Length of Stay in Assisted Housing

Multi-Disciplinary Research Team

U.S. Department of Housing and Urban Development | Office of Policy Development and Research

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About MDRT

PD&R developed the Multidisciplinary Research Team (MDRT) vehicle to manage a team of qualified researchers. Researchers are selected for their expertise to produce an array of high quality, short-turnaround research. MDRT researchers use a variety of HUD and external data sources to answer research questions relating to HUD's priority policies and strategic goals.

Disclaimer

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Executive Summary

This research addresses the length of time that households remain in the various assisted housing programs the U.S. Department of Housing and Urban Development (HUD) administers. The research examines HUD administrative data from 1995 through 2015 and addresses four research questions:

1. **How long do HUD-assisted households stay in public housing, Housing Choice Voucher (HCV), and project-based Section 8 (examined separately)?**

The research finds that the typical household in assisted housing now stays for about 6 years. The length of stay varies by household type. Elderly households stay longer, about 9 years, while nonelderly families with children stay about 4 years.

The average length of stay varies across the major HUD programs. Households in the Housing Choice Voucher program stayed the longest, with 2015 leavers staying an average of 6.6 years and a median of 4.8 years. Households in public housing that exited in 2015 stayed an average of 5.9 years and a median of 3.0 years. Section 8 project-based households that left in 2015 had slightly shorter stays, with an average of 5.3 years and a median of 3.0 years. In each program, a substantial fraction of households have tenures exceeding the 13-year cutoff used for the survival analysis.

2. **Has length of stay changed over time and for various cohorts of households?**

The average length of stay is generally increasing for most cohorts of assisted households. Tenants that left assisted housing in 2015 had stayed 6.0 years, up from 4.4 years for the 2000 leavers. Between 2000 and 2015, mean stays of leavers increased by 1.6 years in public housing, 3.0 years in the HCV program, and 0.3 years in project-based Section 8. The households that left assisted housing during the 1990s experienced some level of reduced tenure in public housing and in Section 8 project-based housing, but these reductions were small and short-lived. The households that left assisted housing from 2001 forward were all part of cohorts that had stayed in the housing incrementally longer than the preceding cohort.

Note that changes in lengths of stay in the various programs could be driven by the changing composition of the households in these programs rather than by changes in household choices. As each program increasingly serves a more elderly population, the tendency for elderly households to stay longer may be driving the increases in these programs.

3. **What factors (for example, household composition, income, or housing market conditions) influence length of stay?**

The length of stay in assisted housing is rising for all groups of assisted households, categorized by age, disability, and the presence of children. The average length of stay for elderly households grew by 1.4 to 1.5 years from 2000 to 2015. Households with disabilities saw their average stay grow by 1.2 to 1.7 years during the same period. Nonelderly families with children experienced the smallest change; their average length of stay grew by 1.1 years.

The households that stay in assisted housing and the households that exit have comparable incomes, averaging between $13,000 and $14,000 per year. These income levels place the typical assisted household below the federal poverty line, which in 2015 was about $16,000 for a two-person household and about $20,000 for a three-person household (U.S. Department of Health and Human Services, 2015).

About one-third of the households that exit assisted housing have at least some income from employment. However, income level and source of income were not found to be good predictors of length of stay. Households with more income seem to stay slightly longer in assisted housing, as do those with income from wages. Those households with income from public assistance seem to stay for shorter periods, suggesting that they may have greater housing instability.

Racial and ethnic minorities seem to stay for longer periods of time within the HCV program, but the influence of race and ethnicity is less within the public housing and the Section 8 project-based housing programs.

Market conditions influence length of stay in assisted housing in a manner suggesting substitution effects. Where the rents on housing in the private marketplace are comparatively high or the availability of rental housing is comparatively low, households in assisted housing tend to stay longer.

4. Does the distribution of stays reflect a threshold that separates households that exit early from households that stay for an extended period?

The research finds that households that remain in assisted housing tend to follow a common pattern of stays. Once admitted into one of the assisted housing programs, more than 90 percent of all assisted households remain in that housing through the first year. Exits accelerate modestly after the first year, so that 70 to 80 percent of households remain through the second year. The pace of leaving assisted housing gradually slows over time. About one-half of all assisted households leave by 4 to 6 years after entry, and about 80 percent leave by years 9 to 11.

Introduction

A household enters an assisted housing program by demonstrating income eligibility, usually after a lengthy waiting period often measured in years (Smith et al., 2015). Once in an assisted housing program, usually the household may remain for an indefinite period of time. A household may leave assisted housing for any number of reasons, including change of household needs, eviction for noncompliance with program or landlord rules, loss of income, or graduating out of need as income rises.

In order to inform budget and policy decisions concerning the various rental assistance programs, the U.S. Department of Housing and Urban Development (HUD) needs accurate and reliable length-of-stay estimates for households in the subsidized housing programs it administers (Thompson, 2007).

The objective of this research project is to use the HUD administrative data to analyze specific cohorts of assisted households over time to obtain as complete a picture as possible of the influences of actual household experiences on length of stay in assisted housing programs. These programs include the public housing program, the Housing Choice Voucher (HCV) program, and the Section 8 New Construction/Substantial Rehabilitation project-based housing program.

This research uses administrative data from HUD to track specific cohorts of assisted households over time to obtain a more complete picture of actual household experiences and to ascertain whether—and for which households—lengths of stay may have changed over time. The analysis separately examines each of HUD's major program categories (public housing, HCVs, and project-based Section 8).[1] The analysis examines these programs over time with the time spans varying as a function of the available data.

The analysis looks at income level, source of income (for example, income from wages and income from public assistance) and various household characteristics (for example, comparing elderly, disabled, and nonelderly nondisabled households), as well as housing market conditions (for example, tight vs. soft markets) that influence the length of stay of various cohorts of assisted households. In addition to basic length of stay, the analysis replicates and extends the research literature by including survival analysis and other alternative methods that provide a realistic picture of how long households remain in assisted housing.

The research questions addressed are:

1. How long do HUD-assisted households stay in public housing, HCV, and project-based Section 8 (examined separately)?

[1] Section 8 project-based housing has the federal assistance payment attached to the unit, whether through project-based vouchers or conventional project-based assistance contracts. Tenant-based vouchers and Section 8 certificates are included in the HCV program.

2. Has length of stay changed over time and for various cohorts of households (from 1995 to the present)?
3. What factors (for example, household composition, income, or housing market conditions) influence length of stay?
4. Does the distribution of stays reflect a threshold that separates households that exit early from households that stay for an extended period?

The analysis employs a survival analysis approach that includes examination of how household characteristics as well as external market factors influence length of stay. Significant program changes, such as adjustments to payment standards, Fair Market Rent levels, and local preferences, can affect the average length of stay observed at a given point in time (Olsen et al., 2005). Changing composition in the assisted population can alter the level of turnover because some types of households, such as elderly households, may remain in the program longer than others (Ambrose, 2005; Cortes, Lam, and Fein, 2008; Freeman, 1998). Changes in HUD's data systems and the completeness and quality of reporting from local public housing authorities (PHAs) can affect estimates of the length of stay.

Point-in-time estimates of length of stay could be affected by changes in the composition of the assisted population or changes in the data collection procedures that do not represent an actual change in the pattern of decisions by households to exit the program. Much of the prior research used a point-in-time methodology to estimate the average length of stay for all households that were participating in assisted housing programs at the time of the study. The methodology used in this research examines all assisted households over a very long time period enabling identification of how lengths of stay for various cohorts have changed over time. Point-in-time studies examine average lengths of stay without firm knowledge of when a household will leave assisted housing. The longitudinal approach used in this research permits estimating the length of stay of all households that entered and exited assisted housing from 2000 to 2015, and even longer in some cases.

The research measures different lengths of stay in the assisted housing programs (public housing, HCV, and Section 8 project-based housing) for each of the types of participating households. The household descriptors found to be influential on length of stay in prior studies include—

- Presence and ages of children.
- Household composition (for example, gender of head, marital status, and so on).
- Race or ethnicity of head of household.
- Elderly and disability status.
- Income (for example, level, or poverty status) and sources (for example, wages, public assistance, and so on).

Where possible, the research generates these estimates over time spans that cover variations in programmatic and market factors that influence lengths of stay. Programmatic factors include—

- Changes in data reporting system.
- PHA participation in Moving to Work (MTW) and other special initiatives.[2]

Housing market factors have also been shown to influence length of stay (Freeman, 2005). These market factors include—

- Vacancy rate, population size, and median rents.
- Region of the country.
- Incidence of poverty.

[2] The MTW program permits high-performing PHAs greater flexibility in the administration of their project- and tenant-based funds so as to test innovative, locally designed strategies to use funds more efficiently (HUD, 2017).

Prior Research

Several pieces of research have been published addressing the factors that influence the length of stay of a household in assisted housing and the timing of the decision to leave. Most of these studies use HUD administrative data to investigate these issues. Collectively, the research demonstrates that the length of stay in assisted housing varies by program, by household type, and by the housing market conditions in which the household resides.

Hungerford (1996) was the first to venture into explaining variation in the length of time that an assisted household remains in a housing program. He employed a hazard model, which estimates the probability that a household will leave at any given time. He drew his data from the Survey of Income and Program Participation, a household level longitudinal panel study carried out by the U.S. Bureau of the Census. The results indicated that elderly households and female-headed households tend to remain longer in assisted housing. He found that households with greater educational attainment remain for a shorter period, as do households with children.

Bahchieva and Hosier (2001) examined administrative data from the New York City Housing Authority. The lengths of stay in public housing were found to be very long; one-half of all spells lasted 42 years or more, and one-quarter lasted 55 years or more. New York City is an exceptionally tight, high-priced housing market, and its public housing developments are generally viewed as high quality. These factors may contribute to long spells of public housing residence, which may not be the case in other housing markets. The authors found that shorter lengths of stay in public housing were associated with being young, very old, single, White, a non-Latino recent immigrant, and a nonuser of public assistance, having a higher income, and living in a smaller apartment.

These two studies did not make use of HUD administrative data. With HUD data, the research can cover a much wider study area and can capture specific variations between programs. A variety of research projects have used HUD administrative data for this purpose.

Lubell, Shroder, and Steffen (2003) used data from HUD's Multifamily Tenant Characteristics System (MTCS) and Tenant Rental Assistance Certification System (TRACS). The MTCS data cover public housing as well as Housing Choice Vouchers (HCVs). The TRACS data cover the Section 8 project-based housing developments as well as a variety of other project-based subsidy programs. The authors focused on both length of stay in assisted housing as well as whether assisted households worked. They found that five of every nine nonelderly nondisabled assisted tenants are employed. They found that the median length of stay was 4.69 years in public housing and 3.08 years in the voucher program. The shortest stays were found among households with children and the longest among elderly households and households with disabilities.

Olsen, Davis, and Carrillo (2005) looked at HUD data from 1995 to 2002 to estimate differences in attrition rates among households in the HCV program, but not the various HUD project-based programs. The authors found that elderly or disabled households are less likely to leave the program. The authors found that the prevailing vacancy rate in the market influenced decisions

to leave, with greater vacancy rates associated with a lower probability of leaving assisted housing. The authors argue that vacancy rates not only describe market softness but also moving costs, leading to ambiguous expectations for this relationship. A significant contribution of their research is the analysis of administrative decisions by PHAs. The authors find that large decreases in the voucher program's payment standard, which sets a ceiling on the maximum amount of subsidy that can be given to any one household, will have a very small effect on program attrition. The same is true for increases in the tenant contribution, that is, the share of the income of each household that must be contribute toward payment of rent and utilities.

Ambrose (2005) examines households in both the tenant-based HCV program as well as households in the project-based public housing and Section 8 programs. Rather than looking at the length of stay in assisted housing, he employs a hazard rate approach which models the influences on a household's decision to leave assisted housing at any given point in time. He finds that characteristics of both households and housing markets influence that decision. Among the household characteristics, the likelihood of leaving a program increases with the presence of children and larger households and decreases among households that are elderly, disabled, Black or Hispanic. Among employed households, he finds limited support for the idea that increased wages increase the likelihood of leaving public housing, but not other programs. The same is true with income level generally; higher income households are more likely to leave. He finds mixed results on the influence of housing market characteristics. Greater poverty in the neighborhood decreases the probability of leaving assisted housing, but higher educational attainment among the neighborhood population increases the probability of leaving. Finally, the greater the level of housing price appreciation in the market, the lower the level of leaving housing assistance. Ambrose notes the similarities of his findings with Hungerford (1996) from the previous decade.

Cortes, Lam, and Fein (2008) found that the demographic profile and household composition of assisted tenants have changed, and such changes influence the length of stay. Their study particularly focused on how the presence of children influenced the length of stay in the HCV program, and they found that the presence of an infant or a toddler increased a household's length of stay. The presence of other children in the same household, however, reduced the effect. The presence of teenagers, especially male teenagers, reduced the length of stay.

Climaco et al. (2008) examined only households in the HCV program, focusing on the use of the portability feature of the program. They examined households that received voucher assistance from 1998 to 2005, finding that 8.9 percent made a portability move. The rate of portability movers was highest among Black households (10.3 percent) compared with White households (8.1 percent) and Hispanic households (8.6 percent). Households with young children or with a younger head of household were more likely to make a portability move than HCV households as a whole. The length of stay in the HCV program is influenced by portability moves, as these moves are most likely to occur between the fourth and fifth years of participation. The authors found that HCV households that made portability moves relocated to census tracts with lower poverty rates.

Haley and Gray (2008) looked at only those households in Section 202 supportive housing for elderly people. Their study period was limited to a single year, 2006. They found that residents of Section 202 housing developments had a median stay of 4 years, with 18 percent of all households residing in the housing for more than 10 years. Typically, elderly persons admitted to Section 202 projects reside for longer periods of time in this kind of housing than do elderly households admitted to public housing or other multifamily assisted housing, or elderly using HCVs.

Smith et al. (2015) make an important contribution to the research on length of stay in assisted housing. They used data from the Urban Institute's HOPE VI Panel study to look at what happens to housing assistance leavers. This panel followed 887 households from five housing developments from 2001 to 2005. During that period, 103 households left housing assistance. The authors found that households leave housing assistance for both positive and negative reasons. Positive reasons include marriage or a wage increase; negative reasons include breaking program rules, being evicted, or being relocated. The housing assistance leavers were found to be doing better than those still in public housing or receiving rent subsidies; they had higher incomes, were more likely to be married, and lived in lower poverty, and in safer communities. Not surprisingly, households that left for negative reasons were found to be worse off than those households that left for positive reasons.

The prior research confirms that multiple factors influence that amount of time that a household resides in assisted housing.

These factors include demographic factors such as—

- **Age**: elderly households generally stay longer.
- **Disabled**: households with disabled individuals generally stay longer.
- **Children**: the presence of children in a household tends to shorten the stay.
- **Gender**: female-headed households tend to stay longer.
- **Race**: minority households, especially Black households, tend to stay longer but also tend to make greater use of portability moves within the HCV program.
- **Income**: higher income is associated with a shorter stay.
- **Welfare**: the lower income with welfare usage is associated with longer stays.
- **Education**: higher levels of educational attainment are associated with shorter stays.

These factors include market conditions such as:

- **Vacancy**: researchers disagree on the influence of vacancy rates. Some research suggests that tights markets (low vacancy rates) inhibit moving, thus lengthening stays in assisted housing. Other research suggests that soft markets (high vacancy rates) contributed to longer stays.
- **Prices**: a high level of rent and rent inflation is associated with longer stays.

These factors include administrative decisions within the HCV program such as—

- **Payment standards**: decreases in payment standards are not associated with households leaving the program.
- **Tenant contribution**: increases in the tenant's contribution toward rent causes greater program attrition.

This information guides the current analysis of length of stay in assisted housing.

Methods and Data

This research assesses the length of stay in assisted housing by households. The research uses methods that calculate the period of assistance for different types of households, in different types of markets, confronting different sets of administrative procedures.

It is important to note at the outset that changes in length of stay vary by household type, by program, and by housing market conditions. All these variations are examined. The reasons that a household chooses to leave assisted housing are not recorded in the administrative data. Thus, it is not known if a household left because their income rose so that the household graduated out of assisted housing, or if the household had to leave due to noncompliance or breakup of a household. Whatever the cause, variations in the length of stay in assisted housing can be seen across different household groups. The programs are increasingly serving older populations, so the lengths of stay in these programs will become longer, as elderly households are prone to longer stays. Variations in length of stay can be seen across different housing markets. As rents continue to rise faster than inflation and faster than the incomes of renter households, extremely low-income renter households will have fewer and fewer private market alternatives, preventing them from leaving assisted housing. HUD administrative data were explored to parse out these variations.

Administrative data are not always complete or accurate. As was true with prior research, many household records contain suspect information requiring decisions on treatment of these troublesome data records. Households with missing data, miscoded data, and otherwise suspect data were omitted.

The research examined individual households to assess whether tenant behavior changes over time through a cohort-based method. This method can provide accurate, readily understandable, longitudinal descriptions of the assisted population's lengths of stay in assisted housing. These lengths of stay are analyzed across different points in time, across households of different types, and across different housing markets, all which may affect households' decisions to exit the various public assistance programs.

The household data were drawn from HUD's administrative data. These household level data were merged with American Community Survey, or ACS, data describing demographic, housing, and economic conditions of the markets where the assisted households reside.

The primary database for this study is the recently created Longitudinal Occupancy, Demography, and Income (LODI) file that combines data from HUD's Multifamily Tenant Characteristics System (MTCS) and Tenant Rental Assistance Certification System (TRACS) for 1995 through 2015. This 21-year timeframe offers the opportunity to better examine any changes over time in the length of stay of households in any of the three major HUD rental assistance programs.

The data were collected from three types of files. For the years 2003 through 2015, the data came from the combined LODI reporting system, which contains data from the three major programs. For the years 1995 through 2002, the data came from two separate systems. The MTCS data cover public housing as well as tenant-based vouchers combined with the previous Section 8 Certificate program. The TRACS data cover the various Section 8 project-based programs as well as a variety of other multifamily programs. The files were merged to form a single dataset covering all reported households in the following programs—

- **The Housing Choice Voucher (HCV) program:** This program includes all voucher households reported by PHAs plus Section 8 Certificates reported in 2002 or earlier but not including households in the Moving to Work (MTW) program.
- **The public housing program:** This program includes all reported public housing households from PHAs that were not in the MTW program.
- **Moving to Work public housing authorities (MTW PHAs):** This program includes all households reported by MTW PHAs whether the household is using a tenant-based voucher or project-based assistance.
- **Section 8 project-based program:** This program includes all households in units assisted by the regular Section 8 New Construction or Substantial Rehabilitation program.
- **Section 202/8:** This project-based program serves the very low-income elderly through nonprofit sponsors.
- **Section 202/811 Project Rental Assistance Contracts (PRAC) and Section 202/162 Project Assistance Contracts, or PAC:** This group of project-based programs covers housing for elderly people and persons with disabilities in which HUD provided capital advances to nonprofit sponsors.

Note that the following programs were not included in the analysis—

- The Section 8 Moderate Rehabilitation program.
- The Rent Supplement program.
- The Rental Assistance Program, or RAP.
- Section 236 program.
- Below Market Interest Rate, or BMIR, program.

Analysis

Scale of the Data in the Study

Table 1 describes the scale of the data brought to this study. More than 80 million records were included in the study. Note that this table counts all households that entered, left, or remained in each program in each year. Thus, to the extent that a household left and a new household moved in, a unit can be counted multiple times in a single reporting year. The data are less comprehensive in the early years of the automated Multifamily Tenant Characteristics System (MTCS) and Tenant Rental Assistance Certification System (TRACS) data entry systems. Thus, the numbers of households included in the data from 1995 through 1998 are smaller than in the later years, 2003 through 2015, when the data collections systems were up to speed.

Table 1 indicates—

- Data are available and reliable for the public housing program from 1995, although the level of reporting is lower from 1995 through 2002.
- The adoption of the MTW program changed the reporting requirements for the PHAs participating in that program. Thus, from 2006 forward, the MTW public housing and voucher households are reported separately.
- Data are also available for the HCV program from 1995 but are considered to be more reliable from 1999 forward.
- Data are available for the Section 8 project-based programs from 1998 forward.

Table 1 lists the percentage of reporting households in each year that ended participation in the housing assistance program. The rates of program exiting do vary from program to program and over the decades of the study period. However, the general finding is that rates of exiting rental assistance do not vary by much. Over the entire study period, the percentage of households that ended participation averaged 14 to 18 percent each year for all programs. Thus, one in five to one in seven assisted households leave each program in each year.

Table 1: Count of Assisted Households and Percent Ending Participation by Program and Year of Reporting, 1995–2015

Year of Reporting	Housing Choice Voucher[a] Households	Housing Choice Voucher[a] Percent	Public Housing[b] Households	Public Housing[b] Percent	Moving to Work[c] Households	Moving to Work[c] Percent	Section 8 Project-Based[d] Households	Section 8 Project-Based[d] Percent	Section 202/8 Households	Section 202/8 Percent	Section 202/811/162 PRAC Households	Section 202/811/162 PRAC Percent
1995	176,152	13	495,737	10	—	—	—	—	—	—	—	—
1996	238,845	14	480,771	12	—	—	—	—	—	—	—	—
1997	320,084	14	520,614	13	—	—	—	—	—	—	—	—
1998	307,090	9	342,646	10	—	—	860,593	9	193,981	7	35,554	8
1999	865,491	11	660,252	13	—	—	801,643	10	188,825	8	42,556	7
2000	1,178,121	12	883,790	13	—	—	845,762	17	198,221	13	52,230	13
2001	1,090,084	15	659,160	13	—	—	915,548	13	203,606	11	61,514	11
2002	1,023,810	15	519,920	19	—	—	852,434	14	192,555	12	65,276	11
2003	2,018,606	13	1,067,758	18	—	—	1,147,450	16	246,791	14	22,158	14
2004	2,033,948	14	1,131,311	20	—	—	1,223,538	18	253,507	15	25,655	15
2005	2,079,755	16	1,159,520	21	—	—	1,227,866	18	250,573	15	27,824	16
2006	2,231,601	17	1,277,773	23	4,067	0	1,208,650	18	247,528	15	29,558	16
2007	2,236,668	15	1,274,534	20	56,367	5	1,254,894	19	246,232	15	32,393	16
2008	2,266,021	14	1,290,500	19	106,875	12	1,238,125	19	242,021	15	33,391	16
2009	2,262,709	14	1,266,540	18	148,896	14	1,229,023	18	238,475	15	34,463	16
2010	2,239,551	14	1,282,782	18	208,619	15	1,225,216	18	236,434	15	35,948	15
2011	2,211,323	13	1,315,687	18	270,762	17	1,225,002	17	235,064	14	36,842	15
2012	2,164,736	12	1,280,553	16	248,552	5	1,219,145	18	232,829	15	37,477	16
2013	2,158,019	12	1,285,272	17	256,459	8	1,202,938	18	229,948	15	37,827	16
2014	2,159,297	12	1,328,168	20	354,135	25	1,198,642	17	229,105	15	37,954	15
2015	2,206,597	12	1,318,363	21	389,193	27	1,205,568	18	229,409	15	38,730	15
All years	33,468,508	14	20,841,651	18	2,043,925	16	20,082,037	17	4,095,104	14	687,350	14

PRAC = Project Rental Assistance Contracts.

[a] Housing Choice Voucher includes Section 8 tenant-based certificates.

[b] Public housing includes only units administered by non-Moving to Work public housing authorities.

[c] Moving to Work units include both project-based (public housing) and tenant-based (voucher) units.

[d] Section 8 project-based units do not include Section 202/8 units.

The programs differ in terms of the rates of exit:

- An average of 14 percent of participating households in the HCV program exit each year. This annual average rate of exit ranged from a low of 9 percent to a high of 17 percent, with no clear pattern over the study period.
- Households exiting the public housing program ranged from 10 percent to 23 percent, with an average of 18 percent exiting each year.
- Households in the Section 8 project-based housing developments exited at annual rates from 9 percent to 19 percent, with an average of 17 percent.
- Section 202/8 households and Section 202/811/162 households reported very low rates of exit in the early years of 1998 and 1999. These reports may be unreliable, given that they rose very sharply in 2000 and have remained relatively steady since that time. Since 2000, both sets of the Section 202 developments have experienced exit rates ranging from 11 percent to 16 percent per year.

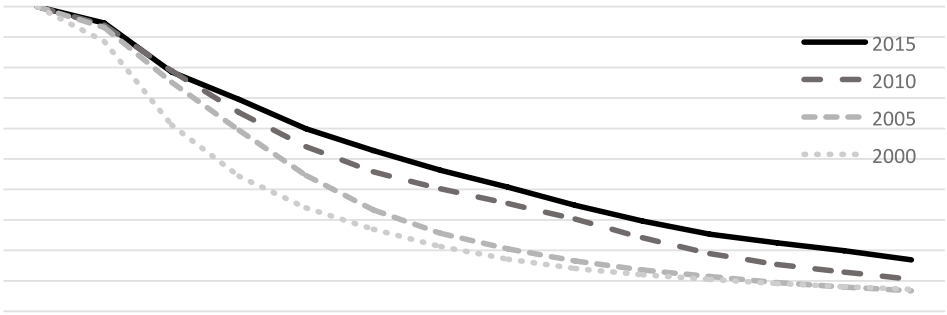
In terms of the percent of assisted households leaving the housing assistance programs in any one year, all programs peaked in the mid-2000s. Exit rates for the HCV program peaked in 2006, public housing peaked in 2006, and Section 8 project-based housing peaked in 2008. The mid-2000s were a period of turmoil in housing markets, but those problems were more keenly felt in the markets of owner-occupied housing and not in rental markets.

Survival Functions

Survival functions indicate the proportion of a selected group of assisted households that remain in assisted housing (that is, "survive") after any specified length of stay. Figure 1 presents survival functions for four cohorts of tenants for each of the three programs. The cohorts are based on households that lived in or exited from assisted housing during 4 different years: 2015, 2010, 2005, and 2000. The changes in these functions display the changing trends in the patterns of staying (or surviving) in assisted housing. The charts illustrate survival from program entry through 13 years, although a small proportion of households may stay substantially longer. Survival function illustrations have the advantage that they identify any thresholds beyond which the result is either rapid withdrawals from the programs or stabilization of the stays (Thompson, 2007). The charts answer questions such as—

- What is the general shape of the survival function?
- Does a point exist at which the result is rapid exiting from the programs?
- Does a point exist at which the pace of exiting stabilizes?
- How do the programs compare with each other?

Figure 1: Survival Functions by Household Cohort and Program



on 8 project-based housing program

Figure 1 illustrates that typically, 90 percent of households who enter assisted housing remain in assisted housing through the first year. The losses are minimal during the first year, probably due to the effects of a yearlong lease on the assisted unit. These leases have the effect of keeping households in the unit. After the first year, the survival function reflects the successive loss of households from the programs for each length of stay in years. In all cases, the figures illustrate a very standard form of survival function, with survival always decreasing but at a decreasing rate over time.

For the HCV program, the shape of the survival functions has not changed dramatically. However, they have shifted toward a horizontal axis more so than the public housing program or the Section 8 project-based program as HCV tenants are choosing to stay longer. Perhaps this shift reflects a response to worsening rental housing market conditions. After the first year, the HCV survival functions do not show any dramatic thresholds where rates of exit change substantially. There is no point at which the pace of exits stabilizes. Rather, the most recent functions for 2010 and 2015 show a steady loss of households at a gradually slowing pace.

For the public housing and project-based Section 8 programs, the survival functions have changed very little over time. Both programs, in all four periods, show a steady decline in the percentages of assisted households that remain in the program. Neither program shows evidence of any thresholds where the pace of change shifts dramatically or lengths of stay after which the pace of change stabilizes.

Length of Stay by Program

Table 2 indicates the average length of stay of households that exited the various programs by the year of exit. This table provides the means to compare the typical length of stay across the programs and over the entire study period.

The reliability of the data becomes an issue with the examination of this table. During the early years of HUD's automated tenant data systems, the reporting of household stays may have been biased. Households that lived in assisted housing for a long time prior to the automated systems often did not have their date of admission recorded. As a result, the households with complete records, including both date of admission and date of exit, may be biased toward those households that entered assisted housing only a short time before the year of exit. Thus, the length of stay figures become more trustworthy after 1998, as the automated systems matured.

With this caveat, it is apparent that the length of stay in assisted housing has grown longer in all programs over the study period. In 2000, the typical household that ended participation in assisted housing had lived in that housing for 4.4 years. By 2015, the typical household that ended participation had lived in assisted housing for 6.0 years, an increase of 1.6 years.

Table 2: Average Length of Stay of Households in Assisted Housing by Program by Year of Exit

Year of Exit	Housing Choice Voucher[a]	Public Housing[b]	Moving to Work[c]	Section 8 Project-Based[d]	Section 202/8	Section 202/811/162 PRAC	All Programs
1995	0.9	4.6	—	—	—	—	3.5
1996	1.3	4.8	—	—	—	—	3.5
1997	1.6	4.6	—	—	—	—	3.4
1998	1.7	4.2	—	5.3	6.2	2.0	4.5
1999	2.6	3.9	—	5.0	6.2	2.2	3.8
2000	3.6	4.3	—	5.0	6.2	2.5	4.4
2001	3.8	5.0	—	4.5	6.0	2.6	4.4
2002	3.6	5.3	—	4.5	6.1	2.8	4.4
2003	3.6	5.1	—	4.5	6.0	2.4	4.4
2004	4.0	5.7	—	4.7	6.1	2.5	4.8
2005	4.5	6.0	—	4.7	6.2	2.6	5.0
2006	4.9	6.8	5.0	4.7	6.2	2.8	5.5
2007	4.9	6.1	5.5	4.7	6.2	2.9	5.3
2008	5.1	5.6	6.2	4.8	6.2	2.9	5.2
2009	5.4	5.5	5.5	4.9	6.3	3.1	5.3
2010	5.8	5.9	6.6	5.0	6.4	3.3	5.6
2011	5.8	5.5	6.2	5.0	6.4	3.4	5.5
2012	5.7	5.4	6.1	5.0	6.5	3.5	5.4
2013	6.0	5.5	5.4	5.1	6.5	3.8	5.6
2014	6.5	5.8	6.2	5.1	6.7	4.1	5.9
2015	6.6	5.9	5.7	5.3	6.7	4.3	6.0
2015 median	4.8	3.0	4.0	3.0	4.4	2.4	3.6
Average for all years	4.9	5.6	5.9	4.9	6.3	3.0	5.1
Median for all years	3.1	2.6	4.4	2.6	4.1	1.9	2.9

PRAC = Project Rental Assistance Contracts.
[a] Housing Choice Voucher includes Section 8 tenant-based certificates.
[b] Public housing includes only units administered by non-Moving to Work public housing authorities.
[c] Moving to Work units include both project-based and tenant-based units.
[d] Section 8 project-based units do not include Section 202/8 units.

The increase in average length of stay among households that left assisted housing was greatest in the HCV program, growing by 3.0 years, from 3.6 in 2000 to 6.6 in 2015. The increase was smaller in public housing. The average length of stay by households leaving public housing was 4.6 years in 1995, falling slightly to 4.3 years in 2000, but growing to 5.9 years in 2015, an increase of 1.6 years. The Section 8 project-based housing program is more stable in terms of the length of stay than the other programs. The Section 8 program had an average length of stay of 5.0 years in 2000, rising less than one-third of a year to 5.3 years in 2015, after experiencing small increases and decreases in the intervening years.

The MTW PHAs generally followed the same trend, with increasing lengths of stay over time. Unlike the other programs, households in MTW programs showed a slight drop in average length of stay from 2014 to 2015. Because HUD gives discretion to MTW PHAs to alter their approach to delivering assisted housing and the mixing of tenant-based households with project-based households, this volatility could be expected.

The Section 202/8 developments experienced average lengths of stay that mirrored the regular Section 8 project-based developments. The special needs households served by Section 202/811 and 202/162 developments had the shortest average length of stay, but they also experienced a large proportional growth in length of stay from 2.5 years in 2000 to 4.3 years in 2015.

Length of Stay by Household Type

Prior research indicates that the length of stay in assisted housing varies with the type of household. Elderly households and households with disabilities tend to stay longer than nonelderly, nondisabled households. Households without children tend to stay longer than households with children.

By 2015, the housing assistance programs helped about 5.1 million households, up from 4.0 million in 2000. HUD categorized these households by three characteristics of household type: elderly or nonelderly, disabled or nondisabled, and with or without children. Table 3 indicates that the largest group is elderly households with no children, at 33 percent of the total. In size, the nonelderly with children follows this group, at 32 percent of the total. These findings represent a reversal in the rankings of these two categories; in 2000, nonelderly households with children was the largest household type, comprising 43 percent of the total. Growth in the population of assisted households is nearly entirely among elderly households and households with people with disabilities. These two groups grew collectively by about 1 million households from 2000 to 2015. Nonelderly households with children grew by fewer than 20,000 households during the same time period.

The message to take from table 3 is that changes in the composition of the assisted households are very likely a driver of changes in the length of stays in assisted housing. Elderly households and households containing people with disabilities are known to remain in assisted housing longer than nonelderly, nondisabled households. This shift toward more elderly and disabled households will generate longer stays in assisted housing, independent of changes in other factors.

Table 3: Households in Assisted Housing by Household Type for Years 2000, 2005, 2010 and 2015

	Year of Reporting							
	2000		2005		2010		2015	
	Households	Percent	Households	Percent	Households	Percent	Households	Percent
Household category								
Elderly No children	1,215,988	30	1,401,791	30	1,560,527	30	1,667,674	33
Nonelderly Disabled No children	503,972	12	745,588	16	900,883	17	917,370	18
Nonelderly Nondisabled No children	473,984	12	478,776	10	569,279	11	603,364	12
Elderly With children	38,030	1	45,512	1	49,934	1	49,953	1
Nonelderly Disabled With children	73,280	2	237,703	5	276,289	5	259,398	5
Nonelderly Nondisabled With children	1,742,621	43	1,823,221	39	1,819,037	35	1,630,997	32
All households	4,047,875	100	4,732,591	100	5,175,949	100	5,128,756	100
Household subtotals								
Elderly	1,254,018	31	1,447,303	31	1,610,461	31	1,717,627	33
Nonelderly	2,793,857	69	3,285,288	69	3,565,488	69	3,411,129	67
Disabled	577,252	14	983,291	21	1,177,172	23	1,176,768	23
Able-bodied	3,470,623	86	3,749,300	79	3,998,777	77	3,951,988	77
With children	1,853,931	46	2,106,436	45	2,145,260	41	1,940,348	38
No children	2,193,944	54	2,626,155	55	3,030,689	59	3,188,408	62
Elderly or disabled	1,831,270	45	2,430,594	51	2,787,633	54	2,894,395	56
Nonelderly Able-bodied	2,216,605	55	2,301,997	49	2,388,316	46	2,234,361	44

Table 4 examines average length of stay of different households by year of exit from assisted housing, combining all households from all programs. The table is organized by a household type designation used by HUD. This household type designation divides all assisted households into six categories based on three variables, which indicate if the household is (1) elderly or nonelderly, (2) disabled or nondisabled, and (3) membered with children or not.

Table 4: Average Length of Stay in Assisted Housing by Household Type by Year of Exit

Year of Exit	Elderly No Children	Nonelderly Disabled No Children	Nonelderly Nondisabled No Children	Elderly With Children	Nonelderly Disabled With Children	Nonelderly Nondisabled With Children
1995	7.4	2.9	2.4	6.3	2.3	1.9
1996	7.9	2.3	2.9	6.7	2.0	2.0
1997	7.8	2.4	2.9	7.4	2.5	2.1
1998	7.7	3.0	3.0	8.0	3.4	3.0
1999	7.3	2.8	2.8	7.2	3.1	2.7
2000	7.6	3.4	3.8	8.1	3.7	3.1
2001	7.6	3.5	3.8	7.6	3.5	3.0
2002	7.7	3.6	3.7	8.0	3.6	3.1
2003	7.8	3.6	3.7	8.2	3.6	3.0
2004	8.3	3.9	4.2	9.5	3.8	3.3
2005	8.6	4.2	4.6	10.2	4.2	3.5
2006	9.1	4.7	5.3	12.5	4.7	3.9
2007	8.7	4.5	4.9	10.2	4.4	3.7
2008	8.5	4.5	4.8	9.6	4.4	3.6
2009	8.4	4.6	4.8	9.2	4.5	3.7
2010	8.7	4.8	5.3	9.5	4.9	3.8
2011	8.7	4.8	4.9	9.0	4.9	3.8
2012	8.6	4.7	4.8	8.8	4.5	3.7
2013	8.8	4.9	5.1	9.1	4.6	3.9
2014	9.1	5.0	5.4	9.4	4.9	4.1
2015	9.1	5.1	5.5	9.5	4.9	4.2
2015 median	6.7	3.1	2.7	6.5	3.3	2.8
All years	8.5	4.4	4.5	9.5	4.4	3.5
Median for all years	5.9	2.5	2.0	5.9	2.8	2.2
Growth in years 2000–2015	1.5	1.7	1.7	1.4	1.2	1.1

Table 4 presents lengths of stay of households exiting from 1995 through 2015 for these household types, extending the period of time studied over the prior research with the caveat that some of the counts are quite small in the early years of 1995 to 2000 for some programs. Despite the longer study period, the results are generally similar to previous studies. Elderly households tend to have longer stays, at 8 to 9 years, compared with less than 5 years for nonelderly households. Households with children, which often consist of single mothers with children, tend to have shorter lengths of stay. The group of assisted households that has expanded in size most in recent years is households with disabled members. This group tends to have lengths of stay comparable to those of the nonelderly, which are well short of the stays of elderly households.

All six household types listed in table 4 experienced longer stays in assisted housing over the study period. With only a few very small exceptions, each household type's average length of stay increased with the passage of each year; however, changes from one year to the next were not dramatic, and the increases were incremental but unequal. The rank ordering of the household types by average length of stay in the late 1990s remained the same in 2015, with elderly staying longest and the nonelderly with children staying the shortest. However, the amount of growth was only slightly different. The average length of stay for elderly households grew from 1.4 to 1.5 years from 2000 to 2015. The stays for the nondisabled, nonelderly households grew from 1.1 to 1.7 years, and the stays for households with disabilities grew from 1.2 to 1.7 years.

Average length of stays can be misleading because survival functions of many shapes can have the same average. To prevent being misled by this issue but to make the analysis manageable, tables 5 through 7 follow the procedures used by Cortes, Lam, and Fein (2008). These authors examined length of stay of cohorts at three points along the survival function: the 25th, the 50th (median), and the 75th percentile for each of the three major programs. This technique discloses any dramatic shifts in the survival functions, such as a large increase or decrease in the length of stay. Any shift in the survival function will be identified as a significant change in the average length of stay at any one or all the percentiles.

Figure 1 showed that survival functions shifted for households in the HCV program with longer stays in more recent years. Table 5 helps to identify the patterns of change by household type for the HCV program, providing insights into which household types experienced the greatest shifts and in what direction. The simple answer to this issue is that all household types experienced some level of increased length of stay over time. All household types, at all three percentiles, experienced increases in the length of stay during all three periods, from 2000 to 2005, 2005 to 2010, and 2010 to 2015. The scales of the shifts were generally comparable. The 50th percentile, or median length of stay, increased, from 0.5 years to 3.3 years over the various time periods, with most increasing at the lower end of this range, from 0.5 to 1.1 years, over any 5-year period. The largest 5-year increases in median stays were more than 2 years for elderly households with no children and more than 3 years for elderly households with children. Only one exception to the pattern of growth in length of stay for the HCV households exists; the nondisabled elderly with children experienced a slight reduction in the median length of stay from 2010 to 2015. It is worth noting that this cohort had one of the longest lengths of stay among all the assisted households at more than 7 years at the median. Thus, a slight downward shift is unremarkable for this already long-tenured population.

Table 5: Length of Stay of Households in the Housing Choice Voucher Program by Household Type for Year of Exit

Year of Exit	Percentile	Elderly No Children	Nonelderly Disabled No Children	Nonelderly Nondisabled No Children	Elderly With Children	Nonelderly Disabled With Children	Nonelderly Nondisabled With Children
2000	25th	1.7	0.9	0.9	1.3	0.9	0.9
	50th	4.6	1.8	2.1	3.3	2.0	1.9
	75th	10.3	4.2	5.7	8.2	4.6	4.0
2005	25th	2.6	1.4	1.2	2.3	1.5	1.3
	50th	5.1	2.9	2.8	4.4	2.9	2.7
	75th	10.4	5.3	6.0	8.5	5.0	4.6
2010	25th	3.1	1.7	1.4	3.4	1.9	1.6
	50th	7.2	3.9	3.9	7.7	3.9	3.3
	75th	11.8	8.2	8.9	12.1	8.0	7.0
2015	25th	3.6	1.7	1.4	3.4	1.9	1.8
	50th	8.0	4.2	4.3	7.3	4.4	4.1
	75th	13.7	8.8	10.2	13.1	8.3	7.8

The survival functions for the public housing households and the Section 8 project-based households did not shift by much. Thus, the value of tables 6 and 7 is to determine whether the lengths of stay among exiting households remained stable for all household types. It is possible that the stable overall survival functions masked significant shifts in different directions between household types that washed out when combined. The message from these two tables is that both public housing and Section 8 project-based housing experienced, with only minor exceptions, very small shifts in lengths of stay across all household types across all time periods.

Table 6: Length of Stay of Households in the Public Housing Program by Household Type for Year of Exit

Year of Exit	Percentile	Elderly No Children	Nonelderly Disabled No Children	Nonelderly Nondisabled No Children	Elderly With Children	Nonelderly Disabled With Children	Nonelderly Nondisabled With Children
2000	25th	2.1	0.6	0.5	1.5	0.8	0.7
	50th	5.8	1.7	1.2	4.8	1.8	1.6
	75th	12.9	4.0	3.4	16.9	4.4	3.5
2005	25th	2.9	0.9	0.7	3.0	0.9	0.9
	50th	7.3	2.3	2.0	9.5	2.4	2.0
	75th	15.9	5.3	5.7	25.8	5.5	4.3
2010	25th	2.9	1.0	0.9	2.4	1.1	0.9
	50th	7.1	2.5	2.1	6.3	2.4	2.0
	75th	14.6	5.6	5.8	16.6	5.3	4.1
2015	25th	3.0	1.1	0.9	2.4	1.1	1.0
	50th	7.6	2.7	2.4	6.5	2.5	2.3
	75th	15.6	6.1	6.5	15.4	5.4	4.7

Table 7: Length of Stay of Households in the Section 8 Project-Based Housing Program by Household Type for Year of Exit

Year of Exit	Percentile	Elderly No Children	Nonelderly Disabled No Children	Nonelderly Nondisabled No Children	Elderly With Children	Nonelderly Disabled With Children	Nonelderly Nondisabled With Children
2000	25th	2.4	1.0	0.7	2.4	1.0	0.9
	50th	6.2	2.2	1.8	6.1	2.2	1.9
	75th	13.1	5.4	4.8	15.0	5.4	4.1
2005	25th	2.3	0.9	0.7	1.8	1.0	0.9
	50th	6.0	2.1	1.6	4.5	2.1	1.9
	75th	12.7	4.7	3.6	12.1	4.7	3.7
2010	25th	2.4	0.9	0.8	2.0	1.1	0.9
	50th	6.1	2.2	1.8	5.4	2.3	1.9
	75th	12.4	4.9	4.5	12.8	4.7	3.8
2015	25th	2.6	1.1	0.9	2.2	1.1	1.0
	50th	6.5	2.6	2.0	5.4	2.7	2.3
	75th	13.1	5.7	4.9	12.0	5.8	4.5

The shifts from one time period to the next in lengths of stay were nearly all small fractions of a year. The same is true for shifts at the 25th and 75th percentiles. The only exception to this shift of any scale is the population of elderly households who are caring for children. This population largely serves as the caretakers for their grandchildren because the grandchildren's parents are no longer able to care for them, leaving elderly people to care for grandchildren (Pebley and Rudkin, 1999). This particular cohort experienced some volatility, both up and down, in terms of length of stay. It is important to realize this cohort has the longest length of stay at the upper reaches of the survival function in all three of the major programs. The 75th percentile length of stay is 12 to 15 years, compared with 4 to 10 years for the nonelderly cohorts.

Length of Stay by Race and Ethnicity

Tables 8 through 10 perform the same analysis of shifts in survival functions across the rental assistance programs, but with these tables, the comparison is across racial and ethnic groups. These tables look for significant shifts in the survival functions for various racially or ethnically defined groups of households across the three rental assistance programs. To keep the tables of a manageable scale, all households have been placed into one of four racial or ethnic groups based on the race and ethnicity of the head of household. The first three groups are households that are non-Hispanic, with separate groups for White, Black, and all Other non-Hispanic households. The fourth group contains all Hispanic households of any race.

Table 8 lists the lengths of stay along the survival functions for HCV households. All households increased their median lengths of stay over all time periods, but the increases were all small, ranging from 0.5 to 1.5 years. In all cases, the length of stay at the median was greater for minority households compared with White households. Comparing the 2015 with the 2000

cohort of exiters, median stays increased more for Black and Hispanic households than for White and Other Non-Hispanic households. Over the longer timespan, the 75th percentile length of stay increased substantially among exiters for all demographic groups.

Table 8: Length of Stay of Households in the Housing Choice Voucher Program by Household Race and Ethnicity for Year of Exit

Year of Exit	Percentile	White Non-Hispanic	Black Non-Hispanic	Other Non-Hispanic	Hispanic
2000	25th	0.9	1.1	1.0	1.0
	50th	1.8	2.5	2.5	2.3
	75th	4.3	5.1	5.9	5.7
2005	25th	1.3	1.9	1.9	1.8
	50th	2.8	3.5	3.5	3.4
	75th	5.0	6.1	6.1	6.3
2010	25th	1.5	2.1	2.0	2.0
	50th	3.3	4.9	4.4	4.9
	75th	7.4	8.9	8.5	9.1
2015	25th	1.4	2.4	1.8	2.3
	50th	3.9	5.6	5.2	5.8
	75th	8.7	10.2	10.5	10.9

The administrative data used for this analysis provide limited information about factors that could lead to disparities in length of stay in the HCV program. Studies by DeLuca, Garboden, and Rosenblatt (2013) and Krysan and Bader (2007) that examine panels of voucher households in individual cities have found that minority households confront greater challenges in their search for rental housing. These challenges may influence the perceived desirability of integrated neighborhoods. Discrimination has been found to increase the difficulty for minority households with a voucher to search for and lease units that will pass inspection (Bardo and Nguyen, 2010).

Both overall increases in length of stay for all demographic groups as well as differences for minority HCV households could be driven by the shrinking availability of units with rents below the Fair Market Rent levels that govern the program. HUD's Worst Case Housing Needs study for 2015 (Watson et al., 2017) by HUD and the Affordable Housing Needs study for 2005 (HUD PD&R, 2007) indicate that the availability of rental units below the Fair Market Rent levels fell by about 6 percent over the period from 2005 to 2015. The number of affordable and available units per 100 income-eligible households fell from 86.6 in 2005 to 81.6 in 2015. If reductions in affordable units were greater in minority-dominated rental markets, it could increase market pressure causing minority HCV households to stay longer in the assisted housing program.

Table 9 finds very small differences between non-Hispanic White households and the three minority groups, in terms of increases in median lengths of stay in public housing. This finding is very different from the increases in lengths of stay in the HCV program where, relative to White households, all minority groups increased their lengths of stay.

Table 9: Length of Stay of Households in the Public Housing Program by Household Race and Ethnicity for Year of Exit

Year of Exit	Percentile	White Non-Hispanic	Black Non-Hispanic	Other Non-Hispanic	Hispanic
2000	25th	0.6	1.0	0.8	0.8
	50th	1.6	2.3	2.3	2.1
	75th	4.4	5.6	5.9	5.4
2005	25th	0.8	1.3	1.1	1.5
	50th	2.1	3.1	2.9	4.1
	75th	5.5	7.4	7.5	10.3
2010	25th	0.9	1.4	1.4	1.5
	50th	2.3	3.1	3.3	3.6
	75th	5.7	7.1	8.1	9.0
2015	25th	0.9	1.4	1.2	1.7
	50th	2.4	3.2	3.3	4.3
	75th	6.0	7.1	8.0	10.3

Table 10 extends the comparison to the Section 8 project-based Housing program. The results are very similar to those for the public housing program. Changes in lengths of stay are generally small from one time period to the next, and the changes contain a mix of both positive changes (longer stays) and negative changes (shorter stays).

Table 10: Length of Stay of Households in the Section 8 Project-Based Housing Program by Household Race and Ethnicity for Year of Exit

Year of Exit	Percentile	White Non-Hispanic	Black Non-Hispanic	Other Non-Hispanic	Hispanic
2000	25th	1.0	1.2	1.2	1.1
	50th	2.5	2.9	3.1	2.9
	75th	7.1	6.5	7.2	7.1
2005	25th	0.5	1.3	—	1.4
	50th	0.8	1.8	—	2.0
	75th	3.7	5.1	—	10.5
2010	25th	1.0	1.2	1.0	1.2
	50th	2.5	2.7	2.6	2.7
	75th	6.4	5.7	7.3	6.5
2015	25th	1.1	1.4	1.2	1.4
	50th	2.8	3.0	3.0	3.4
	75th	7.0	6.3	7.6	7.5

Further research using household survey data is needed to explore the many possible reasons behind the longer lengths of stay in assisted housing among minority households.

Drivers of Length of Stay

Having looked at the household characteristics of race, ethnicity, age, disability and the presence of children, the analysis now turns to identification of what factors, if any, may drive the

decision to exist assisted housing. These drivers may include household income level, its source, and market conditions, such as vacancy rates and rent levels. The analysis examines individually the relationships between each of these factors and lengths of stay in assisted housing to establish expectations on the scale and direction of the relationships. After examining individual relationships, regression models are used to estimate the relationships between these drivers and lengths of stay. Given the shifting demographics of the households in assisted housing, separate models are estimated for elderly or disabled households and nonelderly or nondisabled households. These models provide insights into whether or not the simple relationships found are robust with controlling for the influence of other factors.

Length of Stay by Income Level and Source of Income

Differences in lengths of stay and changes in lengths of stay from one time period to the next could result from household factors other than race or ethnicity. Households differ by income levels and the sources of that income, both of which could influence decisions to remain in assisted housing or leave to enter the unsubsidized market. Table 11 addresses this issue.

Table 11: Correlation Between Length of Stay and Income by Source All Programs, 2015

	Number of Households	Mean Value ($)	Correlation Coefficient	Significance
Length of stay	5.2 years			
Total income	454,677	13,747	0.124	**
Adjusted total income	454,677	12,690	0.126	**
Total wage income	163,824	19,598	0.225	**
Total public assistance income	109,544	4,016	– 0.120	**

** Significant at the .01 level.

All households in the HCV, the public housing, and the Section 8 project-based programs benefit from very similar subsidy calculations. For public housing and Section 8 project-based programs, each household generally pays about 30 percent of their adjusted gross income toward the gross rent on the rental unit in which the household lives.[3] In the HCV program, the maximum subsidy provided is tied to a percentage of the local Fair Market Rent, with tenants enabled to pay more than 30 percent of their income for units renting above that level. However, the program does permit a household to pay up to 40 percent of income on housing if the household chooses to consume more housing.[4]

The rental assistance programs pay the difference between the tenant's contribution and the rent charged for the unit. All participating households are subject to similar eligibility rules limiting their participation in any of the programs. Thus, nearly all households in the programs have

[3] Some exceptions from this rule exist. In some settings, households can be subject to flat rents that can alter the tenant's required contribution as a percentage of income.

[4] McClure (2005) found that, for HCV households in 2002, 62 percent pay 31 percent of income toward rent. Another 21 percent spent more than 31 percent but not more than 40 percent of income. About 17 percent of HCV households spent more than 40 percent of income on rent, a housing cost hardship that the voucher program was designed to prevent.

extremely low incomes, generally placing them below 30 percent of the Area Median Family Income of the metropolitan area where they live or the nonmetropolitan county if they live outside of a metropolitan area. In 2015, the average household income for the assisted households was between $13,000 and $14,000, meaning that the typical household receiving housing assistance lives below poverty. For that year, the U.S. Department of Health and Human Services (2017) set the poverty guidelines at about $12,000 for a family of one, $16,000 for a family of two, and $20,000 for a family of three.

The 2015 households that lived in assisted housing through the HCV, the public housing, or the Section 8 project-based programs had a mean income of only $13,456. The 2015 households that left assisted housing had a comparable mean income at $13,747. Thus, in terms of income, the households that exited assisted housing were approximately the same as the larger population of households that remained in assisted housing. Higher or lower income does not seem to influence the decision to remain in assisted housing or to exit. A portion of these exiting households had income from employment. About 36 percent of the households exiting assisted housing had income from employment. Not surprisingly, these employed households had higher incomes than their unemployed counterparts at $21,200, with $19,598 of that income from wages. A smaller portion of the 2015 exiting households, 24 percent, had income from public assistance. The income from public assistance is much lower for these households, at only $4,016, bringing them to a total income that averaged only $11,114. Interestingly, about one-third of these public assistance recipient households also had income from employment, and that employment income was much larger, at $16,856, than the income from public assistance.

It was expected that, consistent with the research literature, household income for households in assisted housing, even with the very low income that they have, would be negatively correlated with length of stay. Those households with the least income would have been more inclined to remain in assisted housing longer. Those households with the greatest income would have a higher capacity to navigate the private, unsubsidized housing market and thus be more likely to end their time in assisted housing. Similarly, it was expected that source of income would matter. If a household had income from employment, it would seem more likely that this household could gain the extra income needed to enter the private market. Thus, income from wages was expected to be negatively correlated with length of stay. Finally, income from the various public assistance programs was expected to create the opposite effect. Income from assistance programs was expected to be positively associated with length of stay, as greater public assistance usage would be associated with greater dependency on rental assistance to meet housing needs.

None of these expectations were supported (see table 11). The correlations are all statistically significant at better than the .01 level. However, statistical significance is not policy-relevant significance. The scale of the dataset for this analysis is very large, with hundreds of thousands of households in the three major rental assistance programs in 2015. Nearly any analysis-generating statistics from a dataset this large will produce statistically significant results. Although being statistically significant, the correlation coefficients are small, with absolute

values ranging from .12 to .22. Coefficients of this scale indicate that the variables explain only about 1.4 to 4.8 percent of the variation in the dependent variable: length of stay. At the very minimum, other factors must explain much more of the variation, and more generally, the expected relationships were not found.

It remains something of an unanswered question why greater income among the eligible poor in assisted housing would be associated with longer stays in that housing rather than shorter stays and greater public assistance usage would be associated with shorter stays. Although perhaps counterintuitive at first, it may be that families receiving income from job earnings may be less stable in some respect; for instance, they may be more at risk to loss of that income due to short-term emergencies (for example, becoming sick with a low-wage job without paid sick leave), or having to move more frequently in order to find alternative employment (DeLuca, Garboden, and Rosenblatt, 2013).

Length of Stay by Rent Levels

Differences in length of stay and changes in length of stay could result from rent levels either charged to the households through the rental assistance program or from the market within which the household lives.

All the households in the HCV, public housing, and Section 8 programs pay about 30 percent of their income on housing. As a result, the burden of rent on the income of the eligible poor is roughly the same across all households. With this equivalent burden, it would be expected that higher or lower rents paid by the tenants would have no effect on length of stay other than the fact that the tenant rent reflects the incomes of the households. Table 11 indicates that tenant income is weakly, but positively, associated with length of stay. Table 12 suggests that the same holds true for tenant rent at nearly exactly the same strength of correlation. In this regard, it can be speculated that tenant rent may not be related to length of stay except through the income effect.

Table 12: Correlation Between Length of Stay and Program Rents All Programs, 2015

	Number of Households	Mean Value ($)	Correlation Coefficient	Significance
Length of stay	5.2 years			
Tenant rent amount	429,215	327	0.123	**
Flat rent amount[a]	62,774	538	0.130	**
Gross rent amount[b]	300,495	854	0.244	**

** Significant at the .01 level.
[a] Public housing only.
[b] HCV and Section 8 only.

Some households in public housing are subject to flat rents. The expectation was that flat rents, especially if set at a high level, might create pressure on households to leave public housing and enter the private market. This expectation suggests a negative and significant correlation with length of stay, but the opposite was found. The relationship between flat rent amount and length of stay for public housing households that are subject to flat rents is significant but small and positive.

Gross rents are limited in the HCV and Section 8 project-based housing programs. They are limited through the Fair Market Rents published by HUD and, for the HCV program, the payment standards associated with the Fair Market Rents. These Fair Market Rents vary considerably across the county reflecting the rents found in each individual marketplace. However, the great benefit of a household receiving housing assistance through the Section 8 program is that their housing cost burden is the generally the same, 30 percent of income, independent of the surrounding housing market conditions. Given the immunity from market pressures, it would be expected that no correlation exists between gross rents and length of stay, but the relationships is positive, statistically significant, but small. Such a relationship could be a response to a market substitution effect. If the surrounding market has higher rents, that would be expected to discourage leaving assisted housing and moving into the private marketplace, which would generate a positive correlation between gross rents and length of stay.

Length of Stay by Housing Market Conditions

The softness of the surrounding rental housing market may influence the probability that a household stays in or exits out of assisted housing. If the household has many options, especially affordable options, then it seems likely that the pace of exits from assisted housing would increase. To determine if this is the case, the households that exited assisted housing in 2015 were examined for correlations between their length of stay and measures of housing market conditions, both in the immediate census tract and, if the household resided within a Core Based Statistical Area (CBSA), in the surrounding CBSA. These correlations test whether or not the length of stay is lower for households living in census tracts with higher rental housing vacancy rates. A second test is whether or not the length of stay is lower for households living in census tracts with lower gross rent levels. Table 13 examines these issues.

Table 13: Correlation Between Length of Stay and Housing Market Conditions All Programs, 2015

	Number of Households (thousands)	Mean Value	Correlation Coefficient	Significance
Length of stay	5.96			
Census tract				
Population	423	4,456	0.050	**
Percent poverty	423	27.68	– 0.026	**
Percent minority	423	46.39	0.153	**
Median gross rent ($)	423	731.52	0.213	**
Rental vacancy rate (%)	423	8.14	– 0.082	**
CBSA				
Population	381	2,618,041	0.298	**
Percent below poverty	381	16.18	– 0.106	**
Percent minority	381	32.67	0.189	**
Median gross rent ($)	381	857.60	0.309	**
Rental vacancy rate ($)	381	8.12	– 0.137	**

CBSA = Core Based Statistical Area.
** Significant at the .01 level.

At both the tract and the CBSA level, length of stay is positively associated with population. Locations with larger populations tend to correlate with households staying longer in assisted housing. The incidence of poverty is found to have an inverse effect; the greater the level of poverty in the surrounding tract and CBSA, the shorter the length of stay, suggesting that assisted households are more willing to leave assisted housing if they are subjected to living in a high poverty setting. The incidence of the share of racial or ethnic minorities in the surrounding populations is found to have the opposite effect; the greater the incidence of minorities in the population, the longer the stay in assisted housing.

The price of housing and the availability of alternative rental housing in the marketplace are expected to influence the assisted household's decision to stay in or leave assisted housing. Both price and availability effects were found to exist. Length of stay is positively associated with rent levels, again at both the tract and CBSA levels, as would be expected. If the assisted household confronts higher rents in the surrounding neighborhood and the surrounding metropolitan area, it is more likely that the household will remain in assisted housing. Length of stay is negatively associated with rental vacancy rates at both the tract and CBSA levels, as would be expected. If the assisted household confronts tighter rental housing markets offering fewer alternative units for rent, it is more likely that the household will remain in assisted housing. None of the correlations coefficients are compellingly strong. The strongest are the coefficients for median gross rents in the tracts and the CBSAs; these coefficients are 0.26 and 0.30, respectively. Coefficients at this level explain only 7 percent and 9 percent of the total variation length of stay, leaving most of the variation to be explained by other factors.

Models Explaining Variation in Length of Stay

To this point, the analysis has examined the influence of demographic factors and market factors on length of stay in assisted housing with simple, bivariate relationships. These bivariate relationships indicate that market conditions influence length of stay decisions in the direction expected. Tight markets are associated with longer stays in assisted housing, and higher priced markets are also associated with longer stays. The bivariate relationships indicate the income and its sources matter, but not in the expected direction. Higher income among the eligible poor as well as any income from wages are both positively associated with longer stays. Income from public assistance is associated with shorter stays. The bivariate relationships indicate that demographic factors matter in the expected direction. Elderly households and households with disabled members, as well as racial or ethnic minorities, are generally associated with longer stays in assisted housing. The next step for the analysis is to move the examination to multivariate models that explain the variation in length of stay through the combined effects of demographic and market forces.

Two models were estimated, with separate models built for elderly households or households with disabled members and for the nonelderly nondisabled households. The purpose of these models was to see if the predictors of length of stay in a multivariate model differ from those suggested in the bivariate analysis. Control variables are introduced for the three major

programs. It was expected that the housing market conditions may bear more forcefully on households in the HCV program because of their dependency on the availability of rental units priced below the Fair Market Rents. Although public housing and Section 8 project-based households are not as strongly influenced by these factors, the presence of their housing stock is assured by the programs. The models include only households that left assisted housing in 2015, the most recent year for which data are available.

Table 14 provides the descriptive statistics for the variables to be tested. Models with many variables require a great deal of data, but because this study is based on the very large administrative data available from HUD, the datasets are up to the task. More than 170,000 elderly or disabled households have complete data, and nearly 200,000 nonelderly or nondisabled households have complete data. The data describe the many issues raised in the literature review and explored in the previous bivariate analysis. Regional variables have been added to the data to see if any regional effects have any influence on the length of stay.

Table 15 describes the models estimated. These models are ordinary least squares models. The dependent variables are the log of the length of stay, because the distribution of the length of stay is truncated at zero and has a positive skew because of the unlimited amount of time that a household can remain in assisted housing. The log form of the length of stay translates the variable into a normally distributed term suitable of ordinary least squares regression.

The models are statistically significant and generate coefficients that are generally of the expected sign and scale. Neither of the models is particularly impressive, in that both suffer from very low *R* squared values of .08 to .19. Thus, much more variation in length of stay is left unexplained by the models than is explained. The value of the models is not so much in the ability to explain variation in the lengths of stay. Rather, the value is in confirming that the relationships identified between length of stay and the many variables explored at the bivariate level remain statistically significant and of the same scale, when controlling for the influence of the other variables included in the model. In general, it can be said that the models confirm, at a multivariate level, what was found at the bivariate level.

The models indicate that, all else held equal, non-Hispanic Black households may stay longer than non-Hispanic White households, but Hispanic households will have shorter stays than White households. Markets with higher rents and lower vacancy rates are associated with longer stays. In 2015, households in the HCV program tended to have longer stays than households in either the public housing or the Section 8 project-based programs.

New information is also added by region. Households in the northeast regions tend to have longer stays than the other regions of the nation.

The models do suggest a few possible reversals from the relationships found with the previous bivariate results. Income is not a significant predictor of length of stay for the nonelderly, but it is for elderly households. Even though statistically significant, the estimated effect is very small. An increase of income by $10,000 for an elderly household would result in only a 0.7 year

longer stay. The presence of children in nonelderly households is associated with longer, rather than shorter, stays. It is worth noting that the low explanatory power of the models indicates that the results from these models should be viewed as suggestive and not determinative. Where the relationships found in the models and in the bivariate analysis conflict, it is unclear which methodology has come closer to identifying the true relationship.

Table 14: Models Explaining Variation in Length of Stay of Households, 2015 Descriptive Statistics

	Elderly or Disabled Households		Nonelderly or Nondisabled Households	
Variables	**Mean**	**Std. Dev.**	**Mean**	**Std. Dev.**
Dependent variables				
Length of stay HCV	4.35	3.61	2.601	3.286
Independent variables				
Program variables (HCV as reference)				
Public housing	0.29	0.45	0.29	0.45
Section 8 project-based	0.32	0.47	0.33	0.47
Demographic variables				
Number of adults	1.14	0.41	1.24	0.51
Number of children	0.24	0.73	1.64	1.33
Black household	0.31	0.46	0.50	0.50
Hispanic household	0.10	0.30	0.13	0.34
Other non-Hispanic household	0.04	0.19	0.03	0.18
Income variables				
Total annual income	13,715.78	8,034.93	14,848.44	14,581.40
Total income from wages	1,518.37	6,341.24	12,547.27	15,252.08
Total income from public assistance	419.72	1,395.81	1,453.88	2,941.49
Tenant rent	317.65	193.24	351.47	352.82
Tract variables				
Population	4,404.27	1,941.08	4,573.70	2,040.07
Percent population minority	45.36	31.26	52.00	31.80
Percent population below poverty	26.62	14.85	29.62	15.50
Percent rental stock vacant	7.69	6.07	8.34	6.36
Median gross rent	770.69	282.22	732.77	242.18
Core Based Statistical Area				
Population (thousands)	3.15	5.31	2.20	4.03
Percent population minority	32.34	18.65	33.08	18.76
Percent population below poverty	15.67	4.00	16.63	4.50
Percent rental stock vacant	7.78	2.74	8.40	2.86
Median gross rent	887.17	229.23	833.24	192.96
Region (Northeast as reference)				
Dummy for South	0.34	0.47	0.48	0.50
Dummy for West	0.15	0.36	0.12	0.32
Dummy for Midwest	0.27	0.44	0.28	0.45
Number of cases	169,053		202,299	

HCV = Housing Choice Voucher.

Table 15: Models Explaining Variation in Length of Stay of Households, 2015

	Elderly or Disabled Households		Nonelderly or Nondisabled Household	
Variables	**Coefficient**	**Significance**	**Coefficient**	**Significance**
Dependent variable				
Log of length of stay				
Independent variables				
Program variables (HCV as reference)				
Public housing	– 0.08	0.00	– 0.34	0.00
Section 8 project-based	– 0.13	0.00	– 0.33	0.00
Demographic variables				
Number of adults	0.06	0.00	0.16	0.00
Number of children	– 0.10	0.00	0.07	0.00
Black household	0.01	0.08	0.23	0.08
Hispanic household	– 0.03	0.00	0.06	0.00
Other non-Hispanic household	– 0.03	0.07	– 0.06	0.00
Income variables				
Total annual income	0.000070	0.00	– 0.000001	0.56
Total income from wages	– 0.000001	0.14	0.000005	0.00
Total income from public assistance	– 0.000020	0.00	– 0.000006	0.00
Tenant rent	– 0.002738	0.00	0.000247	0.00
Tract variables				
Population	1.3071	0.00	2.3804	0.00
Percent population minority	0.0030	0.00	0.0037	0.00
Percent population below poverty	– 0.0015	0.00	– 0.0008	0.00
Percent rental stock vacant	– 0.0046	0.00	– 0.0047	0.00
Median gross rent	0.0001	0.00	0.0003	0.00
Core Based Statistical Area				
Population (thousands)	0.0058	0.00	0.0000	0.00
Percent population minority	0.0044	0.00	0.0019	0.00
Percent population below poverty	0.0005	0.68	0.0054	0.11
Percent rental stock vacant	– 0.0057	0.00	– 0.0018	0.07
Median gross rent	0.0007	0.00	0.0009	0.00
Region (Northeast as reference)				
Dummy for South	– 0.29	0.00	– 0.34	0.00
Dummy for West	– 0.25	0.00	– 0.29	0.00
Dummy for Midwest	– 0.15	0.00	– 0.14	0.00
Constant	0.66	0.00	– 0.39	0.00
Number of cases	169,053		202,299	
R-squared statistics	0.08		0.19	

HCV = Housing Choice Voucher.

Conclusion

HUD plays a very large role in assisting extremely low-income renter households afford the cost of housing. HUD supports housing developments typically occupied by extremely low-income households through the public housing program and the Section 8 project-based housing program. HUD also funds the Housing Choice Voucher program, which supports extremely low-income households that enter the private marketplace to rent a unit. This study sought to determine, once a household begins to receive assistance through one of these three programs, how long will the household stay in the program?

This research finds that the typical household that left assisted housing recently stayed for about 6 years. Differences between types of households are stark; elderly households stayed longer at 9 years; and disabled households stayed for about 5 years, while nonelderly families with children stayed for about 4 years.

The length of stay has increased somewhat over time for all groups. The average length of stay in assisted housing grew for elderly households by 1.5, to 1.7 years, from 2000 to 2015. Households with disabilities saw their average stay grow by 1.2, to 1.7 years, during the same period. Nonelderly families with children experienced the smallest change; their average length of stay grew by 1.1 years.

Racial and ethnic minorities seem to stay for longer periods of time within the HCV program, but the influence of race and ethnicity is less within the public housing and the Section 8 project-based housing programs.

Among the eligible renter households, all of whom have very low incomes, those households with more income seem to stay longer in assisted housing as do those with income from wages. Those households with income from public assistance seem to stay for shorter periods.

Market conditions influence length of stay in assisted housing in a manner suggesting substitution effects. Where the rents on housing in the private marketplace are comparatively high or the availability of rental housing is comparatively low, households in assisted housing stay longer. Where alternative housing in the private market is expensive and scarce, households will stay longer in assisted housing.

The research finds that households that remain in assisted housing tend to follow a common pattern of stays. Once admitted into one of the assisted housing programs, more than 90 percent of all assisted household remain in that housing through the first year. From 70 to 80 percent of households remain through the second year. The pace of leaving assisted housing continues but at a decreasing rate over time. About one-half of all assisted households leave by 4 to 6 years after entry, and about 80 percent leave by years 9 to 11.

It is not surprising that the length of stay in assisted housing is increasing. Prior research suggests that this pattern has been seen in the recent past (Ambrose, 2005) and the more distant past (Hungerford, 1996).

The prior research, as well as the research presented in this report, cannot identify definitive reasons for the changes in lengths of stay in assisted housing. The research can only identify relationships that exist between lengths of stay and various forces that might influence a household's decision to leave or remain in assisted housing. The prior research, as well as this research project, confirms that length of stay is related to the household's age, presence of children, and the ability of the household to find alternative housing in the private marketplace.

Although definitive causation is beyond the scope of this study, it is likely that fundamental market forces including increasing housing costs and inadequate incomes play the greatest role. The economic forces in the U.S. rental markets are moving in a manner that probably contributed to the longer stays in assisted housing. From 2000 to 2015, the United States saw median gross rent grow by 54 percent (U.S. Bureau of the Census, 2017). This growth in rents outpaced inflation by 16 percentage points as the Consumer Price Index grew by 38 percent during the same time period (U.S. Department of Labor, 2017). The rapid growth in rents contributes to the loss of affordable housing in the nation because the incomes of renters are not keeping up with inflation, much less with the growth of rents. From 2000 to 2015, median renter incomes grew by only 31 percent (U.S. Bureau of the Census, 2017). This trend has continued for a very long time. Despite the rise and fall of prices of homes for owner-occupancy during the housing bubble, its collapse, and the recovery that followed, rents have been on a steady upward path, outpacing both inflation and renter income. As long as this pattern continues, it can be expected that the lengths of stay in assisted housing will continue to increase.

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