4). The second vertical line separated the highest poverty group (greater than or equal to 30 percent).

Exhibit 12a

Distribution of Poverty Rate for HCVP Neighborhood Rating Categories 1 to 4 and 9 or 10



HCV NR = Housing Choice Voucher holders' neighborhood rating. HCVP = Housing Choice Voucher Program.

Note: The sample includes a random one-fourth of 418,308 survey respondents who provided neighborhood ratings and could match their data to census data at the census tract level (n = 104,850).

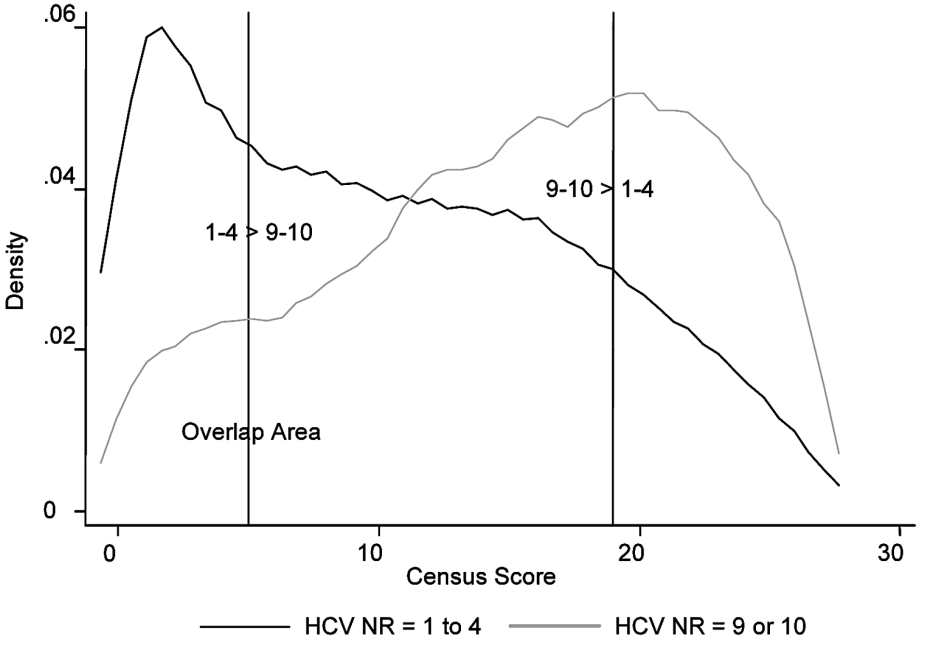
Sources: HCVP Customer Satisfaction Survey, 2000, 2001, and 2002; 2000 Decennial Census

About one-half of the area under the darker line (HCV NR 1 through 4) was also under the lighter line (HCV NR 9 or 10). The commonality in the middle area between the two vertical lines is even more severe.

In Exhibit 12b, we graphed the distribution of our census score for the HCV NR categories 1 through 4 (darker line) and the HCV NR categories 9 and 10 (lighter line) The two distributions had most of their areas under the curves in common, but the area of commonality is slightly reduced compared with the poverty rate. The first vertical line separated the lowest census score group (less than or equal to 5) to its left. Less than half of the area under the lighter line (HCV NR 9 or 10) was also under the darker line (HCV NR 1 through 4). The second vertical line separated the highest census score group (20 through 27). Less than half of the area under the darker line (HCV NR 1 through 4) was also under the lighter line (HCV NR 9 or 10). This distribution was a modest improvement over the poverty rate.

Exhibit 12b

Distribution of Census Score for HCVP Neighborhood Rating Categories 1 to 4 and 9 or 10



HCV NR = Housing Choice Voucher holders' neighborhood rating. HCVP = Housing Choice Voucher Program.

Note: The sample includes a random one-fourth of 418,308 survey respondents who provided neighborhood ratings and could match their data to census data at the census tract level (n = 104,850).

Sources: HCVP Customer Satisfaction Survey, 2000, 2001, and 2002; 2000 Decennial Census

Conclusion

We did not find a census-based housing quality measure that is highly correlated with voucher holders' ratings of the quality of their neighborhoods. The census tract poverty rate—the most common census measure of neighborhood quality in the research literature—does almost as well by itself as the more complex measures that draw on multiple census variables.

At this point, the question arises regarding whether the voucher holder respondents are rating their neighborhoods or rating something else, such as their housing or their living situation. The neighborhood ratings were highly correlated with voucher holders' responses about specific neighborhood attributes, such as problems with crime, trash on the streets, and vacant lots. This consistent relationship suggests that the neighborhood ratings do indeed reflect the respondents' perceptions of their neighborhoods.

We believe two other reasons more likely explain why the census variables we tested are not highly correlated with voucher holders' neighborhood ratings. First, the neighborhood that voucher holders are rating may not coincide with a census tract. The neighborhood may be smaller or larger or be an area that crosses census tract boundaries. Additional research could test whether census variables at the block level are more correlated with voucher holders' ratings. Second, perhaps the census variables we tested are not the attributes that drive voucher holders' ratings. We tested a comprehensive list of census variables, and, thus, it may be neighborhood attributes that are not captured by the census. With the high correlation between voucher holders' ratings of their neighborhoods and their indicated perception of crime, neighborhood measures that use the crime rate might be more strongly correlated with neighborhood ratings. Based on the research of Galster, Hayes, and Johnson (2005), neighborhood measures based on home loan applications, the size of loans, and business activity may be more appropriate indicators than census-based variables of neighborhood quality. Followup conversations or cognitive testing would be efficient ways to understand whether the census variables we tested are not strongly correlated with voucher holders' ratings because the census tract is not the geography they are basing their neighborhood ratings on or because the census data does not capture the factors that are determining their neighborhood ratings.

Appendix

Exhibit A-1

Averages of Decennial Census 2000 Variables by Overall Neighborhood Rating

Census Variables	Correlation	Average by Neighborhood Rating									
		1	2	3	4	5	6	7	8	9	10
Sample Size		7,107	5,404	12,150	17,939	49,136	32,486	54,199	82,320	55,424	102,155
Household type						(percent)					
Households with female heads and own children under 18 years old	– 0.2160	13	12	12	12	11	11	10	9	9	8
Households with female heads	– 0.2077	21	19	19	18	17	17	16	15	14	14
People 15 years old or older who are married females	0.1836	23	24	24	24	25	25	25	26	27	27
Families with related children under 18 years old	– 0.1827	59	58	58	58	57	56	55	54	53	53
Households with own children under 18 years old	– 0.0619	35	34	34	34	34	33	33	33	33	32
Age						(percent)					
People who are 9 years old or younger	– 0.1391	16	16	15	15	15	15	15	14	14	14
Households with heads under 35 years old	– 0.1137	26	26	27	27	26	26	25	25	24	23
Households with heads older than 65 years old	0.0944	21	21	21	21	21	22	22	22	23	23
People who are 10 to 19 years old	– 0.0796	15	15	15	15	15	15	14	14	14	14
Ethnicity/race						(percent)					
People who are non-Hispanic Whites	0.1671	49	54	57	58	60	62	65	68	70	71
People who are minorities	– 0.1671	51	46	43	42	40	38	35	32	30	29
Households with minority heads	– 0.1646	47	41	39	38	36	34	31	28	26	25
People who are non-Hispanic Blacks	– 0.1541	31	26	24	23	21	20	17	15	13	13
People who are not Whites, Blacks, Hispanics, Asians, or Native Americans	– 0.0641	2	2	2	2	2	2	2	2	2	2
People who are Hispanics	– 0.0535	15	15	14	14	14	13	12	12	11	11
People who are not Whites, Blacks, or Hispanics	– 0.0214	5	5	5	5	5	5	5	5	5	5
People who are Native Americans	– 0.0110	1	1	1	1	1	1	1	1	1	1
People who are Asians	0.0022	2	2	2	2	2	2	2	2	3	2

Exhibit A-1

Averages of Decennial Census 2000 Variables by Overall Neighborhood Rating (continued)

Census Variables	Average by Neighborhood Rating										
	Correlation	1	2	3	4	5	6	7	8	9	10
Education						(percent)					
People 25 years old or older who are high school dropouts	– 0.1704	19	17	17	17	16	16	15	14	14	14
People 16 to 19 years old who are high school dropouts	– 0.1273	16	15	15	15	14	13	13	12	11	11
People 16 to 19 years old who are in school	0.1217	72	72	73	73	73	74	75	76	77	77
People 25 years old or older with some college education or more	0.1205	38	40	41	41	41	42	44	45	46	45
People 25 years old or older without a high school diploma	– 0.0825	12	11	11	10	10	10	9	9	9	9
People 25 years old or older with some college education	0.0309	19	20	20	20	20	20	21	21	21	20
People 25 years old or older with a high school diploma	– 0.0062	31	32	32	32	32	32	32	32	32	32
Immigration						(percent)					
People who are citizens	0.0708	93	93	93	93	94	94	94	94	95	95
People who are noncitizens	– 0.0708	7	7	7	7	6	6	6	6	5	5
People who are natural-born citizens	0.0494	90	90	90	90	90	91	91	91	92	92
People who are foreign born	– 0.0494	10	10	10	10	10	9	9	9	8	8
People who are foreign-born citizens	0.0011	3	3	3	3	3	3	3	3	3	3
Institutionalization						(percent)					
Civilian uninstitutionalized people 5 years old or older who are disabled	– 0.1259	25	24	24	24	24	23	23	22	22	22
People who are institutionalized	0.0072	2	2	2	2	2	2	2	2	2	2

Exhibit A-1

Averages of Decennial Census 2000 Variables by Overall Neighborhood Rating (continued)

Census Variables	Average by Neighborhood Rating										
	Correlation	1	2	3	4	5	6	7	8	9	10
Labor force						(percent)					
Civilian people 16 years old or older who are unemployed	– 0.1620	6	5	5	5	5	5	5	4	4	4
Civilian people 16 years old or older in managerial, professional, and technical employment	0.1552	23	24	24	24	25	25	26	27	28	28
Males 16 years old or older who are not working at least part time more than 26 weeks	– 0.0786	11	11	11	10	10	10	10	10	10	10
Civilian people 16 years old or older who are in the labor force	0.0470	60	61	61	61	61	62	62	62	63	62
Income						(percent)					
People with income twice or more the poverty level	0.1867	52	55	55	56	57	58	61	62	64	64
Households receiving public assistance income	– 0.1798	7	7	7	6	6	6	5	5	4	4
People with income lower than the poverty level	– 0.1780	24	22	21	21	20	19	18	17	16	16
Housing units without vehicles	– 0.1720	20	18	17	17	16	15	14	13	12	12
						(US$)					
Median household income	0.1500	29,658	30,878	31,330	31,541	32,044	32,879	34,119	35,083	36,446	36,390
						(percent)					
Households with wage or salary income	0.0048	74	75	75	75	75	75	75	75	75	75
Housing costs						(percent)					
Median gross rent to median value of owner-occupied housing (capitalization rate)	– 0.1106	0.68	0.67	0.66	0.66	0.65	0.64	0.62	0.61	0.59	0.59
						(US$)					
Median value of owner-occupied housing units	0.0857	87,775	91,230	92,375	92,101	93,413	96,539	100,696	102,769	107,370	107,219
Median gross monthly rent	0.0506	508	521	522	522	522	530	538	540	548	542
Median monthly rent	0.0222	430	446	443	446	442	450	457	457	461	455

Exhibit A-1

Averages of Decennial Census 2000 Variables by Overall Neighborhood Rating (continued)

Census Variables	Correlation	Average by Neighborhood Rating									
		1	2	3	4	5	6	7	8	9	10
Housing market		(percent)									
Housing units that are owner occupied	0.1780	49	50	51	51	53	54	55	57	60	61
Housing units (with heads 15 years old or older) that households moved into more than 5 years ago	0.1091	47	47	47	47	48	48	48	49	50	51
Housing units built since 1980	0.1052	21	22	22	22	22	22	24	25	27	27
Housing units built since 1970	0.0990	38	39	39	39	39	39	41	43	45	45
Housing units built before 1940	– 0.0834	33	32	33	33	32	32	31	29	28	27
Housing units that are vacant	– 0.0442	10	10	9	9	9	9	9	9	8	9
Housing units in single-family structures (1–4 units)	0.0385	73	74	74	74	74	75	75	75	76	76
Housing units that households moved into between 1995 and 1998	0.0383	21	22	22	22	22	22	23	23	23	23
Housing units without plumbing	– 0.0319	1	1	1	1	1	1	1	1	1	1
Census tract matches		95	95	96	95	95	95	95	95	94	93

Note: The sample includes all survey respondents who provided neighborhood ratings and could match their data to census data at census tract level (n = 418,308).

Sources: Housing Choice Voucher Program Customer Satisfaction Survey, 2000, 2001, and 2002; 2000 Decennial Census

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Housing in the Nation's Micropolitan Areas: A First Look

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Abstract

Micropolitan area is a newly defined unit of analysis for examining housing affordability. Before the creation of micropolitan areas in 2003, U.S. counties were categorized as either metropolitan or nonmetropolitan. The category of micropolitan area allows for a more detailed analysis of housing affordability conditions in areas with populations less than metropolitan areas but more than nonmetropolitan areas. Variables examined in this analysis of micropolitan areas include demographic and housing characteristics. A policy section highlights how the findings from this analysis may be applied to micropolitan geography.

Introduction

This article is a first-ever look at housing conditions and affordability in the nation's micropolitan areas. *Micropolitan area* is a newly defined Census Bureau (Census) geography term introduced in June 2003 (OMB, 2003) and updated in December 2003, November 2004, and December 2005.[1] Before the creation of micropolitan areas, all counties in the United States were designated as either metropolitan or nonmetropolitan; use of the term *micropolitan area* offers a gradation between these two endpoint areas in terms of urban qualities.[2]

[1] This new designation uses 2000 Census data as a reference point. In 2000, the new core-based statistical areas (CBSAs) replaced metropolitan statistical areas (MSAs), consolidated metropolitan statistical areas (CMSAs), and primary metropolitan statistical areas (PMSAs). CBSAs define both micropolitan and metropolitan areas. Because of the unusual timing in the release of this definition, many researchers remain unaware that the metropolitan definitions have shifted away from the traditional CMSAs and PMSAs.

[2] Depending on the location of principal cities and commuting relationships between counties, all counties are now designated as metropolitan (in a metropolitan statistical area), micropolitan (in a micropolitan statistical area), or noncore (not in either type of statistical area). As such, noncore counties can be assumed to be sparsely populated and not connected with any surrounding urbanization.

The Census Bureau currently identifies 573 micropolitan areas, accounting for 690 out of 3,141 U.S. counties. These places represent a significant new area of study because more than 28.3 million people live in micropolitan areas, which amounts to more than one-fifth of U.S. counties and one-tenth of the nation's total population. Because micropolitan areas are a transition category between city and country, micropolitan areas have only two-thirds as many housing units in Census-defined urban areas compared with the nation as a whole (51.6 and 77.6 percent, respectively).[3] Micropolitan areas also have roughly double the percentage of Census-defined rural housing units as the entire United States.

The introduction of micropolitan areas significantly redefines census geography. With this new definition, more than half the land in the continental United States is now officially designated as "core based"; that is, it is designated either micropolitan or metropolitan by the Census Bureau. With the addition of micropolitan areas, much more U.S. land area falls into urban areas, or core-based areas, rather than into noncore-based areas. In 1890, America's Census-designated frontier closed as settlement swept into remote corners of the nation. As defined by the Census Bureau, the United States became majority urban by 1920 for the first time in its history. At mid-20th century, more than half of the U.S. population lived in metropolitan areas. By the 1970 Census, the United States had become a suburban-dominated nation, with more than half of all metropolitan residents living outside central cities.[4] Now a new milestone has been reached: as of 2000, noncore-based areas cover less than half the continental United States.

As might be expected, the academic literature on the subject is very limited because of the newness of the micropolitan area definition (Frey et al., 2004; Lang and Dhavale, 2004, 2006). Nevertheless, this new geography already has been embraced elsewhere. The media, local governments, and policymakers have started adopting and using the micropolitan area designation, and businesses, government agencies, and planners are working with a new geography. Publications took notice; *Site Selection Magazine*, for example, started a list of "Top Micropolitans" in which to locate businesses (Starner, 2005).

Because micropolitan areas are so new, this article begins by examining micropolitan definitions and geography. Micropolitan geography is also a key determinate of housing conditions, including affordability. The article then turns to the methods used to examine micropolitan housing conditions and affordability, followed by an overview of general housing conditions in micropolitan areas. The next section then addresses the least and most affordable micropolitan areas. The article concludes by analyzing some policy implications raised by the data analysis.

Micropolitan Geography

Similar to metropolitan areas, micropolitan areas are constructed from counties containing the population center and any surrounding counties with commuting relationships with the central

[3] The Census Bureau (Census) defines rural places using population density; therefore, a nonmetropolitan or noncore designation is not synonymous with rural. In this article, we use the terms "urban" and "metropolitan" interchangeably, as well as "rural" and "nonmetropolitan." Every use of the Census-designated definition of urban or rural is explicitly noted in the text.

[4] For a fuller discussion of these key transitions, see Lang, Popper, and Popper (1997, 1995) and Katz and Lang (2003).

county or counties. The only difference is in the size of the city; the micropolitan principal cities[5] include populations of 10,000 to 49,999, while the populations of metropolitan principal cities are greater than 50,000. A statistical area may be anchored by more than one principal city.

Micropolitan areas can be populous regions but without large cores, while metropolitan areas may have large cores that are surrounded by little additional population. An area is defined as metropolitan or micropolitan based on the size of its center rather than its total population (Frey et al., 2004). This definition raises important research questions about how to determine what is urban based on previous notions of urbanization. The traditional view holds that an original large-core city anchors subsequent suburbanization and creates a metropolitan area. The big micropolitan areas reverse this standard pattern because they grew to a metropolitan scale without a large central city.

Some of the largest micropolitan areas are more than just overgrown small towns—they appear to be exemplars of a new decentralized or even countrified city. Most research on decentralized cities (for example, edge cities and edgeless cities) examines the places that have grown next to traditional cores, such as the Tysons Corner area outside Washington, D.C. (Garreau, 1991; Lang, 2003). Yet the suburban growth in large micropolitan areas is not outside anything because there is no real center to be outside of—and no *urban* to be a *sub* of. In this way, the micropolitan growth represents a new metropolitan form with an expansive periphery and a relatively small core.

Micropolitan areas fall between metropolitan and rural areas in their urban qualities (Lang and Dhavale, 2004, 2006). They lack the large central city (more than 50,000 residents) that the Office of Management and Budget requires as a criterion for being a metropolitan area. By contrast, micropolitan areas have central cities that compare with modest-sized towns.[6] As with metropolitan areas, micropolitan areas are quite diverse. As the term *micropolitan* implies, these places are generally, but not always, less populous than metropolitan areas; however, large micropolitan areas can exceed small metropolitan areas in total population. In fact, the largest micropolitan area (Torrington, CT) outranks 103 of the smallest metropolitan areas (out of 276); therefore, micropolitan areas and metropolitan areas substantially overlap.

We can measure the suburb-to-center city relationship in both metropolitan and micropolitan areas. The ratio of center city populations to their suburbs has been tracked back to 1910 (U.S. Census Bureau, 2002). In the first decade of the 20th century, central cities dominated the metropolis, accounting for three-fourths of all people in the region. By 2000, the roles had been reversed, with just 37.7 percent of metropolitan residents living in central cities. In comparison, an analysis of

[5] Changes to how the Census Bureau classifies places in 2003, however, have eliminated the category "central cities" (Frey et al., 2004; OMB, 2003). The new definitions relabel all of what were previously classified as central cities, plus some other places, as "principal cities," demonstrating the Census Bureau's awareness that important cities need not be central to their metropolitan regions. In fact, a principal city need not even be an incorporated place. For example, Paradise, Nevada, (a principal city in the Las Vegas/Paradise, NV Metropolitan Statistical Area) is only a "Census-designated place" carved out of unincorporated Clark County, Nevada (Lang and Dhavale, 2003).

[6] The Office of Management and Budget definition for a micropolitan area is "at least one urban cluster of at least 10,000 but less than 50,000 in population," although more than 50,000 residents can live in the entire micropolitan statistical area. As with metropolitan areas, micropolitan areas are constructed from counties containing the population center and from those that have commuting relationships with the central county. (Available at http://www.census.gov/population/www/estimates/aboutmetro.html.)

micropolitan areas reveals that their central cities are even more modest relative to their suburbs: only 31.6 percent of micropolitan area residents live in the area's core (Lang and Dhavale, 2004).

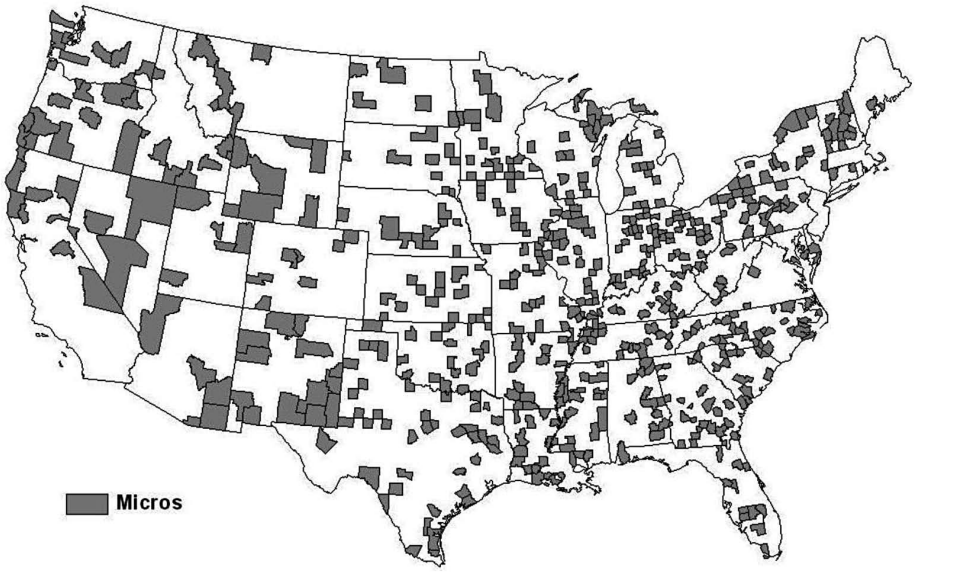
Micropolitan areas reflect U.S. regional differences. Metropolitan and micropolitan areas substantially fill in the eastern half of the nation. The only big spaces left in the East without micropolitan areas are the upper Great Lakes, northern Maine, and the central Appalachian Mountains. A state such as Vermont, which has few metropolitan counties, is full of micropolitan ones. In southeastern states from Mississippi to North Carolina, substantial micropolitan zones now complement metropolitan areas. So extensive is the urban coverage of the East that if a driver traveled the entire length of Interstate 95 from Maine to Florida, he or she would pass through only five noncore-based counties.

By contrast, significant stretches of the West are without urban places. The Great Plains and the northern Rockies have large rural gaps between their micropolitan areas and metropolitan areas; however, the Interstate highways that pass through the Rockies and Great Plains often support multiple micropolitan areas along their lengths.

The differences between East and West also hint at the role that micropolitan areas play in regional development. In the East, micropolitan areas seem to be small-scale urban fillers between bigger metropolitan areas, while in the West, micropolitan areas may be central places that anchor economic development across a broad area. This difference could affect conditions such as housing affordability in micropolitan areas. For example, micropolitan areas in the East that are essentially exurbs to large metropolitan areas may face future housing cost pressures as their metropolitan neighbors continue to sprawl. Micropolitan areas currently number 49 in the Northeast, 235 in the South, 206 in the Midwest, and 64 in the West. Exhibit 1 shows the distribution of micropolitan areas.

Exhibit 1

Micropolitan Regional Distribution



Methods

The Census Bureau identifies 573 micropolitan areas. This analysis of housing conditions and affordability focuses on the 567 micropolitan areas in the coterminous United States. The micropolitan areas in Alaska, Hawaii, and Puerto Rico are excluded because preliminary analyses show these places to be outliers. For example, some very remote micropolitan areas in Alaska are actually closer to Seattle, Washington, than to Anchorage, Alaska. In Hawaii, three entire islands are micropolitan areas. To compare micropolitan areas and their housing conditions, this analysis concentrates on the continental United States.

In the first part of the analysis, we focus on three demographic dimensions of micropolitan areas—size, growth, and location—thus establishing a baseline of micropolitan geography. In the second part of the analysis, we examine the relationship between affordability and housing conditions in the micropolitan areas.

Data Sources

The definitions of the micropolitan areas come directly from the Census Bureau (OMB, 2003), as do the population data (U.S. Census Bureau, 2004). The housing information and variables come from the 2000 Census long-form compilation. The data are obtained at the county level for two reasons: (1) counties are the building blocks for micropolitan areas and (2) the Census Bureau currently is not reporting data at the micropolitan level. Because some micropolitan areas are composites of multiple counties, we used a weighted average to obtain micropolitan-level data.

Population size and growth are the first micropolitan characteristics we discuss to establish a basic micropolitan area typology. We use location as a remoteness indicator that measures the distance between the center of a micropolitan area and the center of a big metropolitan area.[7] *Big* refers to metropolitan areas with more than 1 million residents, which describes the top 50 U.S. regions ranging in size from Richmond, Virginia, with a population of slightly more than 1 million, to New York City, with a population of more than 21 million.[8]

The big 50 metropolitan areas, which alone account for more than half of the U.S. population, are home to key transportation infrastructure, such as hub airports. Distance from these metropolitan areas, which are also the nation's economic engines, puts remote micropolitan areas at a locational disadvantage. The 25 most remote micropolitan areas are at least 275 miles from a large metropolitan area, which means their residents must drive 4 or more hours to reach big-city services and amenities. As discussed in the next section, micropolitan areas near large metropolitan areas tend to be larger and faster growing, while the more remote places are often smaller and slower growing. This finding is consistent with demographer Calvin Beale's work that established remoteness as a key indicator of metropolitan development (Beale, 1990). Remoteness (and what it implies about access) is a key concept in rural geography, and remoteness should apply to this new small-scale urban form.

[7] The remoteness measure was done by calculating the distance from the centroids of micropolitan areas to the centroids of metropolitan areas in ArcView 3.3. For a longer discussion of the remoteness measurement see Lang (2002) and Lang, Popper, and Popper (1997).

[8] Because this study focuses on the United States, San Juan, Puerto Rico, was replaced with the next largest city, Richmond, Virginia.

Micropolitan Affordability Index

The Micropolitan Affordability Index (MAI) calculated and used in this article applies assumptions similar to those used in the National Association of Home Builders-Wells Fargo Housing Opportunity Index (HOI). The HOI computes the portion of homes in each metropolitan area and region that are affordable to a family with a median household income.[9] The MAI computes a similar index, with the focus being solely on micropolitan areas and homeownership. The MAI is the percentage of households that can purchase a median-priced home; the HOI and MAI provide different but complementary statistics about the affordability of housing. The HOI shows the share of homes sold that could be purchased with a median income. The MAI indicates the percentage of households that can afford a median-priced home for each micropolitan area.

Because the micropolitan areas are a brand new geography, data for these places are not nearly as developed as for metropolitan areas, which have existed as a census category for more than half a century. No trade group data sources are available on micropolitan housing similar to those produced for metropolitan areas by national organizations such as the NATIONAL ASSOCIATION OF REALTORS® or the National Association of Home Builders. The data for the micropolitan housing came from the Census Bureau's long-form compilations. These data were collected on April 1, 2000. Although the housing data obviously are not current, they nonetheless show the historic *relative* condition of micropolitan housing. These data are important for framing the basic housing costs and characteristics in these areas.

When possible, the data types and underlying assumptions for the MAI closely match the HOI. The formula assumes a 30-year, fixed-rate loan for 90 percent of the sale price with a 10-percent downpayment. The interest rate used to calculate payments was 7.25 percent—an average interest rate in 1999.[10] The rate was obtained from the Federal Housing Finance Board Monthly Interest Rate Survey, which is an average of the effective interest rates offered for conventional single-family mortgages during that period. We obtained median real estate taxes from the Census Bureau, as well as the categorized gross incomes of micropolitan households and median house values, which we used to approximate the cost of purchasing a new home. The monthly payment amount incorporates principal, interest, and real estate taxes. Property and mortgage insurance are not included in the total.

The MAI formula takes both total loan amount and household income into account. We computed a 30-year loan schedule for a median monthly payment based on the costs of homeownership—loan interest, principal, and taxes—for each micropolitan area. We used the payment amount to determine a required yearly salary necessary to pay less than 28 percent of gross income for housing. As with the HOI, the MAI considers housing affordable when no more than 28 percent of gross income is spent on housing. We then tallied the total number of households earning more than the amount of that required yearly threshold. We compared this result to the total number of

[9] For a more complete background on the Housing Opportunity Index and a description of its methodology, see http://www.nahb.org/generic.aspx?sectionID=135&genericContentID=533. This index is a rough measure of affordability, and it does not include other costs associated with mortgages, such as mortgage insurance. In addition, the census data used to derive this data do not have detailed housing costs available for analysis.

[10] Although the decennial census was taken in April 2000, the collected median income and housing data are from 1999.

households, arriving at the percentage of households in each micropolitan area capable of buying a median-priced home. Thus, the MAI is the percentage of households in each micropolitan area that can afford the median cost of housing considering the incomes actually available. The HOI is slightly different because it determines the percentage of housing available to a family with the median income.

Micropolitan Housing Conditions—The Top Ten Micropolitan Areas by Type

As discussed in Lang and Dhavale (2004, 2006), micropolitan areas vary greatly on three key demographic variables—size, growth rate, and remoteness. These variables enable researchers to capture the essence of micropolitan areas and understand some of the forces that might be at work. This analysis takes those basic variables further and examines other variables that influence housing affordability. We examine the relationship between housing affordability, as calculated by the MAI, and demographic and housing variables associated with affordability—housing type, age, and size. Because of the difficulty of conceptualizing trends in hundreds of places, we use top 10 lists to illustrate some of the most and least affordable micropolitan areas.

In total, the micropolitan areas contain 12,944,559 housing units, or 11.2 percent of the nation's housing stock. Exhibit 2, which summarizes micropolitan housing statistics, shows that micropolitan areas have a higher percentage of single-family detached units than the United States as a whole. Micropolitan areas also have more than double the percentage of manufactured homes than the nation as a whole (15 and 7.6 percent, respectively). The micropolitan housing stock is roughly comparable in age to the national housing stock; the median age for both hovers around 15 years, with a median building date of 1971. Micropolitan area housing size as distributed is comparable with U.S. averages in number of bedrooms and total number of rooms per dwelling (14.5 percent of micropolitan homes and 16.9 percent of national homes have four or more bedrooms; 6.8 percent of micropolitan homes and 7.7 percent of national homes have nine or more total rooms). The micropolitan areas slightly lag the nation in the percentage of owner-occupied units.

Exhibit 2

U.S. and Micropolitan Area Housing Summary

	Affordable Housing (MAI) (percent)	Owner-Occupied Housing Units (percent)	Detached Single-Family Homes (percent)	Manu-factured Housing Units (percent)	Median Manu-factured Home Value (US$)	Median Home Value (US$)	Median Year Built	Nine or More Rooms (percent)
Micropolitan area	63.0	63.0	68.8	15.0	30,900	78,461	1969	6.8
United States	58.5	66.2	60.3	7.6	31,200	111,800	1971	7.7

MAI = Micropolitan Affordability Index.

The Least and Most Affordable Micropolitan Areas

The following top 10 lists, which show micropolitan areas that are most and least affordable, based on MAI, are useful analyses of hundreds of micropolitan areas, and they illustrate some key findings.

Affordability is a component of house price, household income, and a monthly payment consisting of principal, interest, taxes, and insurance. The micropolitan median house value (as of 2000) is about 70 percent that of the United States house value ($78,461 and $111,800, respectively). In 2000, the $34,234 median income in the micropolitan areas was about 80 percent of the U.S. median income of $41,994, which translated into more affordable housing in the micropolitan areas. Affordability in micropolitan areas ranges from a low of 16 percent in the Jackson, WY-ID area to a high of 81.6 percent in the Borger, TX area. In other words, fewer than one in six households in the Jackson, WY-ID area could afford a median-priced home compared with more than four in five households in the Borger, TX area.

Least Affordable Micropolitan Areas. In line with national trends, 9 of the 10 least affordable micropolitan areas are in the West (see exhibit 3). Many of these micropolitan areas are mostly vacation spots—the Jackson, WY-ID area, near the Grand Teton National Park; the Key West, FL area, on the Florida Keys; and the Edwards and Silverthorne, CO area, in Colorado ski country. High-cost micropolitan areas vary in remoteness from major metropolitan areas (varying from the Truckee-Grass Valley, CA area 40 miles outside Sacramento to the Jackson, WY-ID area 242.2 miles from Salt Lake City). The remote micropolitan areas also tend to be smaller; only three micropolitan areas exceed the average population size of all the 567 micropolitan areas. Although less populous, remote micropolitan areas are the least affordable of all the micropolitan areas and are booming. None of the least affordable micropolitan areas lost population; six of the least affordable micropolitan areas experienced double-digit growth from 1990 to 2000, and four grew more than 50 percent. In this top 10 list of least affordable micropolitan areas, the population growth could have a disproportionate influence on housing affordability by bidding up housing costs and making homes less affordable.

Exhibit 3

The Top 10 Least Affordable Micropolitan Areas*

Micropolitan Area	Population 2000	Change 1990–2000 (percent)	Region	Owner-Occupied Housing Units (percent)	Manufactured Housing Units (percent)	Households That Can Afford Housing (percent)	Median Home Value (US$)
Jackson, WY-ID	24,250	66.0	West	44.5	6.6	16.0	301,099
Silverthorne, CO	23,548	82.8	West	22.2	2.3	19.9	268,800
Edwards, CO	49,471	77.1	West	44.9	10.1	20.9	271,083
Key West, FL	79,589	2.0	South	42.4	19.0	32.8	195,700
Brookings, OR	21,137	9.4	West	61.0	26.1	35.9	125,000
Truckee-Grass Valley, CA	92,033	17.2	West	63.1	7.3	36.1	199,300
Heber, UT	15,215	50.8	West	58.3	4.2	37.3	186,800
Eureka-Arcata-Fortuna, CA	126,518	6.2	West	52.8	9.8	38.7	128,500
Taos, NM	29,979	29.7	West	55.0	21.3	39.0	124,900
Astoria, OR	35,630	7.0	West	47.9	8.3	39.3	138,800
U.S. average				60.2	7.6	58.5	111,800

** Micropolitan area names as designated in 2006.*

In other least-affordable micropolitan areas, two scenarios emerge. One scenario produces relatively modest home values, but taxes are high. Micropolitan areas in this category are the Brookings, OR area, the Eureka-Arcata-Fortuna, CA area, the Taos, NM area, and the Astoria, OR area. The other least affordable micropolitan area scenario produces hefty home prices, all close to double or triple the U.S. median, higher median taxes, and somewhat higher incomes than the United States as a whole. These micropolitan areas include the Jackson, WY-ID area, the Silverthorne, CO area, and the Edwards, CO area.

Only three of the least affordable micropolitan areas have manufactured housing percentages exceeding the micropolitan average, but this pattern does not seem to be connected to income. These 10 least affordable micropolitan areas have lower rates of homeownership or owner-occupied housing units—most likely related to the resort-driven nature of their economies. Vacation housing and desirability of location, which often come paired with environmental constraints, also drive up the price of housing costs.

Most Affordable Micropolitan Areas. Also similar to national housing cost trends, the most affordable micropolitan areas cluster in the South and Midwest, with eight in Texas alone (see exhibit 4). Except for the Mineral Wells, TX area and the Lamesa, TX area, the most affordable micropolitan areas are losing population, some with double-digit declines. All these places are smaller than the micropolitan area average and, except for one, are more remote than the typical micropolitan area. Many of these areas also are among the micropolitan areas that are the smallest and most quickly losing population (McGranahan and Beale, 2002); however, only 2 of the 10 most affordable micropolitan areas have a percentage of manufactured housing exceeding the micropolitan average; 4 are less than the U.S. average.

Exhibit 4

The Top 10 Most Affordable Micropolitan Areas*

Micropolitan Area	Population 2000	Change 1990–2000 (percent)	Region	Owner-Occupied Housing Units (percent)	Manufactured Housing Units (percent)	Households That Can Afford Housing (percent)	Median Home Value (US$)
Borger, TX	23,857	– 7.1	South	67.4	11.9	81.6	43,100
Andrews, TX	13,004	– 9.3	South	67.9	17.9	80.4	38,900
Pecos, TX	13,137	– 17.1	South	63.0	12.5	79.5	23,400
Parsons, KS	22,835	– 3.6	Midwest	65.3	6.3	79.2	44,300
Snyder, TX	16,361	– 12.2	South	59.8	8.9	77.9	45,000
Mineral Wells, TX	27,026	7.9	South	54.1	19.9	77.8	46,900
Pampa, TX	23,631	– 5.5	South	64.4	5.7	77.8	37,560
Vernon, TX	14,676	– 2.9	South	57.7	6.5	77.1	46,300
Coffeyville, KS	36,252	– 6.6	Midwest	62.0	7.8	77.1	47,500
Lamesa, TX	14,985	4.4	South	63.1	7.0	76.7	41,000
U.S. average				60.2	7.6	58.5	111,800

** Micropolitan area names as designated in 2006.*

The median house values in the most affordable micropolitan areas are well below the national average. For instance, several micropolitan areas are about one-half as much as the national average at the high end of the group in exhibit 4 and some micropolitan areas reach to one-third or less of the national average. Likewise, the taxes are one-fourth or one-third of the median value for micropolitan areas. The median household income in the most affordable micropolitan areas is moderate, although none of the areas equal the U.S. national average The data show that a combination of low housing costs and average income makes money go further in these micropolitan areas.

Micropolitan Areas With the Highest House Values. In 2000, median housing values in micropolitan areas ranged from a low of $23,400 in the Pecos, TX area to a high of $301,099 in the Jackson, WY-ID area. The West has 9 of the 10 micropolitan areas with the highest median housing values (see exhibit 5). Of the 9 micropolitan areas in the West, 5 appear on the top 10 list of the least affordable micropolitan areas (see exhibit 3).

The Los Alamos, NM area, home to a large U.S. Department of Defense weapons laboratory, ranked fourth in micropolitan area house values as of 2000, yet its housing was reasonably affordable. This relative affordability may be a result of the moderately high wages paid to government employees who dominate the area's workforce. Conversely, the resort-driven economies of the three micropolitan areas ahead of Los Alamos have more low-wage jobs and, thus, fewer people can afford its home prices. Much of the demand for housing in these micropolitan areas comes from outsiders seeking vacation property.

Exhibit 5

The Top 10 Micropolitan Areas With the Most Expensive Homes*

Micropolitan Area	Population 2000	Change 1990–2000 (percent)	Region	Owner-Occupied Housing Units (percent)	Manufactured Housing Units (percent)	Households That Can Afford Housing (percent)	Median Home Value (US$)
Jackson, WY-ID	24,250	66.0	West	44.5	6.6	16.0	301,099
Edwards, CO	49,471	77.1	West	44.9	10.1	20.9	271,083
Silverthorne, CO	23,548	82.8	West	22.2	2.3	19.9	268,800
Los Alamos, NM	18,343	1.3	West	74.3	5.5	64.0	213,000
Truckee-Grass Valley, CA	92,033	17.2	West	63.1	7.3	36.1	199,300
Key West, FL	79,589	2.0	South	42.4	19.0	32.8	195,700
Heber, UT	15,215	50.8	West	58.3	4.2	37.3	186,800
Durango, CO	43,941	36.1	West	57.1	16.6	44.9	174,500
Gardnerville Ranchos, NV	41,259	49.3	West	64.1	8.7	40.7	174,200
Oak Harbor, WA	71,558	18.9	West	60.1	10.9	50.7	168,400
U.S. average				60.2	7.6	58.5	111,800

** Micropolitan area names as designated in 2006.*

Micropolitan Areas With the Lowest House Values. All 10 micropolitan areas with the lowest median housing values are in the South (see exhibit 6); Texas alone has 9, and 4 of these low-house-value micropolitan areas also appear on the most affordable micropolitan areas list (see exhibit 4).

Exhibit 6

The Top 10 Micropolitan Areas With the Least Expensive Homes*

Micropolitan Area	Population 2000	Change 1990–2000 (percent)	Region	Owner-Occupied Housing Units (percent)	Manu-factured Housing Units (percent)	House-holds That Can Afford Housing (percent)	Median Home Value (US$)
Pecos, TX	13,137	– 17.1	South	63.0	12.5	79.5	23,400
Raymondville, TX	20,082	13.4	South	64.2	12.5	63.8	33,500
Sweetwater, TX	15,802	– 4.8	South	58.5	6.3	70.2	35,800
Rio Grande City-Roma, TX	53,597	32.3	South	65.1	10.2	54.3	35,900
Pampa, TX	23,631	– 5.5	South	64.4	5.7	77.8	37,560
Big Spring, TX	33,627	4.0	South	58.2	7.9	75.9	38,500
Andrews, TX	13,004	– 9.3	South	67.9	17.9	80.4	38,900
Alice, TX	39,326	4.4	South	66.9	16.5	72.7	40,400
Lamesa, TX	14,985	4.4	South	63.1	7.0	76.7	41,000
Middlesborough, KY	30,060	– 4.6	South	60.8	24.8	59.6	41,700
U.S. average				60.2	7.6	58.5	111,800

** Micropolitan area names as designated in 2006.*

The lowest value micropolitan areas are smaller places that lost population in the 1990s and lie very far from major metropolitan areas. These small, remote micropolitan areas have only average homeownership rates, a finding that suggests a mismatch between housing costs and income. The median income in all these micropolitan areas is below the micropolitan area median and only three-fourths of the U.S. average. Mortgage payments and taxes in these areas are approximately one-half of the micropolitan area median and one-third of the U.S. average. Median house values are one-third to one-half of the micropolitan area median and one-fifth to one-third of the U.S. average. Rio Grand City stands out from this group because of its growth rate—it lies along the Mexican border next to McAllen, Texas, and has seen a recent boom in immigration.

Policy Implications

This research has many possible implications, in part, because micropolitan areas are a new census category. Micropolitan areas differ in housing conditions somewhat from the nation as a whole. In some ways, micropolitan areas represent a housing success story because, in general, they have more affordable housing. Considering the relative affordability of these communities, policymakers should explore ways to strengthen the communities in areas such as economic development and housing preservation.

Certainly, micropolitan areas have major differences, many derived from regional location and degree of remoteness. Remote micropolitan areas may be affordable, but often they lack economic development. Micropolitan areas in the path of large urban sprawl may be developing rapidly; however, they also may need housing preservation programs.

The designation "micropolitan area" addresses a longstanding concern among rural advocates that many smaller—although important—cities fall below the Census Bureau's metropolitan area

category. These advocates lobbied the Census Bureau to find a means to capture such places, which resulted in the micropolitan label (Mahtesian, 2005). The micropolitan label also allows for a more sophisticated differentiation between what was rural (nonmetropolitan) and is now deep rural (noncore). The Census Bureau's previous nonmetropolitan designation was too broad to be synonymous with rural areas. The remaining noncore counties that fall below the micropolitan level can now be seen as truly rural.

The Census Bureau now officially recognizes a new category of statistical area, which could entitle what were formally nonmetropolitan places to apply for metropolitan-based federal and state housing aid. It may also mean that micropolitan areas need to forgo rural housing assistance. At this point, the jury is still out on the way micropolitan areas may go. The Census Bureau creates new categories based only on its read of human geography. The Census Bureau, however, makes no recommendations for how a new category such as micropolitan areas should relate to public policy issues such as federal aid. The leadership in micropolitan areas must determine the nature of the areas' needs and lobby state and federal agencies accordingly. For now, most micropolitan areas remain nonmetropolitan in self-identity, but that condition should change in the next several years as more of these areas come to understand the implications of their new designation.[11]

The Booming Western and Stagnating Southern Micropolitan Areas. The housing policy implications of the findings in this study range widely, depending on location. Apparently, large regional differences exist in housing opportunity, with the two extremes being resort communities of the West and remote rural parts of the South. Western micropolitan areas have affordability problems, while Southern micropolitan areas face potential abandonment issues. In both cases, housing opportunity is bound up with regional development trends. In some instances, housing could play a role in addressing larger issues such as maintaining sustainable environments and reinvigorating economic development.

The resort towns in the West have an acute housing affordability problem borne of a mostly low-wage economy and high home costs. Many of the houses in these micropolitan areas are for affluent second-home buyers, whose salaries are derived from professional and managerial jobs in big metropolitan areas. Most locals, who rely on a tourist economy, simply cannot compete in this housing market and sometimes need to commute from great distances to their jobs.

Although affordability may be primarily a housing problem, other competing interests weigh heavily on these areas. Much of the micropolitan West is picturesque and ecologically fragile. Most urban residents, including many from outside the region, want to see this land preserved and developed only as tourist destinations. Yet most locals prefer that these places be used for more than tourism, which would include extractive industries such as mining (Rengert and Lang, 2001). A booming mining or energy economy would have two effects. This type of economy generally pays higher wages than tourism and may also drive off vacation home development and big city homebuyers. Both of these effects could produce more affordable housing, but they also may result

[11] Very few micropolitan county officials even realized that the U.S. Census Bureau had recategorized the region they administered based on anecdotal reactions to Robert Lang's plenary address at the National Association of Counties legislative affairs meeting in March 2004.

in a less sustainable use of the land. Failing to address the housing affordability problem in western micropolitan areas could produce a conflict between locals and outsiders over the fate of these areas and change the direction of their economic development.

The problem in parts of the rural South, especially the Great Plains sections of Texas, is too little demand for housing. The housing there is affordable, resulting partly from the stagnating regional economy. Significant population loss occurred during the 1990s in areas such as Pecos, Borger, and Andrews, TX. These micropolitan areas have had an especially difficult time retaining recent high school and college graduates who seek opportunity elsewhere. Part of the efforts aimed at economic revitalization could be to profile housing opportunities.

Future research on micropolitan areas presents a challenge because of the Census Bureau's shift from the census long form to the American Community Survey (ACS). The absence of the long-form data will make it problematic to study the smallest micropolitan areas; however, the ACS should have enough cases to continue to track trends in larger micropolitan areas. The large micropolitan areas offer researchers an opportunity to study housing trends at the smallest urban level. Without the long form, it will be harder to cobble together data on less populous micropolitan areas; perhaps the ACS could conduct a special micropolitan analysis at least once each decade to fill this gap.

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Policy Briefs

The Policy Briefs department summarizes a change or trend in national policy that may have escaped the attention of researchers. The purpose is to stimulate the analysis of policy in the field while the policy is being implemented and thereafter.

Using American Community Survey Data in HUD's Income Limits and Fair Market Rents

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Abstract

The U.S. Department of Housing and Urban Development (HUD) is required to base its Income Limits and Fair Market Rents (FMRs) on the "most recent data available." The release of the 2005 American Community Survey (ACS) data posed several challenges for including these survey data in the estimation of these program parameters. This article discusses how HUD uses 2005 ACS data to establish Income Limits and FMRs. HUD encourages researchers to evaluate HUD's current use of the data and provide suggestions for incorporating the use of ACS data for smaller areas, when available, into these estimates.

Introduction

HUD is required by law to develop annually Income Limits for use in determining the eligibility of applicants for its assisted housing programs. Major active HUD-assisted housing programs that rely on Income Limits to determine eligibility are the Public Housing program, Section 8 Housing Assistance Payments program, Section 202 Supportive Housing for the Elderly, and Section 811 Supportive Housing for Persons with Disabilities. Many other federal and state housing, lending, or

other programs with income-based standards for participation incorporate, by statutory or regulatory reference, HUD's Median Family Incomes (MFIs)[1] and Income Limits.

Fair Market Rents (FMRs) are also required to be developed annually and published in final form, after providing an opportunity to comment, by October 1st of each year. These estimates are used primarily for HUD's Housing Choice Voucher Program, the Moderate Rehabilitation Single Room Occupancy Program, and the HOME rental assistance programs.

HUD calculates Income Limits and FMRs using the Office of Management and Budget's (OMB's) current geographic area definitions, with some exceptions. Currently, HUD develops these estimates annually for 2,575 geographic areas—530 metropolitan areas and 2,045 nonmetropolitan counties.

Description of the American Community Survey

Beginning with the 2010 Census, the long-form sample survey, heretofore the "gold standard" of socioeconomic survey data, will no longer be conducted. The Census Bureau developed the American Community Survey (ACS) to replace the decennial census long-form survey and to provide more timely information on the social, economic, and housing characteristics of the population in areas smaller than census regions, census divisions, or states. Starting in 2006, the Census Bureau implemented its plan to release ACS data annually for areas with a population of 65,000 or more. For areas with a population ranging between 20,000 and 65,000, the Census Bureau will release estimates based on 3 years of aggregated survey data, with the first such release in 2008. Updates of the 3-year estimates will be published annually in subsequent years. The same approach will be used for areas with a population of less than 20,000, but these releases will require aggregating data for 5 years to produce estimates. The first 5-year estimates for these areas will be released as early as 2010, and annual releases will follow. Partly because the data are more current and partly because decennial census long-form data no longer will be collected, HUD will rely increasingly on ACS data to produce its Income Limits and FMRs.

The ACS and the decennial census long-form survey use similar questions and similar data collection methods (that is, both are mailed surveys with extensive nonresponse followup). Despite these similarities, the ACS differs from the long-form survey in important respects that affect its use for HUD purposes. Among the most important differences are those (detailed below) concerning timeliness of data, measurement of variables, and the size and related statistical imprecision of the ACS.

- The ACS provides updated information throughout the decade because ACS data are collected continuously. In contrast, the long-form data were collected only once each decade, and that data became increasingly outdated as the decade progressed.
- The ACS is conducted on a continuous, rolling basis throughout the year; therefore, survey responses do not correspond to a particular date. The long-form responses are as of the census date, typically April 1; the lack of a fixed as-of date has implications for the as-of date assumed

[1] Most financial institutions and programs refer to the Area Median Income. This term is equivalent to HUD's Median Family Income.

for ACS-based calculations. The as-of date HUD has assigned for ACS 2005-based rents is June 30, 2005, the midpoint of 2005. The Census Bureau inflates income data to the annual average Consumer Price Index (CPI) for the ACS reference year. ACS MFI estimates thus correspond to "annual 2005" estimates, which HUD then updates to December by using the December CPI.

- The annual ACS has slightly more than one-tenth as many completed surveys as the decennial long-form survey, which surveyed approximately one out of every six households.
- The ACS reports data using different reporting periods for different-sized areas. For areas with a population of less than 65,000, the Census Bureau considers annual estimates to be below publication standards; therefore, it will release only 3-year moving average estimates for areas with a population ranging from 20,000 to 65,000 and 5-year moving averages for areas with a population below 20,000. The Census Bureau has addressed the relative imprecision of ACS estimates by publishing 90-percent confidence intervals around all ACS estimates. In contrast, long-form data releases do not include estimates of confidence intervals because normally they are small.
- The smaller ACS annual samples mean that ACS estimates have larger estimated margins of error (MoEs) than the comparable estimates from the long-form decennial census data. The ACS seeks to provide estimates that are close to the true population values for the variables measured. The likely accuracy of these estimates depends partly on sample sizes and partly on the distribution of values for a variable. The MoE, when added to and subtracted from the survey estimate, provides an indication of the range around a survey estimate, or the confidence interval, within which the true population value is likely to be found. For example, the 90-percent confidence interval for an estimate is the range around an estimate that provides a 90-percent likelihood of the true population value. ACS 1-year survey results, even for the largest areas, are inherently less reliable than 2000 Census results, as the following examples illustrate.
  - MoEs for 90-percent confidence intervals around 2000 Census median incomes for metropolitan areas as estimated by HUD range from 0.3 percent to 9 percent and average 1.5 percent.
  - In the 2000 Census, 91 percent of metropolitan area MFI estimates have MoEs of 2.5 percent or less.
  - MoEs around 2005 ACS MFI estimates for metropolitan areas with a population of 65,000 or more range from 0.7 percent to just under 20 percent and average 6.4 percent.
  - Less than 10 percent of 2005 ACS MFI estimates have MoEs of less than 2.5 percent.
- Estimates for areas smaller than census tracts (for example, block groups) will not be released in the official ACS tables. In contrast, long-form estimates provide block group data.
- The nature of several ACS-collected data items is altered. For example, the time period considered for the concept of income is changed significantly. The decennial census, taken in April, asked about income in the past calendar year, meaning that the 2000 Census actually provided annual 1999 income data. The ACS, for which data are collected throughout the year,

asks for income from the preceding 12 months, meaning that the 2005 ACS collects income information spanning 2 years, from January 2004 through December 2005. Incomes reported in ACS surveys are adjusted for inflation by the Census Bureau, using the CPI, to make them equivalent to annual incomes for the survey year.[2]

- Another change that affects both Income Limits and FMRs is the definition of *residency*. The ACS defines residency as "current residence." Use of this definition means a *housing unit* is a survey household's current residence if (1) the household that is currently living or staying in the unit is expected to stay more than 2 months, (2) the household in the unit is staying for less than 2 months but has no other place to live or stay, or (3) the household usually lives at the sample address but is away for a short period of time. In contrast, the long-form survey used a "usual residence" definition (that is, the place where a household lives and sleeps most of the year). This difference has a potentially significant effect on measured incomes and rents in areas where households typically reside in vacation or second homes for more than 2 months.

Estimating Income Limits Using ACS Data

MFI estimates serve as the basis for Income Limit calculations. The following definitions apply to HUD's Income Limit groups:

- Very low-income families—families whose incomes do not exceed 50 percent of the area MFI. This is the principal income limit definition, subject to adjustment as described in the following text, from which others are generally derived.
- Low-income families—families whose incomes do not exceed 80 percent of the area MFI.
- Extremely low-income families—families whose incomes do not exceed 30 percent of the area MFI.

Exceptions to these arithmetic relationships between MFIs and Income Limits occur when family incomes or housing-cost-to-income relationships are unusually high or low. HUD updates the MFI by using ACS income data and then calculates Income Limits based on the MFI.

HUD calculates MFIs by FMR area, using the Census Bureau definition of "family"[3] as the first step in the process of establishing Income Limits. The 2000 Census provides base income estimates for 1999.

The 2005 ACS data became available in late 2006 and were incorporated into HUD's fiscal year (FY) 2007 MFI estimates and Income Limits, released on March 20, 2007. HUD sought to make as much use of the 2005 ACS data as was statistically justified. The base income was still set at 1999 from the 2000 Census and the 2005 ACS data were used to update the 1999 income to 2005. MFI estimates have significantly larger MoEs than decennial census estimates of MFIs and often

[2] *Income, Earnings, and Poverty Data From the 2005 American Community Survey,* page 2, accessed at census.gov/prod/2006pubs/acs-02.pdf.

[3] The Census Bureau definition of *family* is a householder with one or more other people living in the same household who are related to the householder by birth, marriage, or adoption. The definition of family excludes one-person households and multiperson households of unrelated individuals.

produce lower estimates compared with forward-trended 2000 census data; therefore, HUD has implemented ACS results with some caution.

The following major steps outline the calculation of FY 2007 MFIs and Income Limits:

- Aggregate 2000 Census income distributions by FMR area and estimate 1999 MFIs based on these data.[4]
- For update factors, take 1999 MFI estimates to December 2005:
  - *For areas with a population of 65,000 or more*, a weighted average of (a) the change in local area MFI from 1999 (2000 Census) to 2005 (local 2005 ACS) and (b) the change in state MFI from 1999 (state 2000 Census estimates) to 2005 (state 2005 ACS estimates) is calculated. The weight assigned to the change in state MFI (b) is five times the local "margin of error ratio" (MoER), or one, whichever is smaller. The MoER is defined as the margin of error for the 90-percent confidence interval of the 2005 ACS local estimate divided by the 2005 ACS estimate of local MFI. The weight assigned to the change in local median family income from the ACS (a) is the larger of 1 minus 5 times the MoER or zero.[5]
  - *For areas with a population of less than 65,000,* Income Limits are developed in several steps. First, census and ACS survey data are used to develop national- and state-level estimates of change in MFIs. Then, the Bureau of Labor Statistics' (BLS's) local area wage data are used to develop an indicator of relative income change within states; but they are adjusted so that when summed to the state level they produce the same change as the ACS. Based on research on the relationship between state median income growth, local average wage growth, and local median income growth between the 1990 and 2000 Censuses, local 2000 Census-based MFI estimates are updated by HUD using a combination of ACS state median income and local BLS average wage data until more localized ACS data begin to be available.
- Because of delays in the availability of BLS and ACS data, estimates are trended to produce a current estimate. All estimates are trended from December 2005 to April 2007 (1.25 years) with a trending factor of 3.5 percent per year, which is based on the average change in MFIs between the past two decennial censuses.
- For the outlying territories,[6] which currently lack BLS or ACS coverage, the 1999 income data from the 2000 Census are updated to 2005 using the national ACS income change.

[4] Underlying 2000 Census income distribution tables have not changed from fiscal year 2006. They are posted at www.huduser.org.

[5] Because the largest margin of error rate (MoER) in the fiscal year (FY) 2005 American Community Survey (ACS) local data is approximately 0.2, the factor of 5 ensures that the local ACS estimates with the largest MoERs exert almost no influence on the FY 2007 Median Family Income (MFI) estimates. In cases in which HUD's special tabulations of MFIs have MoERs larger than in Census-published areas, HUD effectively excludes their use by capping the value of 5 times MoER at 1.

[6] The areas without ACS coverage are American Samoa, Guam, the Northern Mariana Islands, and the U.S. Virgin Islands. Puerto Rico is covered by the ACS-equivalent Puerto Rico Community Survey.

Estimating Fair Market Rents Using ACS Data

Fair Market Rents are based on a gross-rent concept. Gross rent includes the costs of all major utilities, whether they are included in *contract* rent or paid directly by the family. All utility costs are included except telephone, cable or satellite television, and Internet services. HUD seeks to set FMRs at levels that will ensure availability of a sufficient supply of rental housing to program participants. To accomplish this objective, HUD must set FMRs both high enough to permit a selection of units and neighborhoods and low enough to serve as many low-income families as possible.

The level at which HUD sets FMRs is expressed as a percentile point within the rent distribution of standard-quality, recent-mover, rental housing units.[7] HUD currently uses the 40th percentile rent, the dollar amount below which 40 percent of standard-quality, recent-mover, rental-housing units are rented.[8] In its computation, HUD is required to exclude nonmarket rental housing; therefore, HUD excludes all units that fall below a specified rent level derived from HUD public housing rent data as likely to be either assisted housing or some other form of nonmarket rent.

HUD incorporated the 2005 ACS data into the FMR calculations for the FY 2008 proposed FMRs, published July 12, 2007. Some of the same concepts that HUD developed during the production of Income Limits were also used for the publication of FMRs. HUD also took into account the significantly smaller sample available for generating FMRs. Because FMR estimates are based on only rents for two-bedroom, standard-quality, recent-mover, market-rate rental units, sample sizes are often small. To explicitly consider this factor in the calculations, HUD uses information from both the survey MoE and the sample size to determine when and to what extent local ACS data should be used in FMR rent calculations. The Census Bureau requires 3 unweighted sample cases or 50 weighted sample cases for publication of any cell in HUD special tabulations; however, HUD believes these requirements are too liberal. For example, a single area could have five sample cases with very similar rent values. The MoE for this survey result would be very small, but HUD would still reject these data as possibly nonrepresentative.

HUD used data from the 2005 ACS survey largely to replace the accumulated 2001-through-2005 FMR update factors from various sources HUD used to estimate FY 2007 FMRs. HUD continues to use random digit dialing (RDD) telephone surveys performed between 2001 and 2005 in FMR calculations in limited circumstances.[9] When both the FMR standard-quality, recent-mover, market-rate rental units, sample size is 200 or more and the MoE is small, HUD has rebenchmarked FMR areas using the annual ACS rent estimates; these FMR areas have been rebenchmarked to 2005

[7] Standard-quality rental housing units have the following attributes as derived from possible responses on the American Community Survey (ACS) questionnaire: "Occupied rental units paying cash rent," "Specified renter on 10 acres or less," "With full plumbing," "With full kitchen," "Unit built before 2005," and "Meals not included in rent." For the 2005 ACS, recent movers have moved into the unit in 2004 or 2005.

[8] Most Fair Market Rent (FMR) areas are based on a 40th-percentile rent. Certain areas, however, are assigned 50th-percentile FMRs, which were established by a rule published on October 2, 2000, that also established the eligibility criteria used to select areas that would be assigned 50th-percentile rather than the normal 40th-percentile FMRs. (See 24 CFR 888.113.)

[9] Random digit dialing telephone surveys rely on computer-assisted technology to randomly select the phone number that will be called. These surveys collect recent mover rents by metropolitan area.

for the FY 2008 proposed FMRs. For the FY 2009 FMRs, HUD may rebenchmark these and some additional FMR areas to 2006 using ACS data.

To produce FY 2008 proposed FMRs, HUD first calculates 2005-equivalent rents for all FMR areas using update factors, then evaluates valid local area ACS results against these 2005-equivalent rents, and then updates and trends these rents to April 2008, the midpoint of FY 2008, using standard FMR update procedures. HUD calculates update factors using decennial census data and 2005 ACS data. All update factors reflect the change in standard-quality, two-bedroom median rents between the 2000 decennial census and the 2005 ACS at the smallest level of geography for which at least 200 survey cases are available in the 2005 ACS data. HUD uses four different levels of aggregation to measure rent changes from 2000 to 2005. These levels of aggregation can be separated into two geographic categories: the first category is state based, and the second category is metropolitan-area based.

Of the two varieties of state-based updated factors, the first, and most basic, factor measures the change in median rents using all observations available for a given state. The second state-based update factor is calculated from a subset of state observations. HUD derives the subset by removing the observations in metropolitan areas with valid ACS surveys (that is, ACS surveys with 200 or more standard-quality, two-bedroom observations). HUD uses this update factor to measure the change in median rents without the effect of rent changes in the portion of the state already covered by ACS metropolitan surveys.

HUD also generates update factors for two types of metropolitan area definitions, Core Based Statistical Areas (CBSAs) and FMR areas. CBSAs are unmodified OMB-defined metropolitan areas. FMR areas are either OMB-defined metropolitan areas or HUD-defined subareas of CBSAs, as defined in the proposed FY 2006 and proposed FY 2007 FMR preambles.

To generate the 2005 FMR base calculation (which is not the same as the published FY 2005 two-bedroom FMR), HUD uses the update factor, which varies by the level of geography used. With one exception, the update factor HUD uses is the update factor for the smallest geographic area that also contains 200 or more survey observations. Subareas for FMR areas without valid local surveys receive either the CBSA- or state-level update factor, based on which factor moves its estimate closer to the CBSA rent value. The actual decision process, which is somewhat involved, is described in detail in the online FMR documentation systems referenced at the end of this article.

After HUD generates the 2005 FMR base calculation using the decennial census-based rent and the relevant ACS-based update factor, it evaluates local area recent-mover ACS results. ACS recent-mover rent estimates are used only to provide a new 2005 FMR base calculation when the FMR area has more than 200 recent-mover cases and when the rent result from these recent-mover cases is *statistically* different from the 2005 FMR base calculation.

HUD used local area and regional CPI inflation factors to take the rent estimates from June 2005 to December 2006 and used the standard HUD annual trending of 3 percent for 1.25 years to project the FMR estimate from the end of 2006 to April 2008.

Benefits and Challenges of Incorporating 2005 ACS Data in Income Limit Calculations

HUD has no choice but to use the ACS data. It is all that will be available from now on, and it represents the most current data available. HUD is using the 1-year data with caution because of the greater MoEs, but the state ACS data derived from the fully implemented 2005 ACS have a much greater degree of reliability than previous (2000-to-2004) test-ACS state MFI estimates. In the FY 2007 HUD MFI estimates, HUD is using direct comparisons between the state estimates from the 2000 Census and the 2005 ACS to calculate state-level changes, rather than using a combination of CPS-to-CPS (the Census Bureau's Current Population Survey) and ACS-to-ACS changes and applying them to 2000 Census estimates.

Eventually, when the 5-year aggregated data become available, HUD will be able to eliminate the use of BLS data. The BLS data are measuring wages, which, although an important component, is not the same as measuring family income, so the elimination of this updating measure will improve the income estimates.

The new procedure has the effect of producing a number of downward adjustments to state median family income estimates due to inherent differences between forward-trended 2000 Census estimates and the ACS estimates. One source of this difference may be that the flow nature of the income reference period for ACS respondents results in the failure to capture real income growth experienced by sampled families after they were surveyed. That is, if all families surveyed by the 2005 ACS were asked in December 2005 about their income during the previous 12 months rather than throughout the course of the year, the resulting MFI estimate would be higher to the extent families had experienced real income growth during 2005. HUD anticipates that as local ACS MFI estimates become available for smaller areas, they will also reflect the negative differential between 2000 Census and ACS MFI estimates, which is why HUD implemented this change in estimation methodology with the first use of the full ACS. HUD mitigates declines in its MFI estimates by using a "hold harmless policy" for Income Limits.

In implementing 2005 ACS data, HUD faced two primary challenges. First, only estimates for areas with a population of 65,000 or more are available. Second, even when estimates of local median income are available, the smaller sample sizes of the ACS relative to the decennial census mean that ACS survey estimates are not as reliable. Decennial census estimates were also subject to sampling error, but the ACS develops estimates from annual samples using fewer surveys, which are more likely to vary due to sampling error.

HUD's objective was to minimize the possibility of publishing income estimates in which the annual change is more a reflection of the variation in estimation errors than a reflection of changes in underlying economic conditions. To meet this objective, HUD developed a formula for incorporating 2005 ACS local median income estimates into its FY 2007 MFI estimates that explicitly considers the MoEs in the local ACS results. The formula HUD developed gives lower weight to the potentially less accurate ACS estimates with large MoEs, thus limiting the influence of local ACS estimates in these areas on the HUD MFI estimates. Conversely, the formula gives heavier weight to ACS local median income estimates with small MoEs, enabling the ACS estimate to be the dominant component of HUD estimates in these areas.

Benefits and Challenges of Incorporating 2005 ACS Data in Fair Market Rent Calculations

The decennial census served as the benchmark for FMRs. To eliminate trending of up to 14 years, HUD developed a survey methodology—RDD telephone surveys—that would rebenchmark areas between census periods. Based on telephone interviewing, the RDD survey has become much more costly and difficult to conduct over time, and, because the ACS provides better sample data, the use of the ACS data provides a benefit to HUD in reducing the need for RDD surveys in most large metropolitan areas.

A challenge in using ACS data in the production of FMRs is inherent in the definition of FMR. HUD calculates FMRs for standard-quality, two-bedroom, recent-mover, market-rate, rental units. This definition of FMR means that HUD must eliminate large portions of the survey sample to provide a rental unit distribution that can generate FMRs using the following process:

- Remove approximately 65 percent of housing units because they are owned, not rented.
- From the 35 percent remaining renter housing sample, remove 60 percent of rental units because they are not two-bedroom units.
- Eliminate an additional 5 percent of the sample because those units do not meet standard-quality and market-rate housing requirements.

In total, HUD can use only about 10 percent of the ACS sample in the calculation of FMRs.

Although the use of 3-year and 5-year data will improve sample sizes for the calculation of FMRs, the term "recent mover" will have no meaningful definition. Traditionally, FMRs have been based on recent-mover rents, a consideration that rents for new tenants often are higher than those for long-term residents. In the long-form decennial census data, the term "recent mover" generally was defined as a renter who moved into a unit within the past 15 months; however, this type of renter cannot be captured consistently in ACS data. For example, in an area where estimates are based on 5-year data (2005 through 2009 and released in 2010), a tenant who moved in during February 2004 and was surveyed in January 2005 would count as a recent mover, but a tenant who moved in during November 2007 and would be surveyed in December 2009 would not be classified as a recent mover.

The small ACS sample size means that few large areas have enough recent-mover rent responses to be considered probable as fully representative. HUD's ability to obtain and use recent-mover rents from the ACS as the basis of its FMRs will most likely require the development of recent-mover bonuses based on larger area data.

Conclusion

HUD cannot ignore the income and rent data available from the ACS, and it must continue to find ways to incorporate these data for smaller areas. HUD's measured approach to incorporating 1-year data reflects the stability of the fully implemented ACS. Although changes for FY 2007 Income Limits and FY 2008 FMRs reflect some significant changes resulting from differences in the

2000 Census and 2005 ACS data, significant differences are not expected to continue in the next year's publication. In its examination of 2006 ACS income data for the FY 2008 publication, HUD sees no significant fluctuations. HUD also expects FMRs to be fairly stable.

HUD will require additional research to provide answers on how best to proceed with the 3-year and 5-year data. For example, will HUD effectively rebenchmark Income Limits and FMRs annually after these data become available? For Income Limits, even with the hold harmless policy, does effective annual rebenchmarking of MFIs mean there will be greater annual fluctuations? For FMRs, would problems continue in measuring small areas with tight markets? Annual ACS data would enable HUD to adjust bedroom intervals (the difference in gross rents by number of bedrooms) for FMRs; however, would this annual adjustment cause too much variation in FMRs? Last, as previously mentioned, the big issue for FMRs is how to continue to use the concept of recent mover.

Researchers wishing to use MFIs, Income Limits, and/or FMRs should be fully cognizant of the origins of these series and the fact that computational methodology changes over time. Although HUD strives to maintain statistical rigor and accuracy in these series, they were designed to be program operating parameters and not a purely statistical release like Census data. Researchers are advised to limit their use of MFIs, Income Limits, and FMRs to studies of the HUD programs for which they were designed unless, after careful consideration of the estimation methodology, investigators are satisfied that the series can contribute to their research objectives.

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Additional Reading

Researchers may further investigate Income Limits and Fair Market Rents (FMRs) by accessing useful information at the following websites:

- Interactive documentation system that explains the calculation of both 2007 Median Family Income (MFI) estimates and 2007 Income Limits: http://www.huduser.org/datasets/il/il2007_docsys.html. The direct link to the MFI-only system: http://www.huduser.org/datasets/il/index_mfi.html.

- Interactive documentation system that explains the calculation of FMRs from 2005 through 2008: http://www.huduser.org/datasets/fmr.html.
- Information about HUD's use of the American Community Survey in its calculation of FMRs for fiscal year (FY) 2008 is accessible directly through the FY 2008 documentation system: http://www.huduser.org/datasets/fmr/fmrs/index.asp?data=fmr08.
- Extensive discussion of the development of current HUD FMR areas: http://www.huduser.org/datasets/fmr/fmr2006P/Preamble_FY06_FMRP.pdf. Discussion of further modifications: http://www.huduser.org/datasets/fmr/fmr2007P/FY2007P_Preamble.pdf.

Data Shop

Data Shop, a department of Cityscape, presents short papers or notes on the uses of data in housing and urban research. Through this department, PD&R introduces readers to new and overlooked data sources and to improved techniques in using well-known data. The emphasis is on sources and methods that analysts can use in their own work. Researchers often run into knotty data problems involving data interpretation or manipulation that must be solved before a project can proceed, but they seldom get to focus in detail on the solutions to such problems. If you have an idea for an applied, data-centric note of no more than 3,000 words, please send a one-paragraph abstract to David.A.Vandenbroucke@hud.gov for consideration.

HUD-Assisted Housing 101: Using "A Picture of Subsidized Households: 2000"

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Abstract

"A Picture of Subsidized Households" is a series of reports showing aggregated data for various U.S. Department of Housing and Urban Development programs and at different geographic levels. This article demonstrates one of the uses of these data for research, including data limitations.

Introduction

One objective of the Office of Policy Development and Research (PD&R) at the U.S. Department of Housing and Urban Development (HUD) is to provide access to HUD program data to researchers and policy analysts. This provision is accomplished in a way that supports research and, hence, policy formulation, without revealing information about individual people. As part of this effort, PD&R has compiled a series of comprehensive information on subsidized households from HUD's major data collection systems. In the 1990s, this compilation resulted in printed publications

called "A Picture of Subsidized Households" (Picture). Previous publications include Picture as of the 1970s, 1996, 1997, and 1998. Paul Burke (a former staff member in PD&R) conceptualized and created these data summaries. The current Picture 2000 uses the same concepts and general layout for presentation as the original summaries. A few items have been revised or deleted and some new items were added. Although all the reports are available for downloading from the web, "A Picture of Subsidized Households: 2000" (Picture 2000) is the first one with a web-based query and download tool.[1] The updates and improvements to this data system are the responsibility of the Program Monitoring and Research Division within PD&R.

In this article, we first describe the scope of the data and then provide illustrative examples of how researchers might use the database and discuss some limitations of its use.

Scope of the Data

The goal of Picture is to provide basic information for a researcher (or anyone interested in housing policy) to be able to sketch the characteristics of participants in the HUD-subsidized housing program, know some information about the public housing agencies (PHAs) or contracts/projects, and gain knowledge about the neighborhoods where the participants lives.

The report (and accompanying database) includes household data, aggregated by program at various geographic levels. The programs are Public Housing, Housing Choice Voucher Program (HCVP, formerly called Section 8 Certificates or Vouchers), Moderate Rehabilitation (Mod Rehab), Project-based Section 8—New Construction and Substantial Rehabilitation, Section 236, Below Market Interest Rate, Section 202 Supportive Housing for the Elderly, and Section 811 Supportive Housing for Persons with Disabilities. The geographic levels are national, metropolitan statistical area (MSA), state, city, census tract, and PHA.[2] Summaries at the MSA and city levels are new in 2000 and will be available in future issues of Picture.

The data included in Picture are primarily characteristics of the participants in HUD's rental subsidy program. These characteristics include social and economic categories such age, race, rent, and income; household type, such as elderly, disabled, and families with children; and certain characteristics of the housing unit and, where appropriate, neighborhood. In general, the summary characteristics are provided as a percent and averages with the denominator as the number of reported households. In addition to providing the tenant data, the report also includes some limited data related to projects or PHAs, such as total units, percent occupied, number reported, percent reported, and spending. Project-level summaries are available for Multifamily Assisted Housing Programs and Public Housing. The geographic summaries are provided at the national, state, county, and census tract levels. In addition to including geographic location, the report provides some neighborhood characteristics, such as poverty, minority, and single-family home ownership.

[1] See www.huduser.org/picture2000/index.html for a more complete description of the data elements in Picture 2000.

[2] Individual households in the Housing Choice Voucher Program and Moderate Rehabilitation program provide addresses as part of their report to HUD. Addresses for Public Housing and Multifamily Assisted Housing Programs were derived from project addresses. These addresses are geocoded to determine the metropolitan statistical area, city, county, and census tract location of the household.

These neighborhood characteristics are obtained directly from Census 2000 (SF3) at the census tract level. A weighted version of these characteristics is calculated for other geography levels.[3] Data in Picture 2000 represent households reported in the 18-month period ending December 31, 2000.

Uses and Limitations of the Data

Picture provides easy access to information about the size of HUD's assisted programs and about the participants. Although Picture does not make all information about tenants available, it provides key factors for policy analysis, according to what PD&R believes to be key factors. The underlying data come from HUD's administrative data systems, which are designed to capture information about all assisted tenants. In HUD's database system, each household that receives a subsidy is required to report at least annually. In fact, only about 92 percent of active households had information reported as of December 2000.

Beginning with Picture 2000, users can obtain the data through a web-based query tool. This access enables researchers to select the programs, demographic characteristics, and summary levels of interest. The results of the query can be viewed as a web-based report or viewed and saved as a comma-delimited file available for downloading and further statistical analysis.[4] In addition, the entire database (at several summary levels) and the data documentation can be downloaded from the website.

The following examples illustrate the kinds of results available from Picture 2000. This article focuses on two tenant characteristics—age (elderly or not) and income—and one neighborhood characteristic—poverty rate. These examples are not meant to analyze fully the data in Picture; they merely illustrate the kinds of questions that Picture data easily answer. We hope these examples stimulate interest in the dataset as a tool for policy analysis.

At the national level, as of December 2000, of the 4.88 million HUD-subsidized units available, 87 percent are occupied. Exhibit 1 shows some of the characteristics to be found in the data. For example, one tenant characteristic is being classified as elderly (62 years or older). Nationwide, 31 percent of HUD-assisted housing programs consist of elderly households; however, more than 80 percent of Mod Rehab and HCVP consist of nonelderly households. Elderly households represent 59 percent of Section 8 New Construction/Substantial Rehabilitation and 36 percent of the category All other multifamily assisted. The category New Construction/Substantial Rehabilitation includes the program assisted through Section 202/8, and the All other multifamily assisted category includes households assisted through the program Section 202/PRAC.

[3] The weights are the number of occupied units for Multifamily Assisted Housing and Public Housing and for the Housing Choice Voucher Program (HCVP) at the public housing agency and state levels. The weight for the HCVP at the city and metropolitan statistical area levels is the number of reported households.

[4] Instructions for downloading and using the comma-delimited file are provided as a link on the Picture 2000 web page: www.huduser.org/picture2000/index.html.

Exhibit 1

A Picture of Subsidized Households: 2000, National Summary Data

Program	Number of Subsidized Units Available*	Percent Occupied	Number Reported	Percent Reported	Percent Elderly (62 or Older)	Spending per Month** ($)	Income Categories (percent)					Percent Extremely Low Income
							Less Than $5,000	$5,000 to $9,999	$10,000 to $14,999	$15,000 to $19,999	$20,000 or More	
U.S. total, all HUD programs	4,881,081	87	3,903,506	92	31	421	17	45	21	10	7	70
Public Housing	1,282,099	89	1,056,174	93	32	426	21	45	18	8	8	69
Housing Choice Voucher Program	1,817,360	82	1,497,040	100	17	427	16	43	21	11	9	73
Moderate Rehabilitation	111,392	65	57,367	79	16	449	32	44	13	6	4	82
New Construction/ Substantial Rehabilitation	877,830	84	724,129	98	59	497	11	52	25	9	4	69
Section 236	440,329	96	276,799	66	35	263	16	39	23	13	9	63
All other multifamily assisted	352,337	98	291,997	85	36	324	20	43	20	9	8	70

** Number of units under contract for federal subsidy and available for occupancy.*

*** Average spending per unit per month.*

Picture also enables researchers to easily determine other important tenant characteristics. For example, exhibit 1 shows that 70 percent of the households reported in all HUD-subsidized programs are extremely low-income households. At least 55 percent of these households have an annual household income of less than $10,000.

The smallest geography that Picture provides is the census tract summary. At this geography level, the number of units available and occupied are coded as "not applicable." The unit-based programs such as Multifamily Assisted Housing and Public Housing can provide unit information at the census tract level.[5]

Before presenting some examples of analysis at the census tract level, we need to note a few data limitations. First, if the number of tenants reported for a particular program in a single tract is less than 11 households, all the household characteristics are suppressed (coded as "–4"). This action is taken to protect the identities of HUD's clients when information is released to the public.

Second, some of our data records do not provide sufficient address information to determine the census tract with complete confidence. The geocoding process results in a small percentage of records without a specific census tract. For those records, we provide state and county but no census tract information. At the census tract summary level, the Picture 2000 database has more than 69,000 records while 66,304 census tracts are in the nation. The extra records represent those summaries of households with no identifiable census tract. These records are included to maintain the overall total for each program.

The census tract summaries lend themselves to illuminating analyses. The following examples illustrate working with these census tract summaries. These types of analyses were done by Devine et al. (2002).

Most important, the census tract data in Picture enables analysts to map the location of assisted housing in their community.[6] Maps often present a clearer message about the programs than can be derived from tabular data. One such example is shown in exhibit 2. The map, developed by Seth Marcus in the Program Monitoring and Research Division, shows the location of various forms of assisted housing in Baltimore, Maryland. In this case, the census tract summaries of HCVP tenants are shown in relation to the locations for public housing and project-based assistance projects. The presence of several clusters of housing assistance is readily apparent in the map.

In addition to being mappable, census tract summary data can also provide useful tabular analyses. Using the census tract summaries for all HUD programs combined, it is possible to analyze, for example, the distribution of assisted households by location and by neighborhood poverty concentration. Exhibit 3 shows that about one-third of HCVP households in metropolitan areas reside in neighborhoods with 10- to 19-percent poverty, while 48 percent of HCVP households live

[5] The Housing Choice Voucher Program (HCVP) and Moderate Rehabilitation (Mod Rehab) do not lend themselves to calculating units available and occupied at the census tract level. For HCVP and Mod Rehab, the lowest level of geography for these variables is the public housing agency.

[6] The Picture 2000 website, www.huduser.org/picture2000/index.html, contains additional details about downloading and using the geographic information in Picture 2000.

Exhibit 2

Poverty Rate and Location of Subsidized Housing in Baltimore, Maryland

in similar poverty neighborhoods in nonmetropolitan areas. In the metropolitan suburban areas, about 40 percent live in neighborhoods with less than 10-percent poverty. In central cities, higher proportions of households live in areas of high poverty compared with households in the suburbs and nonmetropolitan areas.

Exhibit 4 presents the distribution of households headed by elderly tenants in the HCVP. The number of households headed by elderly tenants was calculated based on the percent and number of reported households. Those census tracts with fewer than 11 reported households were considered zero elderly households. About 2 percent of households headed by elderly tenants were lost using this process. For the HCVP, the proportion of households headed by elderly tenants and living in

Exhibit 3

Distribution of HCVP Households by Location and Neighborhood Poverty Rate, Picture 2000

Poverty Rate	Total		Metropolitan						Non-metropolitan	
			Total Metropolitan		Central City		Suburb			
	Number	%	Number	%	Number	%	Number	%	Number	%
All tracts	1,397,717	100	1,189,650	100	725,722	100	463,967	100	208,028	100
0-9%	301,449	21.6	264,885	22.3	80,380	11.1	184,534	39.8	36,535	17.6
10-19%	489,217	35	389,309	32.7	212,901	29.3	176,418	38	99,898	48
20-29%	325,749	23.3	278,399	23.4	209,912	28.9	68,487	14.8	47,350	22.8
30-39%	177,809	12.7	160,353	13.5	135,315	18.6	25,038	5.4	17,456	8.4
40% or more	103,493	7.4	96,704	8.1	87,214	12	9,490	2	6,789	3.3

HCVP = Housing Choice Voucher Program.

Exhibit 4

Distribution of HCVP Households Headed by Elderly Tenants by Location and Neighborhood Poverty Rate, Picture 2000

Poverty Rate	Total Elderly		Central City		Suburb		Nonmetropolitan	
	Number	%	Number	%	Number	%	Number	%
All tracts	216,859	100	108,291	100	77,803	100	30,765	100
0-9%	50,042	23.1	12,937	11.9	31,649	40.7	5,456	17.7
10-19%	81,438	37.6	34,313	31.7	31,078	39.9	16,047	52.2
20-29%	47,917	22.1	30,440	28.1	11,159	14.3	6,319	20.5
30-39%	23,903	11	18,753	17.3	2,884	3.7	2,266	7.4
40% or more	13,558	6.3	11,847	10.9	1,033	1.3	678	2.2

HCVP = Housing Choice Voucher Program.

high-poverty areas of central cities is at least double the proportion of those who live in nonmetropolitan areas and suburbs of similar poverty concentration. Only 17 percent of HCVP households in the Section 8 program are headed by elderly tenants.

Exhibit 5 provides the neighborhood poverty rate distribution for nonelderly HCVP tenants. The results are quite similar, with a slightly greater percentage of households headed by nonelderly tenants living in the highest poverty census tracts.

The data for HCVP reported households provided at the census tract level can be aggregated to MSA, city, state, and national levels but not to the PHA level. Picture does not provide the PHA code with the HCVP census tract summary because a few tracts with tenants are from more than one PHA. For Public Housing, project-level summaries are provided, enabling researchers to aggregate information to the PHA level.

A similar analysis can be done for all HUD programs combined because this summary is available at the census tract level. Exhibits 6, 7, and 8 present the same analysis as in the previous tables

Exhibit 5

Distribution of HCVP Households Headed by Nonelderly Tenants by Location and Neighborhood Poverty Rate, Picture 2000

Poverty Rate	Total Nonelderly		Central City		Suburb		Nonmetropolitan	
	Number	%	Number	%	Number	%	Number	%
All tracts	1,184,929	100	618,598	100	388,128	100	178,204	100
0-9%	253,759	21.4	67,975	11	154,362	39.8	31,422	17.6
10-19%	408,925	34.5	178,907	28.9	145,720	37.5	84,299	47.3
20-29%	278,145	23.5	179,606	29	57,396	14.8	41,142	23.1
30-39%	154,032	13	116,644	18.9	22,175	5.7	15,214	8.5
40% or more	90,068	7.6	75,466	12.2	8,475	2.2	6,127	3.4

HCVP = Housing Choice Voucher Program.

Exhibit 6

Distribution of All HUD-Assisted Households by Location and Neighborhood Poverty Rate, Picture 2000

Poverty Rate	Total		Metropolitan						Non-metropolitan	
			Total Metropolitan		Central City		Suburb			
	Number	%	Number	%	Number	%	Number	%	Number	%
All tracts	3,693,445	100	3,081,981	100	2,037,708	100	1,044,316	100	611,464	100
0-9%	691,259	18.7	595,010	19.3	188,357	9.2	406,686	38.9	96,249	15.7
10-19%	1,128,900	30.6	848,092	27.5	467,583	22.9	380,519	36.4	280,808	45.9
20-29%	812,047	22	664,593	21.6	512,076	25.1	152,517	14.6	147,454	24.1
30-39%	528,378	14.3	471,493	15.3	405,297	19.9	66,196	6.3	56,885	9.3
40% or more	532,861	14.4	502,793	16.3	464,395	22.8	38,398	3.7	30,068	4.9

Exhibit 7

Distribution of All HUD-Assisted Households Headed by Elderly Tenants by Location and Neighborhood Poverty Rate, Picture 2000

Poverty Rate	Total		Central City		Suburb		Nonmetropolitan	
	Number	%	Number	%	Number	%	Number	%
All tracts	1,154,164	100	598,611	100	363,653	100	191,900	100
0-9%	275,018	23.8	66,694	11.1	169,564	46.6	38,760	20.2
10-19%	369,713	32	148,773	24.9	127,875	35.2	93,065	48.5
20-29%	236,770	20.5	153,619	25.7	43,465	12	39,686	20.7
30-39%	141,655	12.3	113,155	18.9	14,706	4	13,794	7.2
40% or more	131,008	11.4	116,371	19.4	8,043	2.2	6,594	3.4

Exhibit 8

Distribution of All HUD-Assisted Households Headed by Nonelderly Tenants by Location and Neighborhood Poverty Rate, Picture 2000

Poverty Rate	Total		Central City		Suburb		Nonmetropolitan	
	Number	%	Number	%	Number	%	Number	%
All tracts	2,542,477	100	1,439,980	100	682,302	100	420,195	100
0-9%	418,250	16.5	122,117	8.5	238,404	34.9	57,730	13.7
10-19%	760,024	29.9	319,048	22.2	252,931	37.1	188,044	44.8
20-29%	575,484	22.6	358,551	24.9	109,099	16	107,833	25.7
30-39%	386,794	15.2	292,190	20.3	51,501	7.5	43,104	10.3
40% or more	401,925	15.8	348,074	24.2	30,367	4.5	23,483	5.6

but for tenants in all HUD-assisted programs. These exhibits show that the overall poverty rates tend to be slightly higher for all programs combined than for the HCVP alone. This article is not intended to explain why this would be the case but simply to illustrate how a researcher might use Picture to gather basic information about the tenants. Further analysis of which particular program participants are more likely to live in high-poverty tracts is left to the reader.

Conclusion

Picture 2000 provides researchers and policy analysts with ready access to information about the size of assisted housing programs and the characteristics of tenants at a variety of levels. This article is intended to stimulate interest in using this tool for research and policy analysis. We have shown just a few simple examples of how researchers might use Picture. We hope you find these examples useful. Many additional data elements are available for download using the web-based query tool in Picture. We hope you will explore the data set and find it valuable. A new edition of Picture, using data for 2004, is being prepared for release in early 2008. Soon after the release of Picture 2004, we will begin working on Picture 2006 to bring the data set reasonably up to date. After those two editions are completed, we intend to solicit suggestions from users on how we can improve the Picture series. In the meantime, readers may e-mail questions or comments to helpdesk@huduser.org.

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Ten Years of Smart Growth

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I thank Martin Klingmeyer for bringing to my attention an error in my article entitled "Ten Years of Smart Growth: A Nod to Policies Past and a Prospective Glimpse Into the Future" (*Cityscape*, Volume 9, Number 1, 2007, page 112), in which I stated that Congress passed the Land Use Planning Act of 1974 (H.R. 10294). In fact, H.R. 10294 was not enacted.