Housing Cost Burden in the Housing Choice Voucher Program: The Impact of HUD Program Rules

Casey Dawkins Jae Sik Jeon University of Maryland

Abstract

U.S. renters' housing cost burdens have reached historic highs, and these burdens fall most heavily on renters earning the lowest incomes. The Housing Choice Voucher (HCV) program, the nation's largest tenant-based rental assistance program, is designed to alleviate high housing cost burdens for qualifying low-income households. In theory, voucher recipients should not spend more than 40 percent of their income on rent while participating in the program, yet research finds that many HCV program participants still experience housing cost burdens in excess of this threshold.

This article examines recent trends and determinants of housing cost burdens for voucher recipients. We rely on cross-sectional and longitudinal data constructed from U.S. Department of Housing and Urban Development administrative files to characterize the prevalence of housing cost burden over the 2003-to-2015 period, explore longitudinal trajectories of voucher recipients who initially leased a unit in 2003, and examine the marginal impact of various factors on the odds of an HCV household experiencing a housing cost burden in 2015. The findings suggest that certain provisions of the HCV program, particularly local payment standards and the restriction on housing cost burden monitoring to those recently admitted or recently moved, play an important role in shaping housing cost burdens.

Introduction

U.S. renters' housing cost burdens have reached historic highs. According to JCHS (2017), the number of renters spending more than 30 percent of their income on rent rose from 14.8 million to 21.3 million between 2001 and 2014, and the number of renters spending more than 50

percent of their income on rent rose from 7.5 million to a record high of 11.4 million. According to the U.S. Department of Housing and Urban Development's (HUD's) 2017 Worst Case Housing Needs report, these high housing cost burdens fall most heavily on renters earning the lowest incomes. Of those earning less than 30 percent of the Area Median Income (AMI), 65 percent are severely cost burdened, spending more than 50 percent of their income on rent (Watson et al., 2017: table A-1A). These high housing cost burdens reduce income available to meet other important household needs. For example, JCHS (2017) found that severely cost burdened low-income households spend 53 percent less on food, healthcare, and transportation than similar households without housing cost burdens.

The Housing Choice Voucher (HCV) program, the nation's largest tenant-based rental assistance program, is designed to alleviate these high housing cost burdens for qualifying low-income households, while also expanding housing choices in a wider variety of neighborhoods that offer beneficial economic and social opportunities. Rather than limit households to government-owned or subsidized housing options, the HCV program expands the range of potential housing options to include all privately owned rental housing units that are managed by landlords willing to participate in the program. Also, because the HCV subsidy moves with the tenant, the program allows households to flexibly adjust their housing in response to changing household needs and preferences.

Eligibility for the HCV program is limited to low-income renters whose income is less than or equal to 50 percent of AMI, and local public housing agencies (PHAs) are required to allocate at least 75 percent of vouchers to those earning no more than 30 percent of the AMI. For those participating in the HCV program, HUD awards Housing Assistance Payments (HAPs) through local PHAs that cover the difference between 30 percent of a household's adjusted gross income and a payment standard that reflects the cost of renting a unit that meets HUD's Housing Quality Standards (McClure, 2005).

Although voucher recipients are required by HUD program rules to spend no more than 40 percent of their income when entering the program or moving to a new unit, research finds that more than 16 percent of HCV participants experienced housing cost burdens in excess of 40 percent in 2002 (McClure, 2005). This article relies on cross-sectional and longitudinal data constructed from HUD administrative files to characterize the prevalence of housing cost burden over the 2003-to-2015 period, explore longitudinal trajectories of voucher recipients who initially leased a unit in 2003, and examine the marginal impact of various factors on the odds of a HCV household experiencing a housing cost burden in 2015. These analyses are designed to address different aspects of the following research question: how do HUD program rules influence HCV housing cost burdens? The findings suggest that certain provisions of the HCV program play an important role in shaping housing cost burdens, particularly local payment standards and the restriction on housing cost burden monitoring to those recently admitted or recently moved.

The article is organized as follows. The next section examines relevant literature addressing recent trends in housing cost burden for U.S. households and HCV renters. Following the literature review, we discuss the data and methods, present the research findings, and conclude with a summary of the most important findings and their policy implications.

Background

Rising rents and falling renter incomes have contributed to a rental housing crisis in American cities. Rental prices peaked in 2007, steadily declined through 2007 and 2010, and have risen since (JCHS, 2017). DiPasquale and Murray (2017) found that between 1970 and 2010, incomes fell for renters in all but the highest income quintile. Between 2000 and 2010, incomes for renters in the lowest income quintile fluctuated, falling by 12 percent between 2000 and 2005, rising by 7 percent between 2005 and 2008, and falling again by 6 percent between 2008 and 2010. During the housing recession, changes in income and household composition played particularly important roles in shaping renters' cost burden trajectories (Colburn and Allen, 2018).

We know little about how voucher-assisted renters fared during the recent housing market boom-bust cycle. The most recent detailed analysis of housing cost burden in the HCV program conducted prior to the housing market recession found that, although HCV-assisted households' cost burdens were on the decline, 38 percent of HCV program participants in 2002 spent more than 31 percent of their income on housing costs, and 17 percent spent more than 40 percent of their income on housing costs (McClure, 2005). Williamson (2011) examined data from a sample of about 38,000 households residing in Florida's Low-Income Housing Tax Credit (LIHTC) properties and found that about 35 percent of LIHTC residents receiving vouchers spent more than 30 percent of household income on rent. Leopold et al. (2015) conducted a more recent analysis of HUD administrative data (from 2013) and found that 42 percent of voucher recipients earning extremely low incomes spend more than 30 percent of income on rent.

Because the HCV program is designed to reduce housing cost burdens for qualifying low-income households, why do so many voucher recipients incur high housing cost burdens? Households may choose to spend a larger proportion of their income on rent to obtain housing that is higher quality, larger, or located in more desirable neighborhoods. If higher cost burdens are associated with improved neighborhood quality, then a voucher recipient's realization of these benefits may be a positive policy outcome. Even short-term gains in access to certain local public goods, such as high-quality schools, may yield long-term gains in a child's future economic opportunities and well-being. However, if these initially higher cost burdens persist or rise over time as rents rise relative to household incomes, households may be unable to remain in their chosen housing unit to take advantage of beneficial neighborhood amenities and services.

Certain types of households may be more likely to incur higher housing cost burdens than others. McClure (2005) found that among all voucher recipients, housing cost burden is particularly high for single-parent female-headed households, larger families with children (who need larger units), and those with extremely low incomes. It is possible that low-income families with children are more strongly "tied" to location, due to reliance on local social networks for social support and financial assistance (Dawkins, 2006). Likewise, non-White households may experience housing market discrimination, limiting their ability to move to adjust housing costs. This latter explanation is consistent with McClure's (2005) finding that households headed by African-Americans are more likely than other households to spend more than 40 percent of their income on rent.

Supply-side conditions may also influence households' ability to reduce housing cost burdens upon residential mobility. Pendall (2000) found that households receiving tenant-based rental assistance are more concentrated in distressed neighborhoods when those neighborhoods have a higher concentration of rental housing, despite such households' tendency to avoid neighborhoods with very low rents. Another factor is landlords' reluctance to participate in the HCV program. Unless states or localities have adopted legislation prohibiting the discrimination against those receiving tenant-based assistance, landlords' participation in the HCV program is purely voluntary, and many landlords choose not to participate due to perceived administrative barriers or other considerations (Freeman, 2011).

HUD program rules and administrative procedures may also play a role in shaping HCV housing cost burdens. Local PHAs may prioritize admissions to households that are more or less likely to incur higher housing cost burdens over time. The Quality Housing and Work Responsibility Act of 19981 (QHWRA) expanded the discretionary authority of local PHAs and set threshold requirements for the incomes of those newly admitted to HUD programs. Since 1998, PHAs have been required to ensure that 75 percent of new voucher holders have incomes no greater than 30 percent of the AMI and that all assisted households spend no more than 40 percent of income on housing costs at the time of lease up. Beyond these requirements, PHAs have substantial discretion to prioritize assistance to different types of households. Some PHAs place priority on housing those in greatest need, whereas others place emphasis on housing those most able to move to achieve greater self-sufficiency (Devine et al., 2000). Dawkins (2007) found that since the enactment of QHWRA, PHAs increasingly have been admitting smaller families headed by older adults and fewer extremely low-income female-headed households with children, thus signaling a trend away from the types of households identified by McClure (2005) who are most likely to incur high housing cost burdens.

For those households admitted to the HCV program, HUD policies determine the subsidy payment to renters and the range of housing units from which households may choose. Prior to selecting a unit, local PHAs determine the minimum tenant payment for an HCV household, or total tenant payment (TTP), which is equal to the greater of: (1) 30 percent of monthly adjusted income, (2) 10 percent of monthly gross income, (3) the welfare rent (in as-paid states only), or (4) a minimum rent payment as determined by the local PHA. Households may contribute more than 30 percent of their income toward rent but not more than 40 percent of monthly adjusted income upon entering the HCV program or signing a new lease (HUD, 2001). Thus, at the time of initial admission or lease up, HCV-assisted renters' cost burdens are effectively constrained to be between 30 and 40 percent of household income.

After a household's minimum and maximum contribution is determined, the household selects a unit, and the rent subsidy contributed by the local PHA hinges crucially on whether the rent for the selected unit is higher or lower than the payment standard established by the local PHA (generally equal to 90 to 110 percent of the metropolitan area Fair Market Rent [FMR]). If gross rent (contract rent plus any utility allowance) is equal to or lower than the payment standard, then housing cost burden is equal to (TTP/income). In this case, since TTP is usually equal to 30

¹ "Quality Housing and Work Responsibility Act of 1998; Initial Guidance," FR-4434-N-01. Federal Register 64 (32) February 18, 1999.

percent of a household's adjusted monthly income, the cost burden would always be 30 percent or lower, regardless of the level of the payment standard. However, if gross rent is higher than the payment standard, cost burden is equal to ([gross rent – payment standard + TTP] / income). If rent is initially above the payment standard and increases over time, housing cost burden will always increase unless the payment standard is adjusted or the PHA determines that rent increases are unreasonable, based on a rent-reasonableness evaluation.

Existing research points to two unresolved questions pertaining to the influence of these HUD program rules on HCV cost burdens. First, to what extent are households' higher housing cost burdens driven by the selection of housing units priced above the local payment standard? Mc-Clure (2005) found that a large percentage of HCV households incurring cost burdens are served by PHAs that establish local payment standards below 90 percent of FMR, but his analysis does not identify whether households served by these PHAs are actually more likely to choose housing units above the payment standard. Second, do households newly admitted to the HCV program and those moving to a new unit incur lower cost burdens than other HCV program participants? Per HUD program rules, households are not required to comply with the 40-percent cap on housing cost burdens after their initial lease period. Although PHAs monitor annual adjustments to income and rents after a household signs a new lease, PHAs have limited ability to influence the rent charged by local landlords beyond the "rent reasonableness" evaluation. In hot housing markets, high percentage increases in rent may be consistent with prevailing market rents. HUD does not specify the methodology that local PHAs must follow when conducting rent-reasonableness evaluations, and some local PHAs do not conduct rent reasonableness evaluations on a regular basis (Turnham and Khadduri, 2001; Varady, Wang, and Mittal, 2007). Furthermore, a local PHA's ability to increase rent subsidies is budget-constrained, and any increase in rent subsidies reduces the number of additional vouchers that can be awarded. Although HUD adjusts tenant payments in response to income changes upon annual reexaminations, these adjustments may not keep pace with changes in income if income streams vary from month to month.

In the analyses that follow, we address this gap in existing research by addressing the following research question: how do HUD program rules influence HCV housing cost burdens? We pay particular attention to the two features of HUD program rules discussed previously. First, we examine how renting units above the payment standard contributes to housing cost burden. Second, we examine whether those newly admitted to the HCV program or those recently moving to a new unit are less likely to incur cost burdens in excess of 40 percent of income.

Data and Methods

This research relies on administrative data from HUD's Public and Indian Housing Information Center system to examine trends in HCV housing cost burden between 2003 and 2015. The data are assembled from tenant-level databases collected from the HUD-50058 Family Report form completed by local PHAs.

We rely on two primary databases for the analyses. The first database is a set of cross-sectional household-level files for each year between 2003 and 2015. These files (one for each year) include the last household record available for each household in each year for all households that successfully leased up during or prior to the year in question. Households with zero income, those that receive project-based vouchers, and those that receive vouchers from Moving to Work (MTW) PHAs are excluded from the analyses. Using these databases, we examine trends in housing cost burden over time for all HCV-assisted households. For those participating in the HCV program in the most recent period (2015), we estimate logistic regression models to examine the marginal impact of various household, housing unit, and geographic characteristics on the odds of a HCV household experiencing a housing cost burden.

We also construct a longitudinal file of those who leased up in 2003. We follow these households over time, appending observations on rental spells for each year after initial lease up until either 2015 or the year in which the household exits from the HCV program. Using this database, we examine the duration of housing cost burden, emphasizing factors associated with different housing cost burden trajectories.

In all analyses, we define housing cost burden as the ratio of the family's total contribution to housing payments (gross rent minus the household's HAP) to the household's total annual adjusted gross income. Gross rent is equal to the contract rent plus a utility allowance. HAP is defined as the lower of gross rent or the payment standard minus the TTP. We use the terms rent burden and housing cost burden interchangeably throughout the article to reflect the percentage of income spent on housing costs. We categorize housing cost burdens into the following cost burden categories: no cost burden (spending 30 percent or less of income on housing costs), moderate cost burden (spending 31 to 40 percent of income on housing costs), high cost burden (spending 41 to 50 percent of income on housing costs), and severe cost burden (spending 51 percent of income or higher on housing costs). The so-called "30 percent rule" is a standard threshold level of housing cost burden that can be traced to the Brooke Amendment to the 1968 Housing and Community Development Act.² Because voucher recipients are required to spend no more than 40 percent of income on housing upon lease up, we use the 40-percent threshold to define the second housing cost burden threshold. The 50-percent threshold corresponds to HUD's definition of severe cost burden in its Worst Case Housing Needs reports.

Findings

The discussion of research findings is organized according to three different types of analyses. The first section below examines information from the cross-sectional household-level files for each year between 2003 and 2015. The second section examines information from the longitudinal database of those households that leased up in 2003 to examine housing cost burden trajectories. The third section relies on information from the cross-sectional file of households that leased up during or prior to 2015 to estimate logistic regression models that explain the marginal impact of various household, housing unit, and geographic characteristics on the odds of an HCV household experiencing a housing cost burden. Each of these analyses addresses different aspects of the following overarching research question: how do HUD program rules influence HCV housing cost burdens?

² Housing and Community Development Act of 1969, Section 213(a). Pub. L. 91–152. December 24, 1969.

Prevalence of HCV Housing Cost Burden Over Time

Exhibit 1 displays, for each year, the total number of HCV households spending 30 percent or less of their income on rent, 31 percent or more of income on rent, between 31 and 40 percent of income on rent, between 41 and 50 percent of income on rent, 51 percent or more of income on rent, and the total number of households. Exhibit 2 displays the percentage of households falling into each of these housing cost burden categories by year (excluding the "any cost burden" category). The total sample sizes (after excluding those with project-based vouchers, those with zero income, and those served by MTW PHAs) range between 1.6 and 1.7 million households, depending on the year.

Exhibit 1

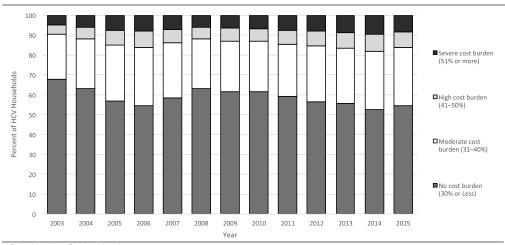
HCV Households by Extent of Housing Cost Burden, 2003–2015

	No Cost	Any Cost	Moderate Cost	High Cost	Severe Cost	
	Burden	Burden	Burden	Burden	Burden	Total
	(30% or Less)	(31% or More)	(31-40%)	(41-50%)	(51% or More)	
2003	1,095,683	517,665	360,794	78,500	78,371	1,613,348
2004	1,011,929	590,988	400,695	95,364	94,929	1,602,917
2005	904,844	684,472	447,381	117,583	119,508	1,589,316
2006	909,791	765,417	496,044	134,108	135,265	1,675,208
2007	999,470	710,429	473,754	116,054	120,621	1,709,899
2008	1,095,772	644,484	435,053	101,988	107,443	1,740,256
2009	1,066,702	666,378	440,855	110,858	114,665	1,733,080
2010	1,070,330	671,092	444,345	109,283	117,464	1,741,422
2011	1,033,761	716,661	460,935	123,229	132,497	1,750,422
2012	986,171	760,437	490,866	130,585	138,986	1,746,608
2013	952,359	755,471	472,499	136,247	146,725	1,707,830
2014	893,875	811,315	499,697	149,189	162,429	1,705,190
2015	941,798	786,958	505,710	136,846	144,402	1,728,756

HCV = Housing Choice Voucher.

Exhibit 2

Proportion of HCV Households With Specified Housing Cost Burden, 2003–2015



HCV = Housing Choice Voucher.

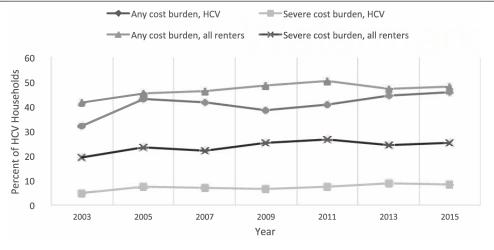
Although the total number of HCV-assisted households has remained essentially flat over the 2003to-2015 period, the total number of cost-burdened HCV households has increased by 52 percent from 517,665 in 2003 to 786,958 in 2015 (the number of cost-burdened households reached a high of 811,315 in 2014 but fell slightly in 2015). As a share of total HCV households in each year, those experiencing any level of cost burden increased by 13 percentage points, those experiencing moderate cost burdens increased by 7 percentage points, those experiencing high cost burdens increased by 3 percentage points, and those experiencing severe cost burdens increased by 4 percentage points.

The year-to-year change in housing cost burden roughly corresponds to the recent housing market boom-bust cycle. The share of HCV households experiencing housing cost burdens rose to a peak of 46 percent of households in 2006, followed by a steady decline during the housing bust. As the housing market began to recover, the share of cost-burdened HCV households rose again to a higher peak of 48 percent in 2014. These trends suggest that the increase in rental affordability during the initial years of the housing recession temporarily reduced housing cost burdens, but by 2015, housing cost burdens had risen to prerecession levels.

To provide additional context for the drop in housing cost burden during the housing bust, exhibit 3 compares the percentage of HCV renters that experienced a cost burden or a severe cost burden with the percentage of all U.S. renters experiencing the same levels of cost burden over the 2003to-2015 period as reported in the 2017 Worst Case Housing Needs Report. As this figure illustrates, the gap in housing cost burden between HCV renters and all U.S. renters widened between 2005 and 2013. One possible explanation for the cost burden gap between HCV households and all U.S. renters is that the trends in exhibits 2 and 3 were driven by newly admitted HCV households that were more likely to incur lower cost burdens. Although there was an influx of newly admitted voucher recipients during the housing bust, new admissions never comprised more than about 10 percent of all HCV program participants in any given year.

Exhibit 3





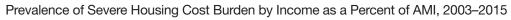
HCV = Housing Choice Voucher.

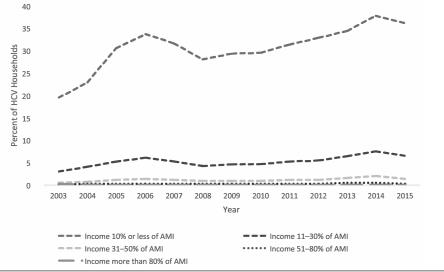
Another possible explanation for the trends in exhibits 2 and 3 is that vouchers provided a stable source of rent payment for voucher recipients that insulated these households from job loss or income shocks. This explains why housing cost burdens did not rise during the housing bust, but it does not fully explain why HCV cost burdens declined. For housing cost burdens to fall for HCV renters, rents must also have declined. In response to job losses and rising unemployment rates especially among young workers, vacancy rates rose, and real rents fell in most housing markets during the housing bust (DiPasquale, 2011). Since moving is generally less costly for renters than for owners, renters could more easily respond to changes in employment and housing market conditions, leading to downward pressure on rents in areas hit hardest by the housing bust. Collinson (2011) found that between 2007 and 2010, rents fell by 6 to 8 percentage points in the housing markets that were hit hardest by foreclosures.

How does housing cost burden vary with income? HUD annually establishes income limits by family size for its assisted housing programs that are based on AMI of the surrounding FMR area, which is typically coincident with the U.S. Census Bureau-defined metropolitan area for that year. As of 2015, the majority of HCV households in the sample (61 percent) had incomes between 11 and 30 percent of AMI, 11 percent had incomes less than 10 percent of AMI, and the remainder had incomes more than 30 percent of AMI. Among those with incomes less than 10 percent of AMI, 61 percent experienced a housing cost burden and 36 percent experienced a severe housing cost burden in 2015. Also, among those earning \$5,000 or less, 65 percent experienced a housing cost burden, and 40 percent experienced a severe housing cost burden.

Exhibit 4 displays the percentage of households within different income ranges that experienced severe housing cost burdens (51 percent or more) in each year. The gap in severe housing cost burdens between those with incomes of 10 percent or less of AMI and those with incomes of more

Exhibit 4





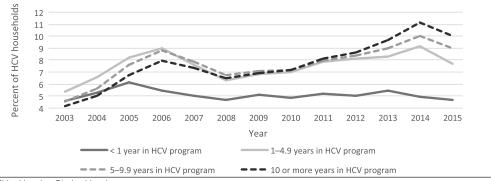
AMI = Area Median Income. HCV = Housing Choice Voucher.

than 80 percent of AMI has grown over time from 35 percentage points in 2003 to 47 percentage points in 2015. It is notable that in all years but 2003, more than 20 percent of those with incomes of 10 percent or less of AMI experienced cost burdens of 51 percent or higher, a level of cost burden that is inconsistent with HCV program goals.

The discussion in the previous section suggests that those newly admitted to the HCV program may incur lower housing cost burdens, due to HUD's 40-percent cap on housing cost burdens. Exhibit 5 displays the percentage of households that incur severe housing cost burdens by the number of years of program participation. After 2005, those newly admitted to the HCV program experienced consistently lower housing cost burdens than those who had been in the program for a longer period of time, and the gap between those newly admitted and those with longer HCV program durations generally grew over time.

Exhibit 5

Prevalence of Severe Housing Cost Burden by Length of Program Participation, 2003-2015



HCV = Housing Choice Voucher.

HCV Housing Cost Burden Trajectories

For how long do voucher recipients remain in a cost-burdened state, and how does residential mobility and the selection of a unit above the payment standard contribute to the duration of cost burden? To address this question, we rely on information from a longitudinal file of those who leased up in 2003. We follow these households over time, appending observations on rental spells for each year after initial lease up until either 2015 or the year in which the household exits from the HCV program. Using this database, we examine several descriptive statistics related to housing cost burden trajectories, including-

- Average total duration in the HCV program (years).
- Average duration in cost burden (years), separately by level of cost burden experienced.
- Percentage of households cost burdened at the beginning of the voucher contract by severity of cost burden.
- Percentage of households cost burdened at least 1 year by severity of cost burden.

- · Percentage of households cost burdened consecutively throughout the voucher contract, by severity of cost burden, separately for those who never moved and those who moved at least once since initial lease up.
- · For those who moved at least once, the average number of moves and percentage of households that increased (decreased) cost burden upon mobility.

Exhibit 6 reports each of these longitudinal statistics for those that initially leased a unit in 2003. The statistics are further disaggregated by the household's initial rent payment vis-à-vis the payment standard. On average, households that initially leased a unit in 2003 participated in the HCV program for about 6 years. Approximately 2 of those years were spent in a cost-burdened state, but for those renting a unit priced above the payment standard (73,045 or about 36 percent of all households), nearly 4 years are spent in a cost-burdened state.

Exhibit 6 Longitudinal Statistics for HCV Households That Leased a Unit in 2003

	All HCV Households	Rent ≤ Payment Standard	Rent > Payment Standard
All HCV households	204,213	131,168	73,045
Average total duration (years)	6.3	6.4	6.1
Average duration in cost burden (years)	2.4	1.7	3.8
Average duration in high cost burden (years)	8.0	0.6	1.1
Average duration in severe cost burden (years)	0.4	0.4	0.5
Cost burdened at beginning of the voucher contract (%)	37.3	5.3	94.7
High cost burdened at beginning of the voucher contract (%)	5.7	3.5	9.6
Severely cost burdened at beginning of the voucher contract (%)	3.1	2.6	4.1
Cost burdened at least 1 year (%)	64.3	46.1	97.0
High cost burdened at least 1 year (%)	30.3	24.0	41.7
Severely cost burdened at least 1 year (%)	18.0	15.4	22.6
,			
Cost burdened throughout the voucher contract (%)	16.4	1.7	42.7
High cost burdened throughout the voucher contract (%)	1.8	0.9	3.5
Severely cost burdened throughout the voucher contract (%)	0.9	0.6	1.4
HCV households that never moved	165,121	105,315	59,806
Cost burdened throughout the voucher contract (%)	19.1	2.0	49.1
High cost burdened throughout the voucher contract (%)	2.2	1.1	4.2
Severely cost burdened throughout the voucher contract (%)	1.1	0.7	1.7
All HCV households that moved since initial lease up	39,092	25,853	13,239
Average number of moves	1.4	1.4	1.4
Reduced cost burden upon mobility (%)	42.5	37.7	51.8
Increased cost burden upon mobility (%)	45.5	47.5	41.5
Cost burdened throughout the voucher contract (%)	4.9	0.6	13.5
High cost burdened throughout the voucher contract (%)	0.3	0.2	0.4
Severely cost burdened throughout the voucher contract (%)	0.1	0.1	0.1

HCV = Housing Choice Voucher.

A substantial share (37 percent) of HCV households experienced some level of cost burden, and about 3 percent experienced severe cost burdens. Since program rules preclude households from spending more than 40 percent of their income on rent at the time of lease up, this latter percentage suggests that some PHAs are not adequately monitoring and enforcing compliance with the HUD program rules. Among those renting a unit above the payment standard, nearly all (95 percent) are cost burdened upon initial lease up.

For all HCV households, 64 percent experienced a cost burden of at least 1 year or longer, and this percentage is particularly high among those initially renting a unit priced above the payment standard. Of households, 18 percent experienced a severe housing cost burden for at least 1 year. Because even a single year of high housing cost burden may spur housing instability, due to the financial pressures of moving and finding a lower cost unit, this high level of exposure to temporary cost burdens is particularly troublesome.

Our primary metric of the impact of mobility on cost-burden trajectories is the percentage of households that are cost burdened consecutively throughout their participation in the HCV program. For all households, approximately 16 percent of households fell into this category, but among those renting a unit priced above the payment standard, 43 percent were consecutively cost burdened. Mobility plays an important role in reducing exposure to consecutive cost burdens, as revealed by the statistics shown in the bottom of exhibit 6. Whereas 19 percent of households that never moved were consecutively cost burdened, less than 5 percent of those who moved since lease up were consecutively cost burdened. Among those living in a unit priced above the payment standard, the difference between movers and stayers is even larger (14 versus 49 percent). Given that only about 20 percent of households entering the program in 2003 subsequently moved to another unit, the long duration of cost burden among stayers is particularly troublesome. Although a slightly higher percentage of those who moved increased rather than reduced housing cost burdens upon mobility (46 versus 43 percent), those initially leasing a unit above the payment standard were more likely to reduce their cost burden upon mobility, whereas those initially leasing a unit below the payment standard were more likely to increase their cost burden upon mobility.

Determinants of HCV Housing Cost Burdens

In this section, we examine the marginal contribution of various household, housing unit, and geographic factors on the odds of having any cost burden, a high cost burden, or a severe cost burden in 2015 using logistic regression models. In contrast to the longitudinal analysis described in the previous section which described longitudinal trends for those who entered the HCV program and leased a unit in 2003, the analysis described here reveals the determinants of housing cost burdens for those participating in the HCV program in the most recent period for which data are available (2015).

In the logistic regression models, the dependent variable is equal to 1 if a household has a cost burden of a given level or higher and 0 otherwise. Independent variables include various factors shown in the literature to be correlated with high housing costs, including family composition, disability, age of household head, race and ethnicity of household head, income (as a percentage of AMI), and source of income. We also control for various characteristics of the housing unit selected by the voucher recipient, including number of bedrooms, housing type, and housing age. Finally,

we include various controls to capture geographic variation in regional and neighborhood (census tract) housing market conditions. The estimated regression models can be roughly interpreted as Engel curves, named for the statistician Ernst Engel, who relied on Belgian survey data to demonstrate how household food expenditure data varied with income. Regression models based on this approach typically explain expenditure shares on a given commodity as a function of income and other demographic determinants of demand (Leser, 1963; Working, 1943).

The key policy variables are an indicator of whether the household has selected a unit with a rent above the payment standard and an indicator of whether the household falls into the category of those who are monitored by HUD for compliance with the 40-percent-of-income cap. Those falling into the 40-percent cap compliance category include all recently admitted to the HCV program and all recent movers. We should note that recent mobility may influence cost burden for reasons independently of program compliance requirements. Due to the presence of mobility costs, recent movers are more likely to be in equilibrium with respect to their most preferred housing bundle compared to nonmovers (Weinberg, Friedman, and Mayo, 1981). This implies that the estimates for the HUD program compliance indicator will reflect both a pure programmatic impact and any associated impacts due to recent mobility. Although our estimates should be interpreted with this qualification in mind, no reason exists to expect that the impacts of recent mobility should exhibit a threshold at the level of 40 percent of income. For this reason, we place emphasis on differences in the impact of recent mobility and recent program admission at the 40-percent cost-burden level relative to other thresholds

We also control separately for length of HCV program participation, because program participation duration may reflect other unobserved household-level determinants of housing cost burden. For example, we might expect those with shorter HCV program durations to be more likely to rely on HCV assistance to address temporary conditions of housing instability, perhaps induced by short-term job loss or changes in family status, compared to long-term program participants who may be more heavily reliant on housing and other forms of governmental assistance. The models are estimated for the most recent period for which data are available (2015). Exhibit 7 provides a detailed description of the variable definitions and descriptive statistics for all variables used in the model, and exhibit 8 provides estimates of the logistic regression coefficients for the base models for the three different cost-burden thresholds.

The results displayed in exhibit 8 suggest that the determinants of housing cost burden differ by level of cost burden. This difference is likely due to the impact of differential programmatic requirements at different cost-burden thresholds. Since most HCV households are required to spend at least 30 percent of adjusted monthly income on rent, few will fall below this threshold, and those that do are likely to exhibit unique characteristics that exempt these households from HUD's minimum tenant payment requirements. For example, households with zero household income often receive special considerations in the calculation of cost burden, and HUD grants exceptions to minimum contribution requirements in cases of special hardship (HUD, 2001). Likewise, HUD's 40-percent-of-income cap places an upper limit on housing cost burdens for most households. The only possible explanations for incurring cost burdens above this threshold are: (1) not having recently moved or recently entered the program, (2) exceptions to the 40-percent-of-income cap granted by local PHAs, or (3) inadequate program monitoring on the part of local PHAs.

Exhibit 7

Descriptive Statistics and Variable Definitions for Logistic Regression Models

Variable	Definition	Mean	Std Dev
Dependent variable	Bollindon	Wican	Old DCI
Any cost burden	1 = A household experiences any cost burden (31% or more)	0.46	0.50
High cost burden	1 = A household experiences a high cost burden (41% or more)	0.16	0.37
Severe cost burden	1 = A household experiences a severe cost burden (51% or more)	0.08	0.28
Independent variables Rent and income			
Rent above the payment standard	1 = Gross rent above the payment standard	0.44	0.50
Income as % of AMI	1 = Total annual income 10% of less than AMI 2 = Total annual income 11–30% of AMI 3 = Total annual income 31–50% of AMI 4 = Total annual income 51–80% of AMI 5 = Total annual income more than 80% of AMI	2.19	0.78
Household characteristics			
Newly admitted or moved to a new unit	1 = New to the program or moved into a new unit	0.10	0.30
Length of participation	Length of participation (years)	7.94	6.68
Household size	Number of household members	2.39	1.58
Children	1 = A household has at least one child	0.47	0.50
Female	1 = A household head is female	0.81	0.39
Elderly	1 = A household head is elderly	0.22	0.41
Disabled	1 = A household head is disabled	0.27	0.44
Primarily wage	1 = Primary source of income is wage	0.31	0.46
Non-White	1 = A household head is non-White	0.51	0.50
Hispanic	1 = A household head is Hispanic	0.17	0.37
Housing unit type	Months of the decree	0.44	0.00
Bedroom	Number of bedrooms	2.14	0.96
Single-family Building age Geography	1 = Single-family (detached/attached) home Age of housing unit (years)	0.59 46.75	0.49 33.34
Midwest	1 = Midwest (Census region)	0.20	0.40
South	1 = South (Census region)	0.35	0.48
West	1 = West (Census region)	0.21	0.41
Metropolitan—central city	1 = Central city, metropolitan area	0.48	0.50
Metropolitan—suburb	1 = Suburb, metropolitan area	0.39	0.49
Micropolitan	1 = Micropolitan area	0.08	0.27
Neighborhood characterist	rics		
Median rent	Census-tract level median gross rent	896.79	295.55
Median rent above the FMR	1 = A census tract's median gross rent is above the FMR	0.30	0.46
Vacancy rate	Census-tract level vacancy rate	11.88	8.08
Poverty rate	Census-tract level poverty rate	21.77	13.09
% Minority population	Census-tract level percentage of minority population	53.24	32.34
% Housing voucher recipients	Census-tract level percentage of housing voucher recipients out of all renters	12.71	10.30

AMI = Area Median Income. FMR = Fair Market Rent. Std Dev = standard deviation.

Exhibit 8

Factors Associated With the Odds of a Housing Cost Burden, 2015 (Base Model)

Rent and income Rent above the payment standard 7.685*** 2.925*** 2.328*** 1.573*** -2.278***	Category	Explanatory Variable	Any Cost Burden	High Cost Burden	Severe Cost Burden
Household characteristics Newly admitted or moved to a new unit Length of participation -0.012*** -0.1547*** -1.140*** -1.547*** -1.140*** -1.547*** -1.140*** -1.547*** -1.140*** -1.547*** -1.140*** -1.547*** -1.140*** -1.140*** -1.29*** -0.301*** -0.347*** -0.347*** -0.159*** -0.301*** -0.347*** -0.159*** -0.159*** -0.159*** -0.159*** -0.159*** -0.159*** -0.159*** -0.159*** -0.159*** -0.159*** -0.169*** -0.062*** -1.267*** -0.699*** -0.662*** -1.267*** -0.446*** -0.457*** -0.075*** -0.011*** -0.056*** -0.075*** -0.101*** -0.056*** -0.075*** -0.101*** -0.056*** -0.075*** -0.101*** -0.056*** -0.075*** -0.101*** -0.056*** -0.000	Rent and income				
Household characteristics Newly admitted or moved to a new unit					
Characteristics		Income as % of AMI	- 1.538***	- 1.573***	- 2.278***
Newly admitted or moved to a new unit unit unit unit unit unit -1.547*** -1.140*** unit -1.547*** -1.140*** unit -1.547*** -1.140*** unit -1.547*** -1.140*** unit -1.547*** -1.547*** -1.140*** unit -1.267*** -0.301*** -0.347*** -0.347*** -0.159*** -0.169*** -0.069*** -0.039*** -0.699*** -0.699*** -0.699*** -0.699*** -0.699*** -0.457*** -0.446*** -0.457*** -0.467*** -0.467*** -0.467*** -0.467*** -0.467*** -0.056*** -0.075*** -0.101*** -0.052** -0.001*** -0.005*** -0.101*** -0.056*** -0.075*** -0.101*** -0.001*** -0.000***					
Length of participation	on an action of the	•	0.119***	- 1.547***	- 1.140***
Household size			- 0.012***	0.018***	0.020***
Female -0.037*** 0.078*** 0.078*** Elderly -1.267*** -0.699*** -0.699*** -0.699*** -0.699*** -0.699*** -0.699*** -0.699*** -0.699*** -0.662*** -0.446*** -0.457*** -0.457*** -0.457*** -0.457*** -0.039*** -0.030*** -0.052*** -0.056*** -0.075*** -0.101*** -0.056*** -0.075*** -0.101*** -0.056*** -0.075*** -0.101*** -0.056*** -0.075*** -0.101*** -0.056*** -0.075*** -0.101*** -0.000*** -0.000*** -0.000*** -0.000*** -0.000*** -0.000*** -0.000*** -0.000*** -0.000*** -0.000*** -0.000*** -0.000*** -0.000*** -0.000*** -0.000*** -0.000*** -0.001*** -0.011*** -0.119*** -0.060*** -0.0119*** -0.060*** -0.035** -0.0119*** -0.060*** -0.035** -0.035** -0.060*** -0.002***			- 0.129***	- 0.301***	- 0.347***
Elderly			- 0.129***	- 0.159***	- 0.150***
Disabled		Female	- 0.037***	0.078***	0.078***
Primarily wage		Elderly		- 0.699***	- 0.699***
Non-White Hispanic 0.093*** 0.030*** 0.052***		Disabled	- 1.420***	- 0.730***	
Hispanic		Primarily wage	- 0.876***	- 0.446***	- 0.457***
Housing unit type		Non-White	0.093***	0.030***	0.052***
Bedroom Single-family Si		Hispanic	- 0.056***	0.075***	0.101***
Single-family	Housing unit type				
Building age		Bedroom	0.184***	0.548***	0.678***
Midwest		Single-family			
Midwest -0.268*** 0.004 -0.022* South -0.130*** 0.171*** 0.177*** West -0.364*** 0.051*** 0.084*** Metropolitan—central city 0.210*** 0.028* 0.083*** Metropolitan—suburb 0.004 -0.136*** -0.119*** Micropolitan 0.126*** -0.060*** -0.035 Median rent Median rent above the FMR 0.179*** 0.099*** 0.100*** Vacancy rate 0.006*** -0.002*** -0.002*** Poverty rate 0.001*** 0.001*** 0.001*** 0.000*** 0.000*** 0.000*** Minority population 0.001*** 0.000*** 0.000*** 0.003*** Median rent population 0.001*** 0.002*** 0.003*** 0.003*** 0.003*** 0.001*** 0		Building age	- 0.000***	- 0.000***	0.000
South	Geography				
West		Midwest	- 0.268***	0.004	- 0.022*
Metropolitan—central city 0.210*** 0.028* 0.083*** Metropolitan—suburb 0.004 -0.136*** -0.119*** Meighborhood characteristics Vacancy rate 0.000 0.000*** 0.001*** Median rent above the FMR 0.179*** 0.099*** 0.100*** Vacancy rate 0.006*** -0.002*** -0.002*** Poverty rate 0.001*** 0.000** 0.003*** % Minority population 0.001*** 0.002*** 0.003*** % Housing voucher recipients 0.008*** -0.001*** -0.001*** Constant 0.472*** -1.002*** -0.813*** Number of observations 1,696,116 1,696,116 1,696,116 Wald chi-square 407,228.33*** 316,297.75*** 194,781.55***		South	- 0.130***	0.171***	0.177***
Metropolitan—suburb Micropolitan 0.004 0.126*** - 0.136*** - 0.060*** - 0.119*** - 0.035 Neighborhood characteristics Median rent Median rent above the FMR 0.000 0.179*** 0.000*** 0.099*** 0.001*** 0.100*** 0.100*** Vacancy rate Poverty rate Poverty rate 96 Minority population 97 Housing voucher recipients 0.001*** 0.002*** 0.003*** - 0.002*** 0.003*** 0.003*** - 0.001*** 0.001*** Constant 0.472*** 0.472*** - 1.002*** 0.696,116 - 0.813*** 1,696,116 Number of observations Wald chi-square 1,696,116 0.696,116 1,696,116 1,696,116 1,696,116		West	- 0.364***	0.051***	0.084***
Metropolitan—suburb Micropolitan 0.004 0.126*** - 0.136*** - 0.060*** - 0.119*** - 0.035 Neighborhood characteristics Median rent Median rent above the FMR 0.000 0.179*** 0.000*** 0.099*** 0.001*** 0.100*** 0.100*** Vacancy rate Poverty rate Poverty rate 96 Minority population 97 Housing voucher recipients 0.001*** 0.002*** 0.003*** - 0.002*** 0.003*** 0.003*** - 0.001*** 0.001*** Constant 0.472*** 0.472*** - 1.002*** 0.696,116 - 0.813*** 1,696,116 Number of observations Wald chi-square 1,696,116 0.696,116 1,696,116 1,696,116 1,696,116		Metropolitan—central city	0.210***	0.028*	0.083***
Neighborhood characteristics Median rent		Metropolitan—suburb			- 0.119***
characteristics Median rent Median rent above the FMR Median rent above the FMR No.179*** No.099*** No.100*** 0.001*** No.009*** No.100*** 0.002*** No.002*** No.002*** 0.002*** No.002*** No.002*** 0.002*** No.002*** No.002*** 0.001*** No.002*** No.003*** 0.003*** No.002*** No.003*** 0.001*** No.002*** No.001*** 0.001*** No.002*** No.001*** 0.001*** No.002*** No.001*** 0.001*** No.001*** No.001*** 0.001***		Micropolitan	0.126***	- 0.060***	- 0.035
Median rent above the FMR 0.179*** 0.099*** 0.100*** Vacancy rate 0.006*** -0.002*** -0.002*** Poverty rate 0.001*** -0.000 -0.000 % Minority population 0.001*** 0.002*** 0.003*** % Housing voucher recipients 0.008*** -0.001*** -0.001*** Constant 0.472*** -1.002*** -0.813*** Number of observations 1,696,116 1,696,116 1,696,116 Wald chi-square 407,228.33*** 316,297.75*** 194,781.55***	-				
Vacancy rate Poverty rate 0.006*** 0.001*** - 0.002*** - 0.000 - 0.002*** - 0.000 % Minority population % Housing voucher recipients 0.001*** 0.008*** 0.002*** - 0.001*** 0.003*** - 0.001*** Constant 0.472*** 1,696,116 - 1.002*** 1,696,116 - 0.813*** 1,696,116 Number of observations Wald chi-square 407,228.33*** 407,228.33*** 316,297.75*** 316,297.75*** 194,781.55***		Median rent	0.000	0.000***	0.001***
Poverty rate 0.001*** - 0.000 - 0.000 % Minority population 0.001*** 0.002*** 0.003*** % Housing voucher recipients 0.008*** - 0.001*** Constant 0.472*** - 1.002*** - 0.813*** Number of 0.58** 0.472*** 0.472*** 0.813*** Wald chi-square 407,228.33*** 316,297.75*** 194,781.55***		Median rent above the FMR	0.179***	0.099***	0.100***
% Minority population % Housing voucher recipients 0.001*** 0.008*** 0.002*** - 0.001*** 0.003*** - 0.001*** Constant 0.472*** - 1.002*** - 0.813*** Number of observations Wald chi-square 1,696,116 1,696,116 1,696,116 407,228.33*** 316,297.75*** 194,781.55***		Vacancy rate	0.006***	- 0.002***	- 0.002***
% Minority population % Housing voucher recipients 0.001*** 0.008*** 0.002*** - 0.001*** 0.003*** - 0.001*** Constant 0.472*** - 1.002*** - 1.002*** - 0.813*** Number of observations Wald chi-square 1,696,116 407,228.33*** 407,228.33*** 1,696,116 316,297.75*** 194,781.55***		Poverty rate	0.001***	-0.000	- 0.000
Constant 0.472*** - 1.002*** - 0.813*** Number of observations Wald chi-square 1,696,116 1,696,116 1,696,116 407,228.33*** 316,297.75*** 194,781.55***		% Minority population	0.001***	0.002***	0.003***
Number of 1,696,116 1,696,116 1,696,116 observations Wald chi-square 407,228.33*** 316,297.75*** 194,781.55***		% Housing voucher recipients	0.008***	- 0.001***	- 0.001**
observations Wald chi-square 407,228.33*** 316,297.75*** 194,781.55***	Constant		0.472***	- 1.002***	- 0.813***
Wald chi-square 407,228.33*** 316,297.75*** 194,781.55***			1,696,116	1,696,116	1,696,116
			407.228.33***	316.297.75***	194.781.55***
			,	,	,

^{***} p < 0.01. ** p < 0.05. * p < 0.1.

AMI = Area Median Income. FMR = Fair Market Rent.

Note: Northeast and Rural are omitted.

In the models explaining the probability of a high or severe cost burden, the households most likely to suffer housing cost burdens include those without children, those headed by females, those with nonelderly household heads, those without disabled household heads, those headed by non-White household heads, those headed by Hispanic household heads, those reliant on government sources of income, and those earning lower incomes. The lower incidence of housing cost burden among households headed by a person with a disability is somewhat surprising, given evidence that such households are more likely to incur high housing cost burdens (Souza et al., 2011). One possible explanation is that rents are more stable in housing units specifically targeted to persons with a disability, particularly if other HUD place-based programs subsidize rents. This finding deserves further exploration.

The higher incidence of housing cost burden among female-headed and non-White households is consistent with McClure (2005), but in contrast with McClure we find that households without children are more likely to exhibit housing cost burdens than households with children. In a separate longitudinal analysis not reported here, we found that the prevalence of severe housing cost burden by household size has varied over time. In 2006, at the height of the housing boom, 8.4 percent of large households (five or more persons) experienced severe housing cost burdens, and 5.0 percent of single-person households experienced severe housing cost burdens. This gap declined over time, and in 2015, the year under consideration in the logistic regression analysis, single-person households were slightly more likely than large households to incur severe housing cost burdens. This finding deserves additional exploration to determine the influence of changing household size and composition on housing cost burdens. It is possible that household size is not a determinant of but a response to high housing cost burden, as couples forgo the decision to have children if doing so is likely to impose a financial burden (Colburn and Allen, 2018).

Those living in larger single-family units are more likely to experience a high or severe housing cost burden. The effect of the number of bedrooms on the odds of a severe housing cost burden is more than three times larger than the effect of number of bedrooms on the odds of any housing cost burden. The influence of housing unit age varies by severity of cost burden.

Exhibit 8 also provides evidence of significant geographic variation in the determinants of housing cost burdens. Those living in the South are more likely to experience a housing cost burden than those living in other census regions. Regarding the intra-metropolitan location of households, those living in central cities experience the highest cost burdens, and those living in suburban areas experience the lowest cost burdens.

Various census tract-level characteristics shape housing cost burdens. Those living in census tracts with higher median rents, median rents above the FMR, and a higher percentage of minority residents exhibit higher housing cost burdens. After controlling for other census tract-level variables, census tract poverty rates do not influence high or severe cost burdens at statistically significant levels, although high poverty rates are associated with a lower probability of having any cost burden. The finding that the probability of high and severe cost burdens is negatively associated with vacancy rates, and the percentage of census renters receiving vouchers is consistent with the prevailing wisdom among housing policy practitioners that the HCV program is most effective in loose housing markets with high vacancy rates and a healthy supply of properties managed by landlords that accept vouchers.

The key policy variables of interest—rent above the payment standard and newly admitted or moved to a new unit—are both consistent with expectations. Those households initially paying a rent above the payment standard are much more likely to exhibit housing cost burdens at any level. Furthermore, those recently admitted to the HCV program or that have recently moved to a new unit are less likely to exhibit high and severe housing cost burdens. The differences in the sign of the new admission-recent mover coefficient between any cost burden and high or severe cost burdens suggest that HUD income caps effectively constrain households to spend within 30 and 40 percent of their income on housing when signing a new lease or entering the program. If compliance with this provision is taken as a metric of success, then the HCV program appears to be operating as expected. It is also interesting to note that after controlling for the categorical distinction between recent movers or recent admissions and other households, length of program participation is positively associated with high and severe housing cost burdens. This finding combined with the large reduction in housing cost burden associated with the receipt of income from wages suggests that households not able to work and confined to fixed incomes from different sources of government assistance are more likely to be cost burdened.

In addition to its direct impact on the probability of a housing cost burden, the categorical programmatic distinction between new movers or new admissions and other voucher recipients may also interact with other household, housing unit, and geographic variables to influence housing cost burden. To test this conjecture, exhibit 9 displays estimates from models stratified into new movers or new admissions versus all others. A key finding from this table is that renting above the payment standard has a different impact for new admissions or new movers versus others. In the model explaining the probability of a high housing cost burden (41 percent or higher), renting above the payment standard has little impact on new admissions or new movers, because these households are not allowed to take on this level of housing cost burden. Likewise, renting a unit above the payment standard actually reduces the probability of these households incurring a severe housing cost burden. For households not constrained by the HUD 40-percent-of-income requirement, the impact of renting a unit above the payment standard is positive and much larger in magnitude.

Exhibit 9 also suggests that the impact of household income is much smaller for those in the "other" category, particularly for cost burdens above the 40-percent threshold, because income changes for these households may be insufficient to offset the impact of rising rents in housing units already chosen. Several household and housing unit variables also have impacts that differ between the two samples. The magnitude of the impact of number of bedrooms on housing cost burden is much higher for those not recently admitted or recently moved, suggesting either that local PHAs are unsuccessful in adjusting rental subsidies to compensate for rising housing costs in larger units, or that mobility costs limit households' ability to adjust housing costs according to changing housing needs. The relatively higher incidence of high and severe cost burdens for non-White and Hispanic households in previous models is not statistically significant in the subsample of new admissions or new movers.

The influence of regional and census tract-level housing market characteristics also differs significantly between new admissions or new movers versus others. Although renting a unit above the FMR has a positive impact on housing cost burden across both samples, census tract median rents

Factors Associated With the Odds of a Housing Cost Burden, 2015 (Stratified Models) (1 of 2)

		Newly Admitt	Newly Admitted or Moved to a New Unit	a New Unit		Others	
Category	Explanatory Variable	Any Cost Burden	High Cost Burden	Severe Cost Burden	Any Cost Burden	High Cost Burden	Severe Cost Burden
Rent and income	Rent above the payment standard Income as % of AMI	7.627 *** -1.676 ***	0.242 ***	- 0.304 *** - 2.734 ***	7.697*** - 1.526***	3.127*** - 1.566***	2.528***
Household characteristics	Length of participation	* * * * * * * * * * * * * * * * * * * *	0.004	- 0.004	- 0.013**	0.018***	0.020**
	Housenold size Children	- 0.181 **		0.021	- 0.120***	- 0.313***	- 0.351
	Fiderly		- 0.591	- 0.558 ***	- 1.260***	- 0.698***	0.004 - 0.700***
	Disabled	- 1.377 ***	- 0.742 ***	*** 969.0 -	- 1.418*** - 0.874***	- 0.725***	- 0.659***
	Non-White Hispanic	0.064 **	0.038	0.025 0.043	0.098***	0.035***	0.057***
Housing unit type	Bedroom Single-family		0.094 ***	0.059 **	0.189***	0.570***	0.703***
	Building age	0.001	0.001	0.001	- 0.001	- 0.000	0.000
Geography	Midwest South	- 0.415 *** - 0.265 ***	- 0.323 *** - 0.193 ***	- 0.396 ***	- 0.251*** - 0.114***	0.006	- 0.021*
	West Metropolitan—central city Metropolitan—suburb Micropolitan	-0.559 *** 0.253 *** 0.011	- 0.937 *** - 0.249 *** - 0.482 ***	- 1.084 *** - 0.177 ** - 0.402 ***	-0.344*** 0.203*** 0.001	0.081***	0.119*** 0.115*** - 0.090***
			5		- - - -		9

Factors Associated with the Odds of a Housing Cost Burden, 2015 (Stratified Models) (2 of 2)

		Newly Admit	Newly Admitted or Moved to a New Unit	a New Unit		Others	
Category	Explanatory Variable	Any Cost Burden	High Cost Burden	Severe Cost Burden	Any Cost Burden	High Cost Burden	Severe Cost Burden
Neighborhood characteristics	SS						
)	Median rent	- 0.000	- 0.000	- 0.000	0.000	0.000**	0.001***
	Median rent above the FMR	0.201 ***	0.155 ***	0.176 ***	0.176***	0.099***	0.099***
	Vacancy rate	0.004 ***	0.007	*** 600.0	0.006***	- 0.003***	- 0.003***
	Poverty rate	0.005 ***	* 0.000	0.002	0.001*	- 0.001*	- 0.000
	% Minority population	- 0.001	0.001 ***	0.002 ***	0.001***	0.002***	0.003***
	% Housing voucher recipients	0.004 ***	0.000	0.001	***600.0	- 0.001***	001**
Constant		1.029 ***	1.458 ***	2.021 ***	0.427***	- 1.276***	- 1.067***
Number of observations Wald Chi-Square Pseudo R2		186,057 42,594.33 *** 0.748	186,057 13,472.68 *** 0.221	186,057 11,004.85 *** 0.310	1,510,059 365,554.96*** 0.778	1,510,059 306,387.17*** 0.345	1,510,059 179,201.01*** 0.354

AMI = Area Median Income. FMR = Fair Market Rent. Note: Northeast and Rural are omitted. *** p < 0.01. ** p < 0.05. * p < 0.1.

negatively influence housing cost burden for new admissions or new movers. Similarly, cost burdens for others are more sensitive to local vacancy rates and the presence of other HCV households.

To get a better sense of the magnitude of the impacts displayed exhibits 8 and 9, exhibit 10 displays the predicted probability of a housing cost burden at different cost burden levels, allowing the household income, rent payment vis-à-vis the payment standard, and sample to vary, while holding other independent variables at their respective means. Exhibit 10 suggests that the probability of a housing cost burden at any level is highest for those with the lowest incomes. For those earning less than 10 percent of AMI, the probability of any cost burden is nearly 100 percent. For all income levels, the probability of a housing cost burden is higher for those renting a unit above the payment standard, but new admissions or new movers are substantially less likely to exhibit cost

Exhibit 10 Predicted Probabilities of Housing Cost Burden by Income and Rent Payment

Income	Full Sa	<u> </u>	Newly Admitted or Mo to a New Unit	
income		Rent > Payment	Rent ≤ Payment	Rent > Payment
	Standard	Standard	Standard	Standard
Predicted probabilities of a	, ,			
Total annual income	13.53	99.71	18.30	99.78
10% or less than AMI				
Total annual income	3.25	98.65	4.02	98.85
11–30% of AMI				
Total annual income	0.72	94.02	0.78	94.15
31–50% of AMI				
Total annual income	0.15	77.15	0.15	75.07
51–80% of AMI				
Total annual income	0.03	42.05	0.03	36.03
more than 80% of AMI				
Predicted probabilities of h	iah cost burden (%))		
Total annual income	11.05	, 69.84	17.16	20.88
10% or less than AMI		00.01		20.00
Total annual income	2.51	32.44	2.69	3.40
11–30% of AMI				
Total annual income	0.53	9.06	0.37	0.47
31-50% of AMI				
Total annual income	0.11	2.02	0.05	0.06
51-80% of AMI				
Total annual income	0.02	0.43	0.01	0.01
more than 80% of AMI				
Predicted probabilities of s	avere cost burden /	0/5)		
Total annual income	10.58	54.84	14.01	10.72
10% or less than AMI	10.00	07.07	17.01	10.12
Total annual income	1.20	11.07	1.05	0.77
11–30% of AMI	1.20		1.00	0
Total annual income	0.12	1.26	0.07	0.05
31–50% of AMI				
Total annual income	0.01	0.13	0.00	0.00
51–80% of AMI				
Total annual income	0.00	0.01	0.00	0.00
more than 80% of AMI				
AMI – Area Median Income				

AMI = Area Median Income.

burdens when renting above the payment standard than are others. For example, the probability of a severe housing cost burden for a recent mover or new admission who earns 10 percent or less of AMI and rents a unit above the payment standard is only 11 percent, and this probability is lower than those in the same group who rent a unit below the payment standard. By comparison, in the full sample, the probability of a severe housing cost burden for a household earning 10 percent or less of AMI and renting a unit above the payment standard is 55 percent.

Conclusion and Policy Implications

This study examined trends in housing cost burden for households participating in the HCV program during the 2003-to-2015 period. We found that the number and share of HCV households experiencing a housing cost burden has increased since 2003, and the year-to-year trend in HCV cost burden roughly corresponded to the recent housing market boom-bust cycle. We observed a dip in housing cost burden during the initial years of the housing market recession, which was likely induced by increased rental market affordability during this period. By 2015, 46 percent of HCV households experienced a cost burden of 31 percent or more, 16 percent experienced a cost burden of 41 percent or more, and 8 percent experienced a cost burden of 51 percent or more. Compared to McClure (2005), who examined cost burdens in 2002 just prior to our study period, the prevalence of housing cost burdens of 31 percent or more has increased from 38 percent in 2002 to 46 percent in 2015, whereas the percentage of those spending more than 40 percent of income on housing costs has remained approximately the same.

Cross-sectional and longitudinal analyses reveal that HUD program rules play an important role in shaping housing cost burdens, particularly HUD rules governing local payment standards and the restriction on the 40 percent-of-income cost burden cap to new admissions and recent movers. For all years since 2005, those households newly admitted to the HCV program were consistently less likely to exhibit severe housing cost burdens. Those renting a unit above the payment standard in 2003 were more likely to experience a cost burden at the beginning of the voucher contract and exhibit longer housing cost burden trajectories while participating in the HCV program. Residential mobility plays an important role in reducing the incidence of housing cost burdens throughout the HCV contract, despite households initially taking on higher housing cost burdens upon mobility.

These findings hold in logistic regression models explaining the determinants of housing cost burdens at different levels. Recent admissions and new movers are less likely to exhibit high or severe housing cost burdens and are less likely to incur a high or severe housing cost burden when renting above the payment standard. Recent admissions and new movers also respond differently than others to local housing market conditions. Simulations from the regression models suggests that among those earning the lowest incomes (10 percent of AMI), new movers and recent admissions are about 44 percent less likely to incur a severe housing cost burden than the average voucher recipient, when renting a unit above the payment standard.

These findings are a double-edged sword. On the one hand, HUD's programmatic income floor and ceiling have helped to keep housing costs for voucher recipients within a range that is consistent with programmatic goals. On the other hand, our analysis suggests that housing cost burdens rise after a household's initial lease has expired. HUD's ability to keep housing cost burdens in check

is limited to some extent by the quality and frequency of local rent-reasonableness evaluations and the local payment standard provision, which places a cap on HUD's contribution toward rent. Some have suggested removing the 40-percent cost burden threshold altogether or eliminating rent reasonableness evaluations to enable households to incur higher housing costs if they so choose (Turnham and Khadduri, 2001). Our evidence suggests that without further changes to the HCV program and how it is administered by local PHAs, both the 40-percent threshold on total tenant contributions and the payment standard cap on HAPs will continue to play an important role in shaping housing cost burdens for HCV-assisted households.

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Authors

Casey Dawkins is the Director of the Urban Studies and Planning Program, the Director of the Ph.D. Program in Urban and Regional Planning and Design, associate professor of urban studies and planning, and affiliate of the National Center for Smart Growth at the School of Architecture, Planning and Preservation at the University of Maryland.

Jae Sik Jeon is a housing research analyst at Sage Computing and affiliate of the National Center for Smart Growth at the University of Maryland.

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