Safe, but Could Be Safer: Why Do HCVP Households Live in Higher Crime Neighborhoods?

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Abstract

The radical growth in the Housing Choice Voucher Program (HCVP) during the past 25 years has benefited subsidized households, granting them access to a greater array of neighborhoods. Although HCVP households tend to live in safer neighborhoods than households in supply-side subsidized housing, they still lag behind the general population in terms of neighborhood safety.

This article identifies the urban spatial characteristics that lead HCVP households to live in higher crime neighborhoods. Using census tract-level crime and housing data on 91 U.S. cities in 2000, I estimate a set of regression models that find that three housing market variables have strong associations with the crime exposure of HCVP households: (1) the percentage of renters located in high-crime neighborhoods, (2) the differential between average rents in low- and high-crime neighborhoods, and, to a lesser extent, (3) the vacancy rate in low-crime neighborhoods.

These findings suggest that the existence of tight rental markets in low-crime neighborhoods within cities makes it harder for HCVP households to access those neighborhoods. Cities with these market characteristics can respond through landlord outreach and by increasing the supply of rental housing in lower crime neighborhoods, either by reducing building restrictions or subsidizing supply.

Introduction

During the past 25 years, the U.S. Department of Housing and Urban Development (HUD) and local housing authorities have radically changed how they deliver housing subsidies to low-income households. A primary goal of these policy changes is to locate subsidized households in better neighborhoods. Although neighborhood quality is often equated with the poverty rate, policymakers and researchers increasingly use additional metrics to measure the types of neighborhoods where households live.

One of these metrics is neighborhood crime—a very important aspect of neighborhood quality, particularly for those who live in subsidized housing. Subsidized households frequently cite crime as a paramount concern and as a motivating force for wanting to leave their current neighborhoods (Goering, Feins, and Richardson, 2002; Hanratty, Pettit, and McLanahan, 1998; Rubinowitz and Rosenbaum, 2000; Wilson and Mast, 2013). These concerns are often justified, given the many documented cases of public housing projects and other clusters of subsidized housing being located in particularly dangerous neighborhoods (Kingsley and Pettit, 2008; Popkin et al., 2002; Rubinowitz and Rosenbaum, 2000). Further highlighting the relevance of crime in this context is the fact that subsidized housing legislation often emphasizes neighborhood safety. This legislation includes the landmark 1949 Housing Act requirement to provide a "suitable living environment" (Newman and Schnare, 1997) and measures in the Quality Housing and Work Responsibility Act of 1998 on safety and crime prevention.[1]

These concerns and subsequent research suggest that neighborhood crime is an important measure of neighborhood quality and that any attempts to encourage subsidized households toward better neighborhoods should be mindful of neighborhood crime. Recent work has examined the efficacy of the Housing Choice Voucher Program (HCVP) and other housing subsidies at granting access to lower crime neighborhoods (Buron et al., 2002; Feins and Shroder, 2005; Keels et al., 2005; Kling, Ludwig, and Katz, 2005; Lens, Ellen, and O'Regan, 2011). In the most recent of these studies, Lens, Ellen, and O'Regan (2011) found that HCVP households occupy safer neighborhoods than low-income housing tax credit (LIHTC) and public housing households, but they still live in neighborhoods with higher crime rates than the typical nonsubsidized household. Although all these studies provide important insights into *whether* HCVP households are accessing lower crime neighborhoods, no existing studies help us to understand *why* HCVP households may or may not be able to live in safer neighborhoods.

I address this question by examining the crime exposure of the typical HCVP household in 91 U.S. cities in 2000. Using a large sample of crime data on census tracts (which I use to proxy for neighborhoods), I attempt to identify the city and metropolitan area spatial characteristics that are associated with a greater concentration of an area's HCVP households in higher crime neighborhoods. I specifically examine the role of economic and racial segregation and the spatial characteristics of rental markets as possible drivers of increased exposure to neighborhood crime for HCVP families.

A better understanding of these relationships provides policymakers with guidance on how to improve housing subsidy delivery in a number of ways. First, identifying the cities where HCVP

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[1] Public Law 105–276.

households concentrate in higher crime neighborhoods can help these cities target efforts at mobilizing these households out of such neighborhoods, whenever possible. Second, by identifying the housing and demographic factors associated with exposure to neighborhood crime for HCVP households, we can begin to develop context-based strategies for housing subsidies. To be specific, if particular market features are associated with higher concentrations of different types of subsidized households in higher crime neighborhoods, then local policymakers can tailor their housing subsidy mixes to fit the conditions in their housing markets. Or, if these housing market features are changeable, then policymakers can work to change them. In this article, I find that three housing market characteristics are chiefly responsible for the extent to which a city's HCVP population is clustered in higher crime neighborhoods: (1) the percentage of renters in high-crime neighborhoods, (2) the gap between average rents in low- and high-crime neighborhoods, and—to a lesser extent—(3) the vacancy rate in lower crime neighborhoods. In different ways, these three variables suggest that tight rental markets—particularly in low-crime neighborhoods—make it difficult for HCVP households to access lower crime neighborhoods. In response, cities with tight rental markets should consider building affordable housing and removing zoning restrictions on housing construction in those neighborhoods.

Given that the bulk of the findings stress that tight rental markets are bad for HCVP household neighborhood safety, one potential solution is to expand the stock of affordable housing in such markets. Despite the fact that supply-side efforts to expand the affordable housing stock—chiefly the LIHTC—have been documented to locate households in higher crime neighborhoods, efforts could be made to locate these subsidies in lower crime neighborhoods. Zoning likely plays a substantial role here as well. The fact that there is less rental housing stock in lower crime neighborhoods is not likely by chance—higher income, safer neighborhoods often have a preponderance of single-family housing because that is all that cities allow. Removing some of these regulations may spur multifamily development in safer neighborhoods that a wide array of families—with or without vouchers—can afford.
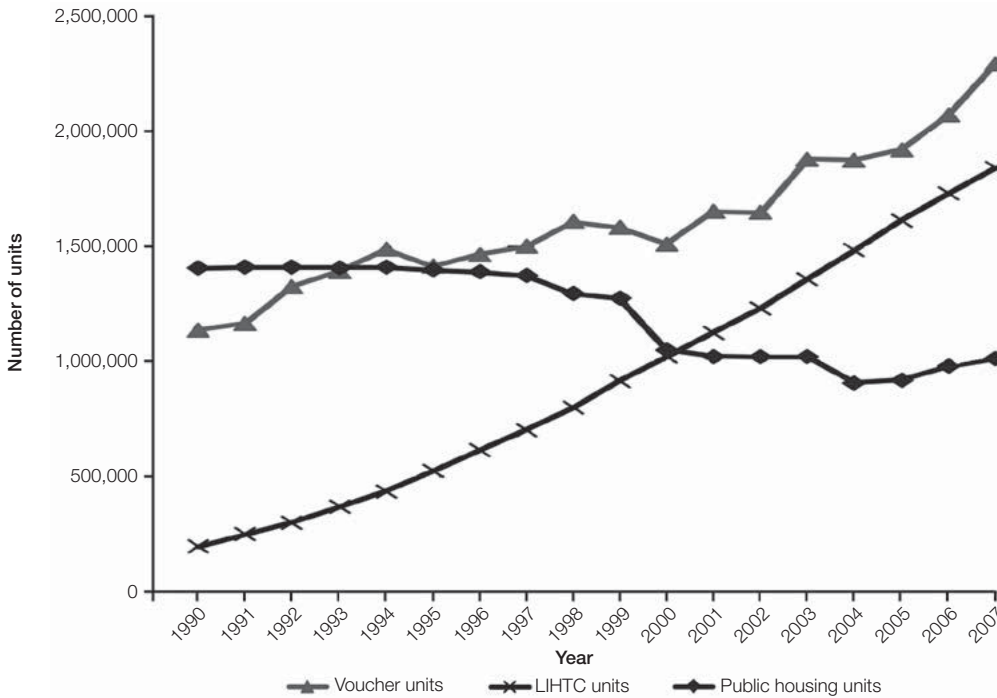
Background and Literature

Since the inception of the Section 8 voucher program (now the HCVP) in the 1970s, vouchers have steadily taken over as the primary vehicle for subsidizing housing in the United States. Exhibit 1 displays counts of voucher, LIHTC, and public housing units from 1990 to 2007. By 1990, the number of vouchers had already surpassed 1 million, but by 2007 that number had more than doubled to 2.2 million vouchers. In that year, HCVP households accounted for 44 percent of HUD-assisted households.

A number of reasons explain the dramatic rise in the voucher program. Most pertinent for this article is the increased flexibility that HCVP households have in their location choices compared with that of other subsidized households. HCVP households should be able to access a wide array of housing units, within budget constraints, rather than a fixed supply of housing, as constructed with programs such as public housing and the LIHTC. Policymakers therefore hope that HCVP households will be able to use that enhanced flexibility to access higher quality neighborhoods, or at least neighborhoods and housing that align better with household preferences. Furthermore, less

Exhibit 1

Voucher, LIHTC, and Public Housing Units by Year, 1990 to 2007

LIHTC = low-income housing tax credit.
Sources: Author's calculations of HUD data; Schwartz (2006)

stigma is attached to HCVP households than public housing, so individual households will likely be more able to locate in lower crime neighborhoods than would public housing developments, which have tended to locate in neighborhoods with few amenities and high crime and poverty rates.

HCVP households choose housing and neighborhoods with a greater set of constraints than the typical household, however. First, HCVP households have less wealth and lower incomes, potentially limiting neighborhood options. Second, landlords may stigmatize HCVP households and resist accepting applicants who list vouchers as a source of income (Freeman, 2012; Turner, Popkin, and Cunningham 1999). Finally, in making their choices, HCVP households may have limited information about alternative neighborhoods.

As noted, a growing body of work examines the extent to which the flexible (within constraints) nature of the HCVP has enabled households to reach higher opportunity neighborhoods. Researchers have a longstanding focus on poverty, but recent work has also documented the public safety concerns and conditions of subsidized households. Much of this work comes from studies on three important demonstration programs—Gautreaux, Moving to Opportunity (MTO), and HOPE VI.

Neighborhood Poverty

Research examining neighborhood poverty outcomes for subsidized households concludes that public housing tenants live in particularly high-poverty neighborhoods, and HCVP households—whether they are participants in demonstration programs or part of the general voucher-holding population—live in a wider array of neighborhoods that also have relatively high poverty rates. Pendall (2000) found that typical HCVP households live in neighborhoods with poverty rates that are 33 percent higher than the average household's neighborhood poverty rate. McClure (2006) found that similar proportions of HCVP and LIHTC households (25 and 29 percent, respectively) live in low-poverty neighborhoods. It is important to note that these proportions are greater than those for all poor renter households, although less than for all renter households. Less promising findings on HCVP come from a series of papers that found that HCVP households tend to cluster in the same neighborhoods in a number of different cities (Wang and Varady, 2005; Wang, Varady, and Wang, 2008). The general conclusion from all this work is that, although HCVP households live in lower poverty neighborhoods than traditional public housing tenants, HCVP households are still locating in high-poverty neighborhoods.

Neighborhood Crime

A smaller body of work has examined the neighborhood crime rates experienced by HCVP house-holds. Although crime is a frequent concern of both subsidized housing residents and policymakers, data on neighborhood crime are not always accessible. The earliest studies of neighborhood crime exposure for subsidized households came via examinations of the three major housing demonstration programs—Gautreaux, MTO, and HOPE VI. Although these populations are specialized even within the subsidized housing community—these households were intentionally selected or motivated to participate chiefly because they were in acutely distressed neighborhoods—their experiences shed light on what neighborhood crime conditions look like for public housing and HCVP households. These groups generally lived in very high-crime neighborhoods in their original public housing developments and chose to move to lower crime (yet still relatively unsafe) neighborhoods after receiving their vouchers.

The Gautreaux program was created in Chicago in 1976 as a result of a series of lawsuits against the Chicago Housing Authority (CHA) and HUD, and it offered African-American families in CHA housing the opportunity to move to desegregated neighborhoods around the Chicago area, includ-ing the suburbs. Rubinowitz and Rosenbaum (2000) reported a number of statistics highlighting exactly how dangerous Gautreaux participants' and other Chicago public housing residents' neigh-borhoods were. In 1980, the Robert Taylor Homes—the largest public housing development in the country at the time—comprised only 1 percent of Chicago's population but 10 percent of the city's murders, aggravated assaults, and rapes. Also according to Rubinowitz and Rosenbaum (2000), nearly one-half of Gautreaux participants reported that violent incidents occurred regularly in their neighborhoods. Criminal victimization rates were twice as high among Chicago public housing tenants as in the city as a whole.

Those who used vouchers to move (often to the suburbs) unfortunately continued to face relatively high crime rates. Gautreaux suburban movers experienced violent crime rates about 5.0 times as high as the crime rate in the Chicago suburbs at that time, and those who moved within the city

faced violent crime rates about 1.5 times as high as the rest of the city. A more promising finding indicates that, many years after their initial move, the Gautreaux households tracked by Keels et al. (2005) lived in neighborhoods with violent and property crime rates very comparable with the surrounding county. These findings, paired with positive effects on education and employment for Gautreaux participants, led housing advocates to seek additional funding for similar mobility programs and helped usher in the dramatic expansion of the HCVP.

To replicate the Gautreaux study in a larger, experimental setting, HUD created MTO in 1993 as a five-city demonstration to move subsidized households from high-poverty public housing developments into low-poverty neighborhoods. The direct goal of MTO was to alleviate concentrated poverty by moving public housing residents to low-poverty neighborhoods. As with Gautreaux, despite the fact that crime was not the primary indicator of neighborhood quality that the program was designed to address, researchers reported dramatically unsafe conditions for those participating in the program. Goering, Feins, and Richardson (2002) reported that more than one-half of MTO participants identified crime, gangs, and drugs as the principal motivation for wanting to move out of their neighborhoods. Hanratty, McLanahan, and Pettit (1998) found that 11 percent of respondents reported that someone in their household had been shot or stabbed in the past 6 months, and 46 percent reported that somebody had tried to break into their home in the past 6 months. These reports of victimization were supported by administrative data. Violent crime rates for the baseline MTO census tracts in Boston, Chicago, and Los Angeles were 3.0 times higher than in the metropolitan areas as a whole (Kingsley and Pettit, 2008).

After MTO households used vouchers to move, their neighborhood crime conditions typically improved. Kingsley and Pettit (2008) found that violent crime rates in Boston, Chicago, and Los Angeles were nearly twice as high in the origin neighborhoods of the experimental MTO group as in the postmove neighborhoods. Feins and Shroder (2005) reported results of premove and postmove surveys for the MTO experimental, comparison, and control groups (the comparison group included households who received vouchers but were not restricted to using them in low-poverty neighborhoods). Survey respondents in the two groups that received vouchers reported significantly greater improvements in neighborhood safety than the control group for every question asked.[2] Thus, MTO participants were successful in using vouchers to move to safer neighborhoods.

HOPE VI program participants have also been successful at leaving dangerous public housing developments for safer environments. Popkin and Cove (2007) summarized three waves of the HOPE VI Panel Study. Baseline measures from 2001 showed that nearly 80 percent of households reported "big problems" with people using and selling drugs, two-thirds reported big problems with shootings, 23 percent reported big problems with people being attacked, and 16 percent reported big problems with rapes and sexual assault. Relocatees from public housing reported substantial declines in all these measures by 2003. By 2005, nearly all these reports were less than one-half as prevalent—35 percent of relocatees reported big problems from people using and selling drugs, and the shares of relocatees reporting big problems with shooting, attacks, and rapes and sexual

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[2] Questions addressed perceived safety during the day, safety during the night, drug activity in view in the neighborhood, and whether a household member was a crime victim in the past 6 months.

assault declined to 26, 13, and 9 percent, respectively. The evidence that HOPE VI revitalization projects are moving households to safer neighborhoods is preliminary, however, because the revitalization projects and voucher mobility HOPE VI spawned were still in progress as of the latest followup surveys in 2005.

Lens, Ellen and O'Regan (2011) conducted the only existing study of the HCVP population as a whole, rather than of specialized subsets participating in Gautreaux, MTO, and HOPE VI. Using census tract-level crime and HCVP, LIHTC, public housing, and poor renter counts from 91 U.S. cities in 2000, they found that HCVP households occupy much safer neighborhoods than LIHTC and public housing residents, face similar crime rates as the broader population of renters below the poverty line, and live in higher crime neighborhoods than the population as a whole in those cities. A surprising result from that study is the comparison between LIHTC and HCVP households in terms of crime. Although numerous studies report that LIHTC and HCVP households occupy similar neighborhoods in terms of poverty, Lens, Ellen, and O'Regan (2011) found that HCVP households occupy significantly safer neighborhoods, providing one clear advantage of tenant-based subsidies over supply-side ones.

An important mechanism to consider when examining the neighborhood crime rates experienced by subsidized households is the potential that these households can affect crime, something increasingly studied over the years. Although that mechanism is not the focus of this study, the results of these analyses have implications for how we interpret the findings in this article. For instance, if HCVP households increase neighborhood crime, then they are inherently more likely to be in higher crime neighborhoods.

Only a few studies directly test whether and how HCVP households affect neighborhood crime, although a number estimate the relationship between public housing and crime. The general consensus is that neighborhoods with traditional public housing are typically more dangerous and that public housing likely plays a role in that, but whether the existence of public housing has a dramatic effect on neighborhood crime is unclear. (Farley, 1982; McNulty and Holloway, 2000; Roncek, Bell, and Francik, 1981). Looking at scattered-site public housing, Goetz, Lam, and Heitlinger (1996) found in Minneapolis, Minnesota that such housing was associated with a reduction in police calls from before the housing was built. Galster et al. (2003) found no evidence that the creation of either dispersed public housing or supportive housing altered crime rates in Denver.

Looking at HCVP households, Suresh and Vito (2009) examined the effects of public housing demolition and the concentration of HCVP households on patterns of homicide in Louisville, Kentucky. They found that homicides initially clustered in and around public housing developments, and they clustered near Section 8 apartments after the public housing was demolished. This work is correlational, however, and relied on several cross-sections rather than longitudinal analyses. Van Zandt and Mhatre (2009) analyzed crime data within a 0.25-mile radius of apartment complexes containing 10 or more HCVP households during any month between October 2003 and July 2006 in Dallas, Texas. The police unfortunately did not collect crime data in these areas if the number of HCVP households dropped to less than 10, leading to gaps in coverage and limiting the number and type of neighborhoods examined. The authors found that clusters of HCVP households are associated with higher rates of crime; however, similar to Suresh and Vito (2009), it is unclear if this relationship was causal.

Popkin et al. (2012) looked at public housing transformation in Chicago and Atlanta and tracked the households that used vouchers to leave housing slated for demolition. They found that an influx of HCVP households to a neighborhood increased crimes in that neighborhood after a threshold of HCVP households entered the neighborhood, providing the most reliable evidence to date that HCVP households increase crime. Mast and Wilson (2013) investigated the relationship between vouchers and crime in Charlotte, North Carolina, and consistent with Popkin et al. (2012) found evidence that HCVP households with children increase neighborhood crime. Like Popkin et al. (2012), Mast and Wilson (2013) found strong evidence for threshold effects—the relationship was stronger at higher crime and voucher quartiles.

Ellen, Lens, and O'Regan (2012) used longitudinal data on 10 U.S. cities covering various years from 1997 through 2008 and estimated whether increased voucher numbers in census tracts lead to elevated crime. The authors found a strong association between vouchers and crime, but they concluded that the association appears to be largely because HCVP households tend to move to neighborhoods that are experiencing increases in crime or have high crime rates to begin with.

In sum, HCVP households live in relatively unsafe neighborhoods but occupy safer neighborhoods than those of LIHTC and public housing households. It is also possible that HCVP households affect neighborhood crime rates, suggesting the need for caution when developing policies to move HCVP households to lower crime neighborhoods. No previous work, however, identifies the city and metropolitan area housing and demographic characteristics that are most likely to grant HCVP households access to lower crime neighborhoods. Pendall (2000) addressed a similar question looking at poverty and other measures of neighborhood distress. Using tract-level data on 443 metropolitan areas in 1998, Pendall identified the proportion of an area's voucher-holding population that resides in a distressed neighborhood[3] and estimated a set of models that identified the area factors most strongly associated with the voucher population's presence in distressed neighborhoods. Pendall found that the percentage of renters in distressed neighborhoods and high rates of African-American and Hispanic households among the voucher-holding population are associated with a higher proportion of HCVP households in distressed neighborhoods. Relatively high rents in non-distressed neighborhoods and the poverty rate in the metropolitan statistical area (MSA), however, were negatively associated with voucher concentration in distressed neighborhoods. Pendall concluded that HCVP households actually avoid neighborhoods with very low rents, perhaps because of the value of their subsidies. In this article, I estimate the effects of these housing market and urban spatial variables—in addition to others—on the ability of HCVP households to reach lower crime neighborhoods.

Data and Methods

The goal of this article is to identify the city and metropolitan area spatial characteristics that contribute to the concentration of HCVP households in high-crime neighborhoods. The empirical

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[3] Following Kasarda (1993), Pendall (2000) defined a distressed neighborhood as one that is one or more standard deviations greater than the mean in each of the following: the share of residents receiving public assistance, the percentage of males ages 16 and older who worked fewer than 27 weeks in the previous year, the share of female-headed households, and the share of residents ages 16 through 19 who are not in school and lack a high school degree.

piece begins by providing descriptive statistics estimating census tract-level crime exposure for HCVP, LIHTC, and public housing households.[4] Then, I estimate a set of models to identify factors that explain differentials in crime exposure and location in high-crime tracts for HCVP households. The analysis relies heavily on the National Neighborhood Crime Study, a nationally representative sample of crime data for 9,593 census tracts in 91 U.S. cities, collected by Ruth Peterson and Lauren Krivo of Ohio State University. Peterson and Krivo (2010) began with a stratified (by region of the country) random sample from all cities with a population of at least 100,000 as of the 2000 census. Participating cities provided the authors with either address-level or tract-aggregated Part I (major) crime counts[5] in 1999, 2000, and 2001. When necessary, Krivo and Peterson aggregated the address-level data to the census tract. If a city was unwilling to send their data, the authors selected a city of similar size, racial and ethnic composition, and poverty rate as a replacement. The public-use data consist of Part I crimes summed during the entire 3 years, making the 2000 crime counts equivalent to 3-year averages. Collecting data in 3-year averages smooths out abnormal spikes during the sample period and is frequently used in crime research when possible (Sampson, Raudenbush, and Earls, 1997).

These data do have some limitations, however. First, they paint a picture of the world in 2000. There is no reason to believe the relationships between HCVP household crime exposure and the housing and demographic features of cities have changed a great deal in the years since these data were collected. The HCVP has continued to grow during that time, however, and the spatial concentration (and level) of crime in many cities has likely changed, as well. Second, I am restricted to the cities for which Krivo and Peterson collected data. These cities are all large, and most (60 percent) are central cities. It would be interesting to replicate these analyses at the MSA level to observe the effect of the recent growth of the suburban voucher-holding population on crime exposure and whether some metropolitan areas are better facilitating moves to lower crime suburban neighborhoods than others. The findings from this article should be interpreted in light of these data limitations.

Census tract-level counts for four types of households were merged to the crime data—HCVP households, renter households below the poverty line, and public housing and LIHTC households—all measured in 2000. I then merged these data to 2000 census counts of total housing units and tract-level demographic statistics.

Comparing the two samples in exhibit 2, it is clear that the 91-city sample is indeed quite similar to all U.S. cities. This sample represents more than one-third of all U.S. cities with populations greater than 100,000, and it has similar prevalence of Whites, African Americans, Hispanics, people in poverty, public housing households, HCVP households, and LIHTC households. In each sample, HCVP households represent approximately 2 percent of all housing units. Crime rates are also very similar (62.0 and 60.9 crimes per 1,000 residents) in each sample.

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[4] Some of these descriptive statistics are reprinted from Lens, Ellen, and O'Regan (2011).

[5] Part I crimes are collected as part of the Federal Bureau of Investigation's Uniform Crime Report system. These crimes comprise the violent crimes assault, sexual assault, homicide, and robbery and the property crimes larceny, burglary, motor vehicle theft, and arson.

Exhibit 2

Census Tract-Level Descriptive Statistics, 2000

	91-City Cross-Section Sample (N = 9,583 tracts, 91 cities)	All Tracts in U.S. Cities > 100,000 (N = 19,252 tracts, 250 cities)
Total population	39,426,839	106,466,565
Crimes per 1,000 people	62.0	60.9[a]
HCVP households per tract	31.8	38.4
LIHTC households per tract	22.7	24.9
Public housing households per tract	26.3	31.5
Poor renter households per tract	184.4	219.5
People per tract	4,114	5,162
Poverty rate (weighted average)	16.9%	17.1%
Percent non-Hispanic White (weighted average)	48.4%	48.0%
Percent non-Hispanic African American (weighted average)	22.5%	21.8%
Percent Hispanic (weighted average)	22.9%	22.3%

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

[a]*Of the 250 U.S. cities, 222 had crime data available.*

Estimating Crime Exposure

I construct three measures to estimate the exposure to crime for subsidized households. The first two measures are continuous measures that are equivalent to weighted averages. One is an absolute measure of crime exposure, and the other is relative to the city's crime rate. The first measure weights a tract's crime rate by the proportion of the sample's relevant household type (HCVP, LIHTC, and so on) within that tract. This measure calculates the tract crime rate experienced by the average member of the given group. This absolute crime measure uses the number of people in the tract as the denominator, expressed as crimes per 1,000 people. For HCVP households, the crime exposure rate can be expressed as—

$$\sum_{i=1}^{n}[Crime_i * (\frac{v_i}{V})], \tag{1}$$

where $Crime_i$ is the crime rate in census tract i, v_i is the number of HCVP households (or public housing, LIHTC, or poor renter households) in census tract i, and V is the number of HCVP households (or public housing or LIHTC units, or poor renter households) in the city. The resulting value is the weighted average crime rate.

To construct the second measure, wherein tract crime exposure is relative to the overall city crime rate, I take the ratio between each tract's crime rate and that of the surrounding city. That ratio replaces the crime rate in census tract i ($Crime_i$), and the resulting value for each subgroup (that is, HCVP or LIHTC households) is the weighted average of the ratio between tract and city crime rates. Looking at both relative and absolute measures of crime exposure is important. For the absolute measure, although tract crime exposure is largely driven by city crime rates, households in higher crime neighborhoods are affected in exactly the same manner. Further, the portability of vouchers across city boundaries should enable HCVP households to leave high-crime cities for lower crime neighboring jurisdictions. The relative measure, on the other hand, captures the isolation of HCVP households in the higher crime tract within cities, regardless of the crime levels in a city.

The third measure captures the percentage of each city's (and the entire sample's) housing subgroup population that resides in a high-crime neighborhood. A high-crime neighborhood is a census tract with a crime rate in the top quartile of all tracts in the sample. The top quartile threshold for the entire sample is 88 crimes per 1,000 people.

Exhibit 3 provides the crime exposure rates for the total population, for HCVP, poor renter, LIHTC, and public housing households and for LIHTC households in Qualified Census Tracts (QCTs)[6] using the two weighted average measures and the highest quartile measure. The three measures perform similarly across the five groups—HCVP households are in higher crime tracts than the total population, but poor renter, LIHTC, and public housing households, and LIHTC households in QCTs, are all in higher crime tracts than HCVP households. In all columns, each value is statistically significantly different from one another at the 1-percent level. In terms of magnitude, the simplest comparison is in the second column of data—HCVP households live in tracts 22 percent higher in crime than those in the surrounding city, and the corresponding figure is 28 percent for poor renter households, 51 percent for LIHTC households, 60 percent for public housing households, and 81 percent for LIHTC households in QCTs. The finding that HCVP households experience substantially lower neighborhood crime rates than LIHTC households differs sharply from findings in the literature regarding poverty exposure—LIHTC and HCVP households tend to locate in similarly situated neighborhoods in terms of poverty. What remains to be seen is which cities provide greater opportunities for these HCVP households to avoid living in high-crime neighborhoods and what spatial characteristics of these cities are most associated with such opportunities.

Exhibit 3

Crime Exposure Rates, 2000

Household Type	Weighted Average Crimes per 1,000 People	Tract-Based Ratio Between Weighted Average and City Crime Rates	Percent Living in High-Crime Tracts (top quartile)
All	62.0	1.00	18.3
HCVP	76.9	1.22	26.8
Poor renter	82.2	1.28	29.8
LIHTC	100.6	1.51	35.7
Public housing	108.4	1.60	42.6
LIHTC in QCTs	121.5	1.81	49.9

HCVP = Housing Choice Voucher Program. LIHTC = low-income housing tax credit. QCT = Qualified Census Tract.
Notes: All values are statistically different from the voucher value in the same column; alpha = 0.01. N = 91 cities.

Modeling the City-Level Crime Exposure of HCVP Households

Given the many cities included in the cross-section, I am able to estimate regression models that shed light on the spatial characteristics of cities associated with HCVP households' different levels of crime exposure. It is important to examine crime exposure at the city level, because that is the level at which the HCVP is often administered. Although several housing submarkets exist within a city or metropolitan area, public housing authorities operating at the city, county, or MSA level

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[6] Developers using the LIHTC receive a 30-percent bonus on their tax credit for building in QCTs, which are tracts where at least one-half of the residents earn less than 60 percent of the gross Area Median Income.

often have a lot of influence on the location of subsidized households. Simply put, very few housing policies are determined at the neighborhood level. A city's overall crime rate likely has much to do with HCVP households' crime exposure, but it is important to identify whether, controlling for city crime rates, conditions in some cities are more conducive than in others to granting HCVP households access to safer neighborhoods.

A city's voucher-holding population is more likely to be greatly exposed to crime when the total crime rate is high and when crime and HCVP households are highly concentrated—particularly if they are concentrated in the same neighborhoods within the city. Thus, the total crime rate, the concentration of HCVP households, the concentration of crime, and the interaction between HCVP household concentration and crime concentration are all likely to be highly correlated with HCVP households' crime exposure. Additional factors, however, are likely to affect the concentration of HCVP households in less desirable neighborhoods. In work on identifying the factors that lead HCVP households to live in distressed neighborhoods (high levels of male unemployment, high school dropouts, public assistance receipt, and female-headed households), Pendall (2000) hypothesized that a higher proportion of the voucher-holding population will locate in distressed tracts when it is more difficult or costly for HCVP households to locate in nondistressed neighborhoods. The same is likely true for crime. Building on Pendall's model, I include the following variables: the proportion of rental housing in high-crime (or very high-crime) tracts, the rent differential between low- and high-crime tracts as a percentage of rent in low-crime tracts (a measure of how much more rent tenants have to pay to live in low-crime neighborhoods), rent in lower crime tracts as a percentage of HUD Fair Market Rent (FMR) in 2000, the differential between the voucher-holding minority population and city minority population, the vacancy rate in lower crime neighborhoods, and the city poverty rate.

I express the model that identifies the relative importance of these effects as—

$$VouchExp_i = \alpha_i + \beta_1 Crimei + \beta_2 VouchConc_i + \beta_3 CrConc_i + W\delta_i + D\gamma_i + e_i. \tag{2}$$

In this model, a city's HCVP household crime exposure rate is regressed on the city's total crime rate, the concentration of HCVP households (measured by the voucher/nonvoucher dissimilarity index),[7] and the concentration of crime in a city (the neighborhood standard deviation divided by the neighborhood mean). I run two sets of models, one with the absolute measure of crime exposure as the dependent variable and the other with the relative (ratio between tract and city crime rates) measure as the dependent variable. In models with the relative measure as the dependent variable, I do not include the city crime rate on the right-hand side of the equation. δ_i signifies the vector of housing market variables, following Pendall (2000), listed in the previous section. I also include a vector of demographic and segregation variables (γ_i) that are likely to affect the ability of HCVP households to reach lower crime neighborhoods and a dummy variable to denote whether the city is the core city of a MSA, to differentiate between central cities and more suburban areas. In addition, I include a dummy variable that signifies whether the city's landlords were subject to

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[7] $0.5 * \sum_{i=1}^{n} = 1\frac{v_i}{V} - \frac{nv_i}{NV}$. In this version of a standard dissimilarity index, v_i is the number of vouchers in a tract, V is the number of vouchers in the city, nv_i is the number of nonvoucher households in tract i, and NV is the number of nonvoucher households in the city. I calculate this index separately for each city.

source of income (SOI) laws that prohibit them from discriminating against HCVP households. These laws should increase the number of voucher households in a city by increasing the voucher utilization rate (the proportion of HCVP households that are actively using the voucher to rent a home). Freeman (2012) found that SOI laws do in fact raise utilization rates after jurisdictions pass such laws. HCVP households in jurisdictions with SOI laws should also be less clustered in distressed neighborhoods, because landlords in high-demand neighborhoods are less likely to discriminate against them. In fact, Freeman (2012) also found that SOI laws affect HCVP household locational outcomes.

Descriptive statistics for these variables are presented in exhibits 4 and 5. Exhibit 4 contains city-level regression variables, and exhibit 5 displays characteristics of high- and low-crime census tracts. Looking at the city-level variables, we see that the average HCVP household crime exposure rate

Exhibit 4

Descriptive Statistics for City-Level Regression Variables, 2000

	Mean	Standard Deviation
HCVP households' crime exposure per 1,000 people	72.1	27.9
Total crime rate per 1,000 people	64.6	23.9
Voucher/nonvoucher dissimilarity index	0.455	0.100
Tract crime concentration	0.739	0.149
Poor/nonpoor dissimilarity index	0.320	0.059
White/non-White dissimilarity index	0.389	0.158
Population	432,278	556,237
Poverty rate	0.156	0.063
Percent African American	0.189	0.167
Median household income ($1,000s)	40.8	11.9
Vacancy rate	0.068	0.030
HCVP households per capita	0.008	0.005

HCVP = Housing Choice Voucher Program.

Exhibit 5

Characteristics of High- and Low-Crime Census Tracts

	Highest Crime Quartile (N = 2,396)	Lowest Crime Three Quartiles (N = 7,187)
Total population	7,215,897	32,210,942
People per tract	3,011.6	4,481.8
Crimes per 1,000 people*	142.8	43.9
Voucher households per tract*	44.1	36.2
LIHTC households per tract*	37.4	23.0
Public housing households per tract*	39.6	19.3
Poor renter households per tract*	274.9	201.0
Renters per tract*	1,003.7	906.0
Average rent ($)	561.35	716.0
Vacancy rate	11.7	6.1
Poverty rate	26.8	15.7
Percent non-Hispanic White	36.2	51.2
Percent non-Hispanic African American	43.3	20.9
Percent Hispanic	16.3	21.8

LIHTC = low-income housing tax credit.
*Weighted by tract population.

across cities is higher than the average total crime rate. The voucher/nonvoucher dissimilarity index is comparable with the White/non-White dissimilarity index and greater than the poor/nonpoor dissimilarity index. On average, about 46 percent of HCVP households would have to change census tracts for their spatial distribution to be equivalent to that of non-HCVP households. The coefficient of variation is about 0.74, meaning that average tract crime rates are only about 25 percent higher than the standard deviation.

Exhibit 5 shows that high- and low-crime tracts are quite different across a number of indicators. Low-crime tracts are more populous and have dramatically lower crime rates (by definition). HCVP households are slightly more likely to live in high-crime tracts than low-crime tracts, but LIHTC and public housing households are much more likely to live in high-crime tracts than all other groups. Average rents are much less in high-crime tracts, where vacancy, poverty, and minority rates are higher.

Results

Results from a set of models identifying the city characteristics associated with HCVP households' higher levels of crime exposure are presented in exhibits 6, 7, and 8. In exhibit 6, the dependent variable is the crime rate weighted by the prevalence of HCVP households in the tract. In exhibit 7, I use the relative measure that captures the ratio between tract and city crime. Exhibit 8 provides results from the models with the percentage of HCVP households in the highest crime quartile as the dependent variable. The independent variables are the same in every table except that the city crime rate is dropped from exhibit 7, because it is already controlled for in the construction of the crime exposure measure on the left-hand side of the equation. In model 1, I include only housing market variables—the rent differential between high- and low-crime tracts, average rent in lower crime tracts as a percentage of HUD FMR, percentage of renters in high-crime tracts, and vacancy rate. Model 2 adds the poverty rate, poor/nonpoor dissimilarity index, and White/non-White dissimilarity index. In model 3, I drop the dissimilarity indices in favor of racial differentials between the city and voucher-holding population (for African Americans and Hispanics separately) and add dummy variables signifying whether the city's landlords are subjected to SOI laws and whether the city is a central city in a metropolitan area. In model 4, I include all previously mentioned variables. All four models control for the region of the country. Note that in exhibits 6 and 7, the number of observations is either 89 or 87, because I drop two cities (Livonia, Michigan, and Pembroke Pines, Florida) with fewer than 100 HCVP households, and I drop two cities (Hialeah and Miami, Florida) that do not have data on the race of HCVP householders from models with the African-American and Hispanic voucher-holding and general population variables.

Some clear patterns emerge across the three exhibits. The rent differential between high- and low-crime tracts—a measure of how much more expensive it is to rent in low-crime neighborhoods—is a consistent correlate of HCVP households' crime exposure. In cities where lower crime tract rents are relatively more expensive compared with higher crime tract rents, we see that HCVP households are more exposed to neighborhood crime. It is interesting to note that these findings contrast sharply with Pendall's (2000) findings on distressed neighborhoods. His analyses concluded that HCVP households are more likely to live in nondistressed neighborhoods when rents in distressed

neighborhoods are relatively lower, suggesting that they avoid distressed neighborhoods when rents are very low (because they have a voucher to afford more rent), but this behavior is not observed for high- and low-crime tracts.

Exhibit 6

Modeling City Voucher Crime Exposure, 2000

The dependent variable is *Voucher Crime Exposure* (crime rate weighted average)

	Model 1	Model 2	Model 3	Model 4
High- and low-crime neighborhood rent differential	21.88*** (6.089)	14.70*** (5.005)	17.27*** (5.872)	13.72** (5.908)
Average rent in lower crime neighborhood as percent of FMR	16.30** (7.811)	− 4.532 (8.044)	− 8.784 (8.689)	− 4.013 (8.889)
Percent of renters in high-crime tracts	56.06 (41.54)	27.86 (35.12)	19.60 (33.85)	24.81 (31.19)
Vacancy rate in low-crime tracts	− 80.17* (42.96)	− 49.63 (38.04)	− 30.49 (48.17)	− 18.76 (46.27)
Crime concentration			5.429 (15.16)	3.213 (14.29)
Voucher dissimilarity index			27.06 (36.75)	8.726 (36.96)
Voucher and crime interaction term			− 18.97 (33.65)	− 15.47 (32.48)
Poverty rate		− 104.4*** (25.98)	− 118.7*** (35.69)	− 148.4*** (35.54)
Percent African American (voucher holders) minus percent African American (city)			4.484 (10.85)	− 6.546 (9.978)
Percent Hispanic (voucher holders) minus percent Hispanic (city)			− 5.878 (15.03)	− 24.21* (13.89)
Poor dissimilarity index		53.69*** (16.11)		67.16*** (21.38)
White/non-White dissimilarity index		6.102 (8.550)		6.220 (12.14)
SOI law dummy			1.434 (2.687)	0.127 (3.011)
Central city dummy			7.237*** (2.457)	6.022*** (2.264)
Total crime rate per 1,000 people	1.142*** (0.0762)	1.244*** (0.0844)	1.209*** (0.0805)	1.234*** (0.0793)
Constant	− 9.659 (8.403)	3.526 (11.82)	15.93 (21.11)	5.619 (20.66)
Region controls	Yes	Yes	Yes	Yes
Observations	89	89	87	87
Adjusted R-square	0.870	0.904	0.894	0.905

FMR = Fair Market Rent. SOI = source of income.

Note: Robust standard errors in parentheses.

* $p < .10$. ** $p < .05$. *** $p < .01$.

The percentage of renters in high-crime tracts is strongly related to the relative measure of HCVP households' crime exposure. This finding makes sense, because HCVP households are locating where the rental opportunities are. This finding is similar to Pendall (2000) and suggests that broader efforts to increase multifamily development and density in safer neighborhoods (reducing costs by driving up supply) could work to reduce the clustering of HCVP households in high-crime neighborhoods.

Exhibit 7

Modeling City Voucher Crime Exposure, 2000

The dependent variable is *City-Relative Voucher Crime Exposure* (crime rate weighted average)

	Model 1	Model 2	Model 3	Model 4
High- and low-crime rent neighborhood differential	0.435***	0.311**	0.403***	0.312**
	(0.158)	(0.130)	(0.148)	(0.142)
Average rent in lower crime neighborhood as percent of FMR	0.305**	– 0.0553	– 0.121	– 0.00324
	(0.124)	(0.142)	(0.142)	(0.150)
Percent renters in high-crime tracts	0.560	0.536	0.799**	0.924**
	(0.390)	(0.432)	(0.373)	(0.398)
Vacancy rate in low-crime tracts	– 1.140	– 0.406	– 0.185	0.224
	(0.694)	(0.609)	(0.732)	(0.742)
Crime concentration			0.542*	0.527*
			(0.288)	(0.293)
Voucher dissimilarity index			0.947	0.525
			(0.705)	(0.753)
Voucher and crime interaction term			– 0.928	– 0.891
			(0.668)	(0.666)
Poverty rate		– 1.782***	– 1.986***	– 2.832***
		(0.517)	(0.709)	(0.880)
Percent African American (voucher holders) minus percent African American (city)			– 0.0722	– 0.290
			(0.205)	(0.192)
Percent Hispanic (voucher holders) minus percent Hispanic (city)			– 0.223	– 0.478*
			(0.224)	(0.254)
Poor dissimilarity index		0.603*		0.876*
		(0.357)		(0.515)
White/non-White dissimilarity index		0.191		0.414
		(0.166)		(0.266)
SOI law dummy			– 0.0106	– 0.0109
			(0.0477)	(0.0507)
Central city dummy			0.0753	0.0481
			(0.0512)	(0.0492)
Constant	0.961***	1.315***	1.099**	0.902**
	(0.112)	(0.254)	(0.456)	(0.448)
Region controls	Yes	Yes	Yes	Yes
Observations	89	89	87	87
Adjusted R-squared	0.195	0.338	0.289	0.340

FMR = Fair Market Rent. SOI = source of income.

Note: Robust standard errors in parentheses.

* p < .10. ** p < .05. *** p < .01.

The vacancy rate in low-crime neighborhoods is weakly related to each of the continuous measures of crime exposure, as is the average rent in lower crime tracts as a percentage of the FMR. In exhibit 8, however, where the dependent variable is the percentage of HCVP households in high-crime tracts (the top quartile), the vacancy rate in low-crime tracts is very strongly associated with such HCVP household concentrations in high-crime tracts. Further, these results are consistent

Exhibit 8

Modeling City Voucher Crime Exposure, 2000

The dependent variable is *Percent of Voucher Households in High-Crime Tracts* (highest quartile)

	Model 1	Model 2	Model 3	Model 4
High- and low-crime rent neighborhood differential	0.189*** (0.0680)	0.182*** (0.0628)	0.172** (0.0765)	0.167** (0.0666)
Average rent in lower crime neighborhood as percent of FMR	0.0755 (0.0517)	0.0191 (0.0627)	0.0241 (0.0685)	0.0351 (0.0792)
Percent renters in high-crime tracts	1.248*** (0.104)	1.172*** (0.108)	1.199*** (0.108)	1.134*** (0.105)
Vacancy rate in low-crime tracts	– 0.836*** (0.265)	– 0.794*** (0.278)	– 0.665* (0.353)	– 0.681** (0.335)
Crime concentration			0.0229 (0.102)	– 0.000224 (0.107)
Voucher dissimilarity index			0.128 (0.322)	0.0362 (0.324)
Voucher and crime interaction term			– 0.100 (0.232)	– 0.0527 (0.247)
Poverty rate		– 0.341* (0.180)	– 0.409 (0.261)	– 0.503* (0.255)
Percent African American (voucher holders) minus percent African American (city)			0.0495 (0.0741)	0.00800 (0.0805)
Percent Hispanic (voucher holders) minus percent Hispanic (city)			– 0.111 (0.113)	– 0.187 (0.113)
Poor dissimilarity index		0.158 (0.134)		0.319* (0.177)
White/non-White dissimilarity index		0.0310 (0.0707)		– 0.0124 (0.101)
SOI law dummy			– 0.0130 (0.0221)	– 0.0215 (0.0246)
Central city dummy			0.00945 (0.0192)	0.00555 (0.0206)
Total crime rate per 1,000 people	– 0.000174 (0.000879)	0.000721 (0.000994)	0.000615 (0.000990)	0.00138 (0.00101)
Constant	– 0.0851 (0.0559)	– 0.0697 (0.0785)	– 0.0371 (0.165)	– 0.0835 (0.165)
Region controls	Yes	Yes	Yes	Yes
Observations	86	86	84	84
Adjusted R-squared	0.913	0.915	0.913	0.914

FMR = Fair Market Rent. SOI = source of income.

Note: Robust standard errors in parentheses.

* $p < .10$. ** $p < .05$. *** $p < .01$.

with those regarding the rent differential between low- and high-crime tracts and the percentage of renters in high-crime tracts. The findings for these housing market variables provide support for a common critique of the HCVP—in very tight rental markets, landlords often discriminate against HCVP households (Cunningham and Sawyer, 2005; Freeman, 2012; Fosburg, Popkin, and Locke, 1996). In these markets, supply-side efforts—or increases in the value of the HCVP subsidy—may be more effective. Public housing and LIHTC households are even more clustered in higher crime neighborhoods, however, suggesting we have yet to find ways of building subsidized housing in low-crime neighborhoods.

The most counterintuitive finding is the fact that the poverty rate has a strong, negative relationship with the crime exposure measures in exhibits 6 and 7 (and a weak relationship with the top quartile measures). The negative relationship suggests that the higher the poverty rate, the lower the voucher clustering in high-crime tracts. Thus, in cities with higher poverty rates, HCVP households are relatively less exposed to high crime levels, which could be because, in high-poverty cities, more neighborhoods are available for HCVP households to locate because rents are generally lower. Note that these correlations are quite strong—scatterplots of crime exposure and poverty rates that control for the overall crime rate suggests that the high-poverty cities clearly have relatively low crime exposure rates among HCVP households.

Income segregation—measured by the poor/nonpoor dissimilarity index—has a very strong relationship with the absolute measure of crime exposure in exhibit 6 but a weaker relationship with the relative measure and highest quartile measure in exhibits 7 and 8, respectively. The magnitude of the relationship is quite strong. On the other hand, the White/non-White dissimilarity index is not related to crime exposure. SOI laws are not at all related to crime exposure for HCVP households, suggesting that those laws are not helping HCVP households locate in lower crime neighborhoods. This finding is counter to Freeman's (2012) findings regarding voucher locational outcomes and SOI laws. A possible explanation for this finding is that very few cities (15) had SOI laws at this time, and the reason those very cities and states passed SOI laws may be because of a legacy of landlord discrimination, leading to HCVP household clustering that has persisted over time. HCVP households have greater exposure to neighborhood crime in central cities according to the absolute measure but not according to the relative measure. Relatively high rents in lower crime neighborhoods, as compared with HUD FMRs, the concentration of crime, the voucher/non-voucher dissimilarity index, the interaction between crime and HCVP household concentrations, and differentials between African-American and Hispanic proportions of HCVP households and all other households are insignificant in all models.

Conclusion and Policy Implications

Recent research on HCVP suggests that HCVP households occupy safer neighborhoods than LIHTC and public housing households. This article provides additional evidence supporting those conclusions by showing that LIHTC and public housing households live in significantly higher crime neighborhoods when controlling for the city crime rate, and they are significantly more likely to live in neighborhoods that are in the highest quartile of the distribution of census tract-level crime rates in 91 large U.S. cities. Although this achievement is important for HCVP, HCVP households

are still about 50 percent more likely to live in higher crime neighborhoods than the general population, and on average live in neighborhoods with crime rates that are more than 20 percent higher. In response to this differential, this article attempts to identify why HCVP households are clustered in higher crime neighborhoods.

Two housing market characteristics—the percentage of renters located in high-crime neighborhoods and the differential between average rents in low- and high-crime tracts (in other words, how much more expensive it is to rent in low-crime tracts)—explain much of the variation in the extent to which HCVP households cluster in high-crime neighborhoods. For the proportion of HCVP households living in high-crime neighborhoods, the vacancy rate in low-crime tracts is also an important correlate. These results suggest that tight rental markets make it difficult for HCVP households to access lower crime neighborhoods; when low-crime neighborhoods in a city have high rents and low vacancy rates, HCVP households are exposed to more crime.

In most models, the higher a city's poverty rate, the lower the crime exposure of HCVP households—suggesting that perhaps those cities have lower rents and that voucher subsidies provide those households additional purchasing power. With the exception of the poor/nonpoor dissimilarity index, which was strongly related to greater crime exposure for HCVP households, a number of segregation and demographic characteristics were weak predictors of crime exposure for HCVP households.

Given that the bulk of the findings stress that tight rental markets (particularly in low-crime neighborhoods) are bad for HCVP household neighborhood safety, a sensible solution is to expand the stock of affordable housing in such markets. Despite the fact that supply-side efforts to expand the affordable housing stock—chiefly the LIHTC—have been documented to locate households in even higher crime neighborhoods, such development could be intentionally in lower crime neighborhoods. In addition, zoning restrictions should be relaxed, given the fact that rental housing stock is often scarce in low-crime neighborhoods because cities often exclude multifamily housing from such neighborhoods. If some of these regulations are removed, it may spur multifamily development in safer neighborhoods that a wide array of families—with or without vouchers—can afford.

These findings also suggest possible alterations to HCVP. First, an increase in the value of the voucher subsidy—perhaps through raising the FMR or allowing for additional subsidies in lower crime neighborhoods—should reduce the likelihood that HCVP households will locate in high-crime neighborhoods. Of the housing variables, the strongest correlate with HCVP households' crime exposure is the rent differential between high- and low-crime neighborhoods. High- and low-crime neighborhoods are always going to have disparate average rents, meaning HCVP households require generous subsidies to enable them to reach lower crime neighborhoods.

Mobility counseling is another underfunded and underused potential way to reduce the exposure of HCVP households to neighborhood crime. HCVP and other low-income households have many reasons to tend to congregate in high-crime neighborhoods, but one is likely a lack of information about housing opportunities in other locations. Cunningham and Sawyer (2005) documented the efforts of the Housing Opportunity Program in Chicago. HCVP households that received mobility counseling were twice as likely to locate in low-poverty neighborhoods as those that did not receive such counseling. Housing authorities require funding to replicate these efforts with the goal of helping households avoid higher crime neighborhoods.

Acknowledgments

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