

Cityscape

*A Journal of Policy
Development and Research*

RENTAL ASSISTANCE AND CRIME
VOLUME 15, NUMBER 3 • 2013



PD&R



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

Note: The shutdown of the federal government from October 1 through October 16, 2013, delayed the production of this issue of Cityscape.

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Cityscape is published three times a year by the Office of Policy Development and Research (PD&R) of the U.S. Department of Housing and Urban Development (HUD). Subscriptions are available at no charge and single copies at a nominal fee. The journal is also available on line at <http://www.huduser.org/periodicals/cityscape.html>.

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Housing Programs, Assisted Populations, and Crime: Guest Editors' Introduction

Ron Wilson

Brent D. Mast

U.S. Department of Housing and Urban Development

The views expressed in this guest editors' introduction are those of the authors and do not represent the official positions or policies of the U.S. Department of Housing and Urban Development (HUD). The views and recommendations expressed in the symposium articles are those of the authors and are not necessarily endorsed or supported by the guest editors or HUD.

Introduction

This symposium features rigorous research that objectively examines the relationship between assisted housing populations and crime. We use this symposium to identify and acknowledge the negative findings to more precisely identify their root causes and recommend appropriate policy responses. We also highlight the many positive findings regarding the effect of housing programs on assisted populations and their connection to crime problems. We particularly focus on how housing and criminal justice agencies can work together for a more unified approach to solving the problems assisted populations and their communities face. We hope the research in this symposium prompts more future research efforts to consider integrating knowledge from both criminal justice and housing research toward refining housing programs and policies to improve the quality of life with housing as a platform.

The articles presented in this symposium are a dichotomy of individual and neighborhood issues. The first three articles highlight crime issues related to individuals and families for whom program policies make it more difficult to obtain assisted housing. Two main themes are present in these articles. First, the articles show that assisted populations face a series of barriers—perceived or actual—regarding their involvement with crime that prevent them from taking full advantage of housing assistance. Second, the articles demonstrate that little research exists that tests the effect of housing as a platform to help those who have in one way or another been exposed to crime or are involved with the criminal justice system.

The latter three articles highlight the intersection of people and place, in which place of origin may transmit the message that the family moving in is an unwanted neighbor. Two main themes

also emerge from these articles. First, publicly assisted families carry a stigma of being undesirable people who will likely cause problems, which create barriers to successful relocation. Second, even when families have the opportunity to relocate, they can have difficulty finding better neighborhoods, particularly when trying to find safer places to live.

Several criminological concepts are manifest across all these articles that may be unfamiliar to *Cityscape* readers. Criminology provides more than 30 years of research that can contribute to improving the understanding of crime and neighborhoods regarding the problems assisted households encounter. We highlight key research from criminology and criminal justice associated with each article that *Cityscape* readers may want to review in thinking about future studies or crafting policies related to housing programs.

People—Program Barriers From Previous Actions

A common perception is that, when assisted families relocate to new neighborhoods, they may bring crime with them (Bovard, 2011; Rosin, 2008). Assisted tenants or their social networks may be perceived as predators who will “invade” a neighborhood, taking advantage of new opportunities to commit crimes. Much media attention has focused on the possible criminality of assisted tenants. Rarely, though, have the media or researchers focused on the degree to which assisted tenants are crime victims. In their article, Christopher Hayes, Graham McDonald, Susan Popkin, Leah Hendey, and Allison Stolte examine the question of how often assisted housing recipients are arrested for crimes and how often they are crime victims. The authors find that voucher households have higher arrest and victimization rates than the general population. This finding raises questions about the extent to which rising crime rates are because relocatee household members are being victimized as opposed to someone in the household committing crimes. Our own ongoing research on Charlotte, North Carolina—in which we are matching the addresses of voucher households with those from arrest and incident data to examine what members of voucher households are being arrested for and what incidents are occurring at their homes—is consistent with these results.¹ Hayes et al. find that older voucher holders are more likely to be victims, and younger voucher household members are more likely to be arrested. Descriptive findings from our preliminary results reveal that, of the voucher households in which an arrest occurred, most arrests are for a violation of a state statute,² some form of assault, or drugs. These findings agree with findings from previous criminological studies on social disorganization (Shaw and McKay, 1942), social cohesion (Albert, 1953), routine activities (Cohen and Felson, 1979), collective efficacy (Sampson, Raudenbush, and Earls, 1997), and social networks (Browning, Feinburg, and Dietz, 2004) that would inform housing programs about what changing demographics and resident interactions help to thwart crime.

¹ Our work was not yet complete at the time of this writing, but results will be available on request.

² Violations of a state statute in North Carolina include restraining order, bench warrant, parole, or probation violations or any other limiting requirement as levied by the court system.

Another crime-related issue with those seeking housing assistance is that many households often include someone who has been involved in the criminal justice system and are seeking housing to help rebuild their lives. Although subject to HUD regulations and guidance, local public housing authorities (PHAs) have discretion to set standards and protocols for denying or accepting applicants. It is unclear, however, how much variation exists among PHAs. Marah A. Curtis, Sarah Garlington, and Lisa S. Schottenfeld provide valuable insight into this variation by systematically examining local PHAs' exclusionary policies for people with criminal or substance abuse histories. The authors find that HUD guidelines lead many PHAs to set a wide range of standards that lead to more stringent denial or expulsion criteria. The outcome of this research is beneficial to inform HUD, because no systematic analysis has previously examined the variation in exclusionary policies. Data on policy variation provide an opportunity for a broader evaluation of the effect of housing as a platform for successfully integrating ex-offenders. Such research could lead to more consistent optimal policies for helping ex-offenders in any locality obtain housing. Life-course and desistance research (Laub and Sampson, 2003; Piquero et al., 2001; Seinnick and Osgood, 2008) from criminology might prove useful in helping PHAs craft more refined policies toward determining which ex-offenders should be considered for assistance.

Finding employment, obtaining educational training, and participating in rehabilitation programs are critical to reducing recidivism, but the role of housing has been evaluated to a much lesser degree. Jocelyn Fontaine helps fill that gap by examining the effect of a reentry housing program in Ohio on reducing reoffending. Under quasi-experimental conditions, her research provides evidence that supportive housing can significantly reduce reoffending by certain types of ex-offenders after they are released from incarceration. Ample research on supportive housing for people with other social problems, such as mental health disabilities, substance abuse, or other disruptive behavior; for people with physical disabilities; and for foster children aging out of the system shows that stable housing can help improve their lives (Culhane, Metraux, and Hadely, 2002; Fontaine and Beiss, 2012; Leonard et al., 2005; Pearson, Montgomery, and Locke, 2009). The Serious and Violent Offender Reentry Initiative, or SAVORI—a large and comprehensive reentry program evaluation—most recently provided a wealth of findings about what works in helping ex-offenders reintegrate into society that would be informative in integrating housing policies with criminal justice programs (Lattimore et al., 2012). Fontaine's research also demonstrates the potential benefit of collaboration between housing and criminal justice agencies.

Place—Neighborhood Reputation and Assisted Populations

The association of crime with assisted housing populations stems from a fear people have about people who reside in places known to have pervasive social problems (Andersson and Musterd, 2005; Blokland, 2008; Dean and Hastings, 2000; Fraser, 1996; Freeman and Botein, 2002; Kasinitz and Rosenberg, 1996; Keene and Padilla, 2010; Permentier, van Ham, and Bolt, 2008; Robertson, Smyth, and McIntosh, 2008). As residents relocate from distressed neighborhoods, long-time residents of the receiving neighborhoods may manifest anticipated fears that their neighborhood will decline and that they will soon become victims of crime (Garofolo, 1981). This fear has real consequences for relocatees' ability to obtain housing, because assisted populations may feel stigmatized by potential landlords and neighbors, making it difficult to find places to rent (Locke et al., 2006).

A perception exists that people receiving housing assistance are undesirable—that is, they make potentially bad neighbors who have dreadful habits, lack in self-control, are disrespectful, and do not share common social norms (Freeman and Botein, 2002; Williamson, 1974). Much of this perception stems from errant media analyses that reinforce negative stereotypes about people from troubled neighborhoods in general that extend to assisted populations living in those same places. The place stigma that transfers to assisted families makes using housing assistance as a platform for improving opportunities more difficult. In her article, Ann Owens directly examines the perceptions of safety in neighborhoods after changes occur from either the demolition of distressed public housing complexes or the relocation of voucher holders. She finds no increased perception of disorder with the presence of voucher holders individually but that if voucher holders concentrate, the perception of disorder is heightened. This finding dovetails with other recent research that has found that, when voucher holders relocate to neighborhoods with minimal to moderate concentrations of other assisted households, crime does not increase (Mast and Wilson, 2013; Popkin et al., 2012). Owens addresses another important finding—that the demolition of public housing complexes reduces perceptions of disorder and that the physical improvements from the reconstruction of HOPE VI sites lead to perceptions of increased safety. Owens' work highlights the importance of "place" to assisted populations and suggests polices to help shed stigmas associated with the receipt of housing assistance. Recent research on disorder and fear of crime could help reveal the mechanisms about "place" that trigger concerns for personal safety (Gaine, Alper, and Chappell, 2010; Schultz and Tobanico, 2009).

David P. Varady, Xinhao Wang, Dugan Murphy, and Andrew Stahlke examine several perception issues about voucher holders bringing social problems to the neighborhoods in which they relocate. Overall, the authors find that "crime turned out to be less of a problem than expected." The perceptions of respondents, however, were that, when voucher holders concentrated, problems emerged. One of their important findings was that, while local PHAs may feel obligated to voucher holders, they may not feel as responsible to the community where these families reside. Voucher holders are part of their communities, and perceptions of them make a difference regarding their chances of success. PHAs, accordingly, might better serve assisted households and their neighbors by playing a more active role in helping assisted tenants better connect with other neighborhood residents and social networks in their new environments. Research by Churchill et al. (2001) showed that, when the PHAs work with police and community organizations, voucher holders have an easier time integrating into their neighborhoods, building relationships, and fostering residential stability.

In his article, Michael C. Lens examines where voucher holders relocate to determine if they move to safer neighborhoods than those of their previous residences. He finds that voucher holders do, in fact, move to safer neighborhoods, but they move to places where crime rates are on the rise. Lens further points out that segregation and demographics have little ability to explain crime exposure and that tight rental markets keep voucher holders from moving to the best neighborhood possible. Lens points out, however, the scarcity of studies that help us understand why voucher holders move where they do. Wilson and Mast (2013) examined several research studies and found that crime was one of the most important factors motivating voucher holders to relocate to other neighborhoods. Further research is needed, however, to explore the complex relocation decisions of households receiving housing assistance. Although much research has examined residential satisfaction and geographic mobility in the general population, little research has focused

on decisions of assisted housing populations. These findings share common ground with the broken windows (Wilson and Kelling, 1982) and social networks (Browning, Feinburg, and Dietz, 2004) theories from criminology.

Moving Forward

To move forward in using housing assistance as a platform for improving family opportunities and communities as a whole, we need to refine our understanding of the interaction among housing assistance programs, the assisted families, and their neighborhoods. The articles in this symposium have clear and direct implications for housing policies, particularly in conjunction with criminal justice programs and policing strategies. Criminal justice services and housing programs have similar objectives: to help specific populations successfully integrate into their neighborhoods, reduce conflict, and improve the quality of their lives. Assisted families face many challenges beyond housing status, such as family disruption, social conflicts, substance abuse, and criminality, in which coordinating with the criminal justice system seems a reasonable way forward. These problems can form a recursive loop, perpetuating cycles of social problems for assisted tenants and their children. We hope this research provides policy guidance for improving the life chances of assisted populations, particularly the children of these populations.

Acknowledgments

All the articles included in this symposium were peer reviewed using a double-blind process, with at least two reviewers, to ensure the highest quality and integrity of the research. All the authors were required to address the reviewers' comments before final acceptance. We thank the anonymous reviewers for their comments in helping to make the included articles of the highest possible quality.

Guest Editors

Ron Wilson is a social science analyst in the Office of Policy Development and Research at the U.S. Department of Housing and Urban Development and is an adjunct faculty member of the Masters in Professional Studies in Geographic Information Systems program at the University of Maryland, Baltimore County.

Brent D. Mast is a social science analyst in the Office of Policy Development and Research at the U.S. Department of Housing and Urban Development.

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Additional Reading

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Public Housing Transformation and Crime: Are Relocates More Likely To Be Offenders or Victims?

Christopher Hayes
Graham MacDonald
Susan Popkin
Leah Hendey
Allison Stolte
Urban Institute

Abstract

Our previous research about the effect of public housing transformation on crime patterns in the neighborhoods receiving households that moved with vouchers from public housing was based on modeling the relationships among the measurable factors in all neighborhoods. Our model indicated an increase in crime rates is associated with relocated voucher holders under certain conditions, but this finding does not give us any information about the nature of the effect. Critics of relocation are concerned that offenders are moving into the neighborhoods using vouchers, but voucher holders may also be more likely to be victims in their new neighborhoods. Developing sound policy on the basis of our research clearly requires a better understanding of why crime and relocation appear to be connected. This project conducted an intensive case study of crime in a few census tracts in a single year to find out if, in those neighborhoods, voucher holders relocated from public housing have a specific connection to arrests or incident reports and, if so, whether we can draw any conclusions about how relocates affect crime.

We found that, although definitively linking crime data to specific households is challenging and could not be accomplished with complete confidence, Chicago Housing Authority voucher relocates in our selected tracts were more likely to be linked to both arrests and incidents of violent and property crimes than the population in general. That is, although the strength of the connection varied from tract to tract, people associated with relocated households were more likely to be both a victim and an alleged perpetrator than the general population. This effect was more pronounced for violent crime than property crime. We also found that older voucher holders were more likely to be victims of crime than the general population, whereas juveniles and young adults were more likely to be alleged perpetrators. These findings support the conclusions of our earlier study, further emphasize the need for greater services and supports for relocated households, and can help inform policy directed at breaking the association between these households and neighborhood crime rates.

Introduction

During the past two decades, housing assistance in the United States has undergone a profound transformation. The overarching goal behind this effort was to mitigate the economic segregation that had emerged from a long history of building public housing in racially and economically segregated areas. To do so, the federal government sought to promote strategies that would help low-income families move to areas that could provide greater social and economic opportunity (Turner, Popkin, and Rawlings, 2009). Under the \$6 billion HOPE VI program, hundreds of distressed inner-city public housing developments were demolished. These units were either replaced with new mixed-income developments or “vouchered out,” a process whereby units previously available through public housing are replaced by those available with housing choice (Section 8) vouchers. As a result, tenant-based vouchers are now the most common subsidized housing delivery system in the country, with more than 2.1 million vouchers in use in 2009, a 100-percent increase since the mid-1980s (JCHS, 2011).

Much research has documented the negative consequences of concentrated poverty and disadvantage, including poor physical and mental health, exposure to crime and violence, lack of access to quality schools and public services, high rates of disconnection from the labor market, and dependence on public assistance (Galster, 2002; Hsieh and Pugh, 1993; Krivo and Peterson, 1996; Sampson, 2011; Turner, Popkin, and Rawlings, 2009). The costs for children are profound; children who grow up in segregated, high-poverty areas are at great risk for poor outcomes including low academic achievement, poor health, and involvement in risky behavior and delinquency (Case and Katz 1991; Krivo and Peterson 1996; Popkin, Leventhal, and Weissman, 2010). Thus, the impetus behind the shift to mobility and deconcentration strategies is that very low-income public housing residents will benefit both socially and economically from living in more diverse, higher opportunity neighborhoods (Joseph, Chaskin, and Webber, 2007). Evidence from two major studies of relocated residents—the five-site HOPE VI Panel Study and the Moving to Opportunity demonstration—shows that these efforts have helped former public housing residents move to better housing in safer neighborhoods, but that they have not affected employment or educational outcomes for adults or youth (Briggs, Popkin, and Goering, 2010; Popkin, Levy, and Buron, 2009).

Further, although many former residents are better off than they were in public housing, the shift to vouchers has brought new challenges. Learning to navigate the private market with a voucher is often difficult; voucher holders may encounter problems including lack of transportation to search for units, discriminatory or unscrupulous landlords, tenant screenings and credit checks, and a shortage of large units (Buron, Levy, and Gallagher, 2007). As a result of these barriers (along with resident preferences, social networks, and their own reluctance to move to unfamiliar areas), public housing residents often relocate to high-poverty areas, frequently settling in neighborhoods near their former housing developments (Oakley and Burchfield, 2009; Popkin and Cunningham, 2000).

Although voucher holders may feel safer in the new neighborhoods, these neighborhoods are generally still poor and racially segregated, and relocating does not appear to help residents overcome personal and structural barriers to better employment, earnings, health, or educational outcomes (Briggs, Popkin, and Goering, 2010; Popkin, Levy, and Buron, 2009; Popkin et al., 2013).

Although no clear evidence suggests that public housing demolition and relocation have actually caused negative effects for receiving communities, considerable public and political opposition to racial and economic integration through mobility programs has emerged, and the voucher program is frequently cited as the cause of increases in crime. In a multisite review, Abt Associates (Churchill, Holin, Khadduri and Turnham, 2001) found widespread community opposition to voucher holders. In some instances, they identified a specific catalyst. In Fairfax County, Virginia, residents expressed concern that an influx of immigrant populations was negatively affecting school performance metrics and increasing the number of special needs students in the school system. In a similar instance, in Montgomery County, Pennsylvania, initial opposition began when a superintendent cited the voucher program as the cause of high special education costs. Overall, residents expressed the view that the voucher program resulted in four types of negative outcomes.

- Increases in social disorder, crime levels, and drug trafficking.
- Greater stress on public services.
- Falling property prices and an increase in vacant or rental properties.
- An overall neighborhood decline that would lead to an even greater influx of low-income residents.

In 2008, a very controversial *Atlantic Monthly* article, “American Murder Mystery,” reignited the debate surrounding public housing demolition, tenant relocation, and crime. The article relied on a simplistic, pictorial analysis associating crime trends with the movement of housing choice voucher recipients, making the argument that HOPE VI relocation and the voucher program were responsible for increasing crime in previously safe, moderate-income Memphis communities (Rosin, 2008). Housing researchers responded forcefully, highlighting evidence on the benefits of the voucher program for low-income families and calling into question on methodological grounds the article’s claim that the arrival of voucher recipients caused crime to increase (Briggs and Dreier, 2008).

More rigorous research recently has investigated the link between voucher holders and crime. In a 12-year study of 10 major U.S. cities, the Furman Center for Real Estate and Urban Policy found no evidence that an increase of voucher holders in a community leads to increases in crime. In fact, they found the causal ordering to be reversed: voucher holders enter neighborhoods immediately after significant crime increases (Ellen, Lens, and O’Regan, 2012). Indeed, it is plausible that with increases in crime, housing rents decline, making them more economically accessible for voucher holders.¹

Public Housing Transformation in Chicago

Nowhere have these issues surrounding public housing relocation been more prominent than in Chicago, which has historically been the country’s housing policy bellwether. Since the Plan for Transformation began in 1999, the Chicago Housing Authority (CHA) has been striving to replace its highrise developments with new, mixed-income housing that reflects the current thinking on how to provide affordable housing without creating concentrations of poverty (Popkin et al., 2004).

¹ Some material in this report was published previously in *Cityscape* (Popkin et al., 2012b).

Chicago’s experience offers important lessons for understanding the broader effect of public housing revitalization around the nation. The city has undertaken the greatest citywide transformation of public housing in the United States. Only a handful of cities—Atlanta, San Francisco, and Washington, D.C.—have plans for citywide redevelopment, and none of these plans is on as large a scale as the CHA’s Plan for Transformation. In only 10 years, Chicago has gone from being the national symbol of the failures of federal public housing to a leader in relocation services, tracking, and mixed-income housing development (Popkin, 2010; Popkin et al., 2013).

By 2011, the CHA had either built or rehabilitated more than 80 percent of the 25,000 planned units. As exhibit 1 shows, approximately one-fourth of the 16,500 families who were residing in family housing or scattered sites in 1999 have moved to the private market with vouchers (CHA, 2011). The rest of the families are in rehabilitated public housing or mixed-income developments.

Research from two longitudinal studies of relocatees, the Chicago Panel Study and the Chicago Family Case Management Demonstration, shows that these residents are living in less poor, safer neighborhoods than where they began (Popkin et al., 2013). Our analysis of the CHA’s full relocation database confirms this finding. As exhibit 2 shows, however, the realities of rental markets, discrimination, voucher program rules, and residents’ own preferences have meant that, by far, most CHA relocatees have moved to neighborhoods on the city’s South and West Sides that, although less distressed than the communities from which they moved, are still predominantly poor and racially segregated.

Although considerable research has explored how CHA’s Plan for Transformation has affected its residents, until recently less work has focused on how the influx of new voucher holders has affected receiving communities. According to one study, approximately one-half of the gangs operating in CHA developments successfully penetrated private-market communities after relocation, either by taking over existing gangs or by establishing partnerships (Venkatesh et al., 2004). Ample anecdotal evidence suggests that community residents are concerned. In the mid-1990s, a group of residents opposed the siting of subsidized housing in the North Kenwood-Oakland neighborhood on the grounds that it would be an economic detriment to the community and would further racial segregation (Pattillo, 2007). In a more recent anecdote, an article in the *New York Times* highlighted the widely held perception that tearing down projects resulted in an influx of public housing residents

Exhibit 1

Disposition of Households in 2010 That Were in Public Housing at the Start of the Plan for Transformation

Disposition	Number	Percent
Vouchers	4,097	24.3
Mixed-income developments	1,896	11.3
Rehabilitated public housing	3,395	20.2
Evicted from CHA	1,488	8.8
Deceased	1,221	7.2
Number unassisted*	4,707	28.0
Total	16,846	100.0

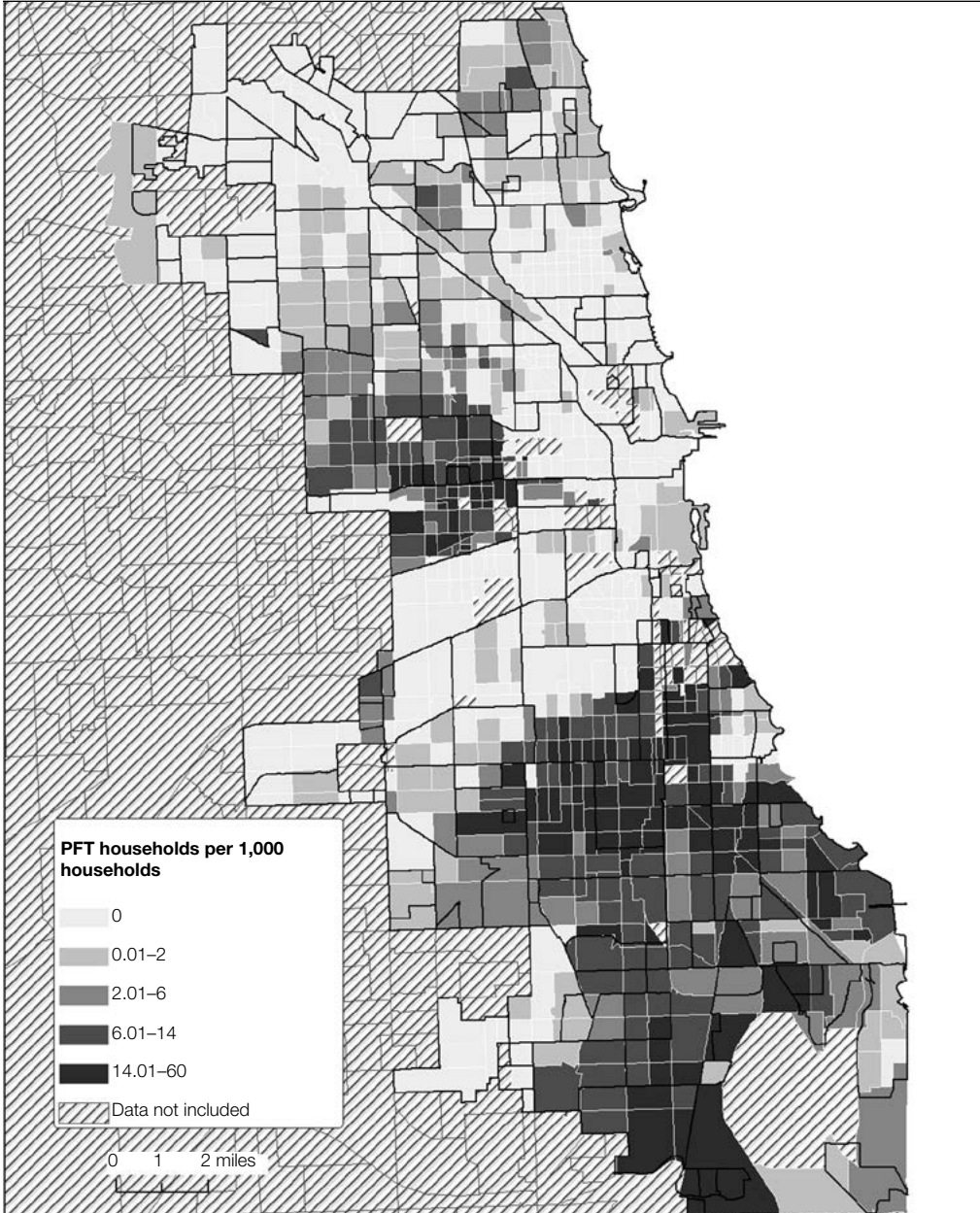
CHA = Chicago Housing Authority.

* Of the unassisted households, 1,307 left after making a permanent housing choice and satisfying their right of return.

Source: CHA, 2011

Exhibit 2

Distribution of Plan for Transformation Relocatee Households, by Census Tract, in Chicago, in 2008



PFT = Plan for Transformation.

Source: Urban Institute analysis of U.S. Department of Housing and Urban Development Form 50058 data provided by the Chicago Housing Authority

who brought crime with them to the South Side neighborhood of Chatham. This article also stresses, however, that neighborhood perceptions are not necessarily accurate—Chatham has been in decline for many years (Dumke, 2011).

As in most American cities, crime has dropped considerably in Chicago in the new millennium. Between 1999 and 2008, violent crime declined 20 percent and property crime declined 27 percent. Indeed, crime during this period declined even in the community areas² that have received the most relocatees: Auburn, Chatham, and South Shore. Skogan's (2007) analysis of Chicago's crime decline posited that the citywide crime drop is because of a combination of law enforcement and community policing factors, not the Plan for Transformation, although he did note that crime declined drastically in areas where public housing was demolished. Skogan did not explore, however, the degree to which the crime rates were higher—or lower—in certain neighborhoods than they would have been if no entrants had arrived from public housing.

These ambiguities reveal the complexity of properly addressing the extent to which relocatees cause an increase in crime when they move into new neighborhoods. A number of neighborhood characteristics—the layout of streets, alleys, and buildings; access to mass transit; and the presence and design of public spaces and facilities, for example—likely affect both the number of relocatees who will move to a community and the crime rate. Further, although it is possible that relocatees increase crime, it is even more likely that a neighborhood where crime rates are already rising will be characterized by falling property values and rents, higher vacancy rates, and, as a result, intensified efforts by landlords to recruit voucher holders to fill their units. In short, the question remains, which came first: the crime or the voucher holders?

Our previous research explored the relationship between crime and relocation from public housing using advanced modeling techniques, finding that a connection in fact exists between relocated public housing residents and crime rates under certain conditions (Popkin et al., 2012a). We found that relocatees were associated with higher than expected crime rates when the number of relocatee households exceeded two per thousand households in the neighborhood, and the effect increased at greater concentrations. This research expands on that work, through a more detailed examination of arrest and incident reports in selected tracts in Chicago, to better understand the nature of that connection. We link crime report data to voucher addresses and compare the rates at which members of voucher households are victimized or are alleged perpetrators with the rates for the population of the neighborhood; the differences provide indications of why increased concentrations of voucher households are associated with changes in crime rates.

Selected Tract Analysis

Although our previous model contributes significantly to understanding whether and how relocatees from public housing affect crime rates in receiving communities, it does not attempt to understand the dynamics of this relationship; that is, why these neighborhoods with greater concentrations of relocated households experience higher crime rates. This article extends our previous work by

² Chicago's community areas are multitract neighborhood designations used by the city government for planning purposes. The city has 77 community areas and more than 800 census tracts.

examining selected tracts in four of Chicago’s community areas. In each census tract, we use 2008 police data to connect specific individuals associated with voucher households to reported victims of crime incidents and to arrests to improve our understanding of the nature of the association between crime rates and Plan for Transformation relocatees in these neighborhoods. Our research does not attempt to establish that crime rates are higher than expected for relocatee households but is intended to uncover the details of the linkages between crime and relocatees to help explain the effect on crime rates found in our model. Although we do not conduct a causal analysis of the patterns of this association, and therefore do not draw conclusions generalizable citywide, the details of these specific cases provide important context for our previous research.

Selected Tracts

Because matching addresses from multiple sources of administrative data is a labor-intensive process, we concentrated on a few tracts in a single year (2008), the final year of the period studied in our previous research. By 2008, many former public housing residents had relocated with vouchers, and therefore we are more likely to find concentrations of relocated voucher holders at the higher levels our previous research found were associated with increased crime. For this deeper exploration, we selected 12 tracts in four Chicago neighborhoods—Englewood, Lawndale, West Garfield Park, and West Ridge. We chose these neighborhoods because they were among the most common destinations for relocatees and are dispersed across the city: Englewood is on the South Side, Lawndale and West Garfield Park are on the West Side but separated by Interstate 290, and West Ridge is a relatively more affluent community on the North Side. To ensure that we examined a wide variety of receiving neighborhoods, we chose tracts that met different thresholds based on the number of relocated voucher households per 1,000 households in 2008. We set the thresholds to correspond with those used in Popkin et al. (2012b, excluding tracts with no relocated voucher households—0.01 to 2, 2.01 to 6, 6.01 to 14, and 14.01 or more relocated voucher households per thousand—as shown in exhibit 3 (see the map in exhibit 4 for reference).

Exhibit 3

Thresholds by Tract: Relocated Households per 1,000, in 2008

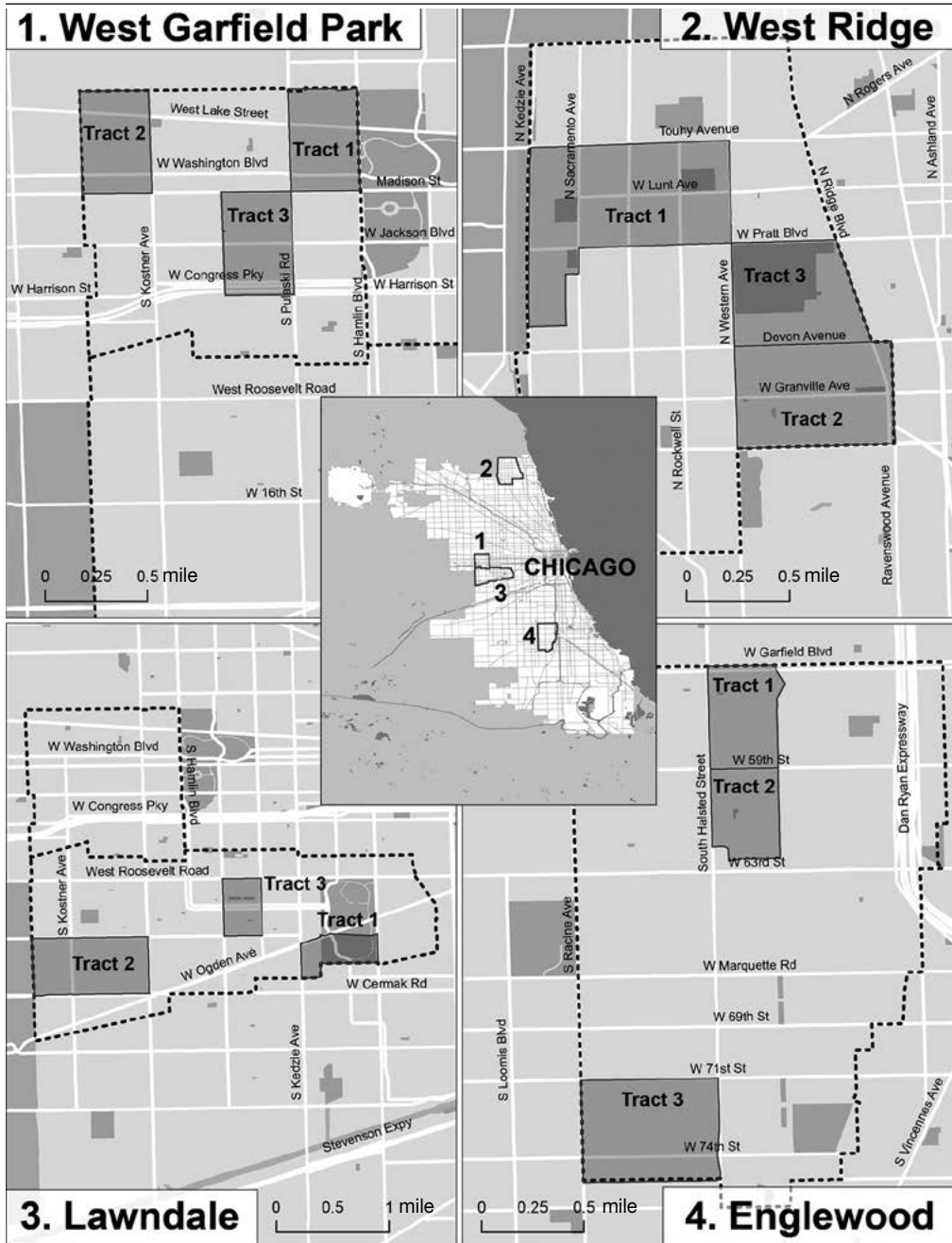
Community Area	Tract 1	Tract 2	Tract 3
West Ridge	0.01–2	2.01–6	6.01–14
West Garfield Park	2.01–6	6.01–14	14.01 +
Lawndale	2.01–6	6.01–14	14.01 +
Englewood	6.01–14	6.01–14	14.01 +

Source: Urban Institute analysis of 2000 and 2010 censuses and 2008 Chicago Police Department administrative data

Whereas the selected tracts in three of the four neighborhoods—Englewood, Lawndale, and West Garfield Park—were similar in crime rates and many demographic characteristics, the selected tracts in West Ridge differed significantly. Compared with both the city and tracts in the other community areas in this study, these communities tended to have fewer relocatees and voucher holders in general, lower poverty rates, and lower crime rates, as shown in exhibit 5. Selected tracts in Englewood, Lawndale, and West Garfield Park had more public housing relocatees and voucher holders in general, higher poverty rates, and moderate to high crime rates during our period of analysis.

Exhibit 4

Map of Selected Census Tracts



Note: Dotted lines indicate community area boundaries.

Exhibit 5

Aggregated Statistics for Selected Tracts, in 2008 (unless otherwise noted)

	Community Area				
	West Ridge	West Garfield Park	Lawn-dale	Engle-wood	Chicago
Total households	9,110	1,667	2,411	1,610	1,025,220
Percent renter households	48	76	68	56	55
Poverty rate (households) (2005–09)	15	53	37	39	18
Relocated households per 1,000 households	3	11	11	19	4
All other voucher households per 1,000 households	22	65	51	83	27
Median violent crime rate per 1,000 people	1	9	9	9	3
Median property crime rate per 1,000 people	7	21	15	19	12

Source: Urban Institute analysis of 2000 and 2010 censuses, 2005–09 American Community Survey, and 2008 Chicago Police Department administrative data

Characteristics of Relocated Households

Overall, in 2008, 471 people lived in 131 relocated households in the 12 tracts selected for this study, an average household size of 3.6 people per household. Of those households, nearly all were headed by a female and most—about 53 percent—were headed by one adult. Relocated voucher households with one adult tended to have more children (2.1) per household than relocated households with two adults (1.6 children per household), although voucher households with two adults tended to have more people (3.6) per household overall than those with only one adult (3.1 people per household). Only 28 percent of households contained exactly two adult members, and most of these households consisted of one older adult (the voucher holder) and one young adult. The population residing in relocated households consisted mostly of children and young adults, with very few older adults present (exhibit 6).

Exhibit 6

Voucher Household Characteristics for Selected Tracts, in 2008

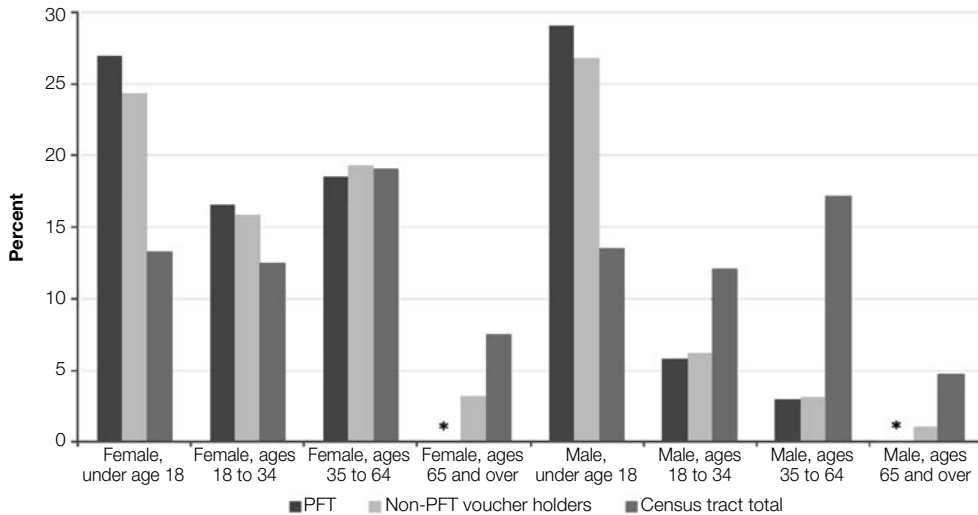
	Percent of Population in Voucher Households
Children ages 9 and younger	18
Children ages 10 to 17	34
Young adults ages 18 to 34	25
Older adults ages 35 to 64	21
Seniors ages 65 and older	< 2

Source: Urban Institute analysis of U.S. Department of Housing Urban Development Form 50058 data provided by the Chicago Housing Authority

The population in relocated households was similar demographically to that of other voucher holders who relocated to the same census tracts but was very different from the general population. People in relocated households and other voucher holders were much more likely than the general population to be children and less likely to be older adults, with a fairly even distribution between males and females (exhibit 7). Although the population in both sets of voucher households contained a greater proportion of young females and about the same proportion of middle-aged females, they were dramatically less likely to contain young and middle-aged men. Although we cannot display data by race because of small cell sizes, the heads of households of both sets of voucher households were substantially more likely to be African American than the general population.

Exhibit 7

Population by Gender and Age for 12 Selected Census Tracts, in 2008



PFT = Plan for Transformation.

* Data for people in PFT voucher households suppressed for this category because of small cell sizes.

Source: Urban Institute analysis of data from the Chicago Police Department, the Chicago Housing Authority, and the U.S. Census Bureau

Methods

For this analysis, we use 2008 Chicago Police Department (CPD) administrative data, made available to us by the CPD for this research, which provides reported crimes and arrests made by CPD officers;³ 2008 U.S. Department of Housing and Urban Development Form 50058 administrative records from the CHA, which provide information for voucher holders; and 2000 and 2010 decennial census data and 2005–09 5-year American Community Survey data, which provide population data and general descriptive statistics (see the appendix for more information). We do not look at relocated households that did not use vouchers, nor do we look at voucher households other than those relocated from public housing under the Plan for Transformation.

Working with these data, we matched the addresses of relocated voucher holders to incident reports and arrest records for the period in 2008 during which they lived in 1 of the 12 selected tracts. We defined people appearing in incident reports as targets of crime, indicating victimization, and we considered arrestees to be alleged perpetrators of crimes. We divided the total arrests and incident reports associated with relocated voucher households by the total population in those voucher households, and compared the resulting rates with the number of crimes per person in the tract to determine whether people associated with voucher households are more or less likely than the

³ Although we examined all crimes regardless of classification, our analysis here refers chiefly to part 1 violent and property crimes. Part 1 violent crime includes aggravated assault, forcible rape, murder, and robbery, and part 1 property crime includes arson, burglary, larceny, and motor vehicle theft.

general population to be alleged perpetrators and victims. Because we have no comprehensive list of the addresses of non-voucher holders, our comparison group is all households in the tract, including the relocated voucher holder households (a very slight proportion of the total).

Matching Rules

Matching incidents and arrests to households was challenging because most of the CPD crime and CHA voucher data do not contain apartment numbers, and most voucher holders, by far, live in multifamily buildings. Although the voucher database includes full names and ages, it excludes anyone who is not officially listed on the lease. That is, it is possible that a person involved in a crime lived in a voucher unit, but because they are not listed we would not be able to connect the crime with the correct household. To quantify this uncertainty, we created decision rules for connecting households, which we divided into three groups—exact matches, probable matches, and nonmatches. We first matched crimes to relocated households on the basis of street address before incorporating unit-level information. Because the crime rate for the general population (including voucher holders) is produced by calculating the total number of crimes per person in a given tract, no similar matching process is required.

Exact matches occur if the apartment number exists for both the matched crime and the relocated voucher holder record and the numbers match, if the address is a single-family unit, or if the first and last names in the crime record exactly match the first and last names of a member of the relocated household. Nonmatches occur if the apartment number exists for both the matched crime and the relocated voucher holder record and the numbers do not match or if the crime record can be exactly matched to a nonrelocated voucher holder record by the exact match process.

A probable match estimates the probability of each address match. We assign a probability of 100 percent if the matched crime and the voucher holder record are an exact match or if the matched address is a multifamily building with five or fewer units and the last name of the crime record matches the last name of a member of the relocated household. We assign a probability of 0 percent to nonmatches. We assign the remaining cases a probability, ranging from 0 to 100 percent, to matched crime and relocated voucher household records, calculated as the inverse of the total number of units at the matched address. In the few cases for which information on the total number of units at an address is not available, the probable match is calculated as the inverse of the median number of units (two) in voucher-holder buildings in the 12 selected tracts. We also estimate a maximum match figure, which represents the total number of matched crime and relocated voucher holder records. See the appendix for a more detailed discussion of the matching process.

Of all the part 1 violent and property crimes committed in the 12 selected tracts in 2008, we were able to classify 7 arrest records and 25 reported incidents as exact matches to residents of relocated households. After filtering out nonmatches, exact matches from other voucher holders, and going through the process of assigning match probabilities to inexact matches, we estimate that approximately 15.6 arrest records and 34.7 reported incidents match residents of relocated households. If all address-level matches that we could not identify as exact matches were treated as matches, relocated households would match 24 arrest records and 65 incident reports. Relocated voucher households represented a minimal share of part 1 crimes in the 12 selected tracts in 2008—587 arrests and 2,095 incidents involved a person living in these neighborhoods (exhibit 8).

Exhibit 8

Match Statistics for Part 1 Crimes, by Category

Report	Exact	Probable	Maximum	General Population
Arrests	7	15.6	24	587
Incidents	25	34.7	65	2,095

Source: Urban Institute analysis of 2008 Chicago Police Department administrative data and Chicago Housing Authority data

Because we do not attempt to match incident and arrest locations to non-voucher holder addresses, we use rates for the general population for comparison. People in relocated voucher households represented approximately 1 percent of the general population in the 12 selected tracts in 2008.

Defining Terms

In the following section, we define people associated with relocated households as definitely more likely to be alleged perpetrators or victims when the rate of exact matches of arrest or incident addresses to voucher addresses exceeds the rate of arrests or incidents for the general population. We define them as definitely less likely to be alleged perpetrators or victims when the rate for the maximum possible number of address matches is less than the rate for the general population. We define people associated with relocated households as probably more likely to be alleged perpetrators or victims when the rate of probable address matches exceeds the rate for the general population and as probably less likely to be alleged perpetrators or victims when the rate of probable address matches is less than the rate for the general population. Because of the uncertainty associated with the matching process, people associated with relocated households may be the voucher holder, someone who lives in the household, or someone listing the household as their place of residence on arrest or report of a crime incident to the police.

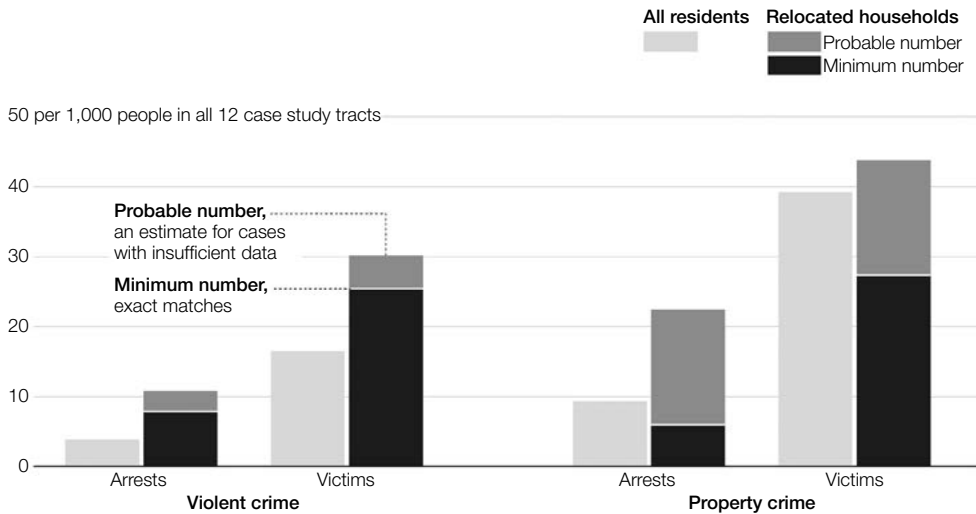
Results

Overall, in the 12 case study tracts, people associated with relocated households in 2008 were more likely than the general population (all people in the 12 case study tracts) to be both victims and alleged perpetrators of violent crimes, and they were probably (but not definitely) more likely to be both victims and alleged perpetrators of property crimes. People associated with voucher households specifically were probably about 2.5 times more likely to be arrested for violent crimes and 1.8 times more likely to be victims of a violent crime (exhibit 9). These same people were probably about 2.4 times more likely to be arrested for property crimes and 1.1 times more likely to be victims of a property crime.

Our models in the original research tested whether the association with crime rates varied according to household composition, but we found only weak connections. Our findings provide some support for the hypothesis that an existing connection is obscured by a dividing line in the voucher-holder population between older victims and younger perpetrators (although obviously youth and young adults are victimized, as well). We found that some of the difference in the rate of arrests for violent crimes can likely be attributed to juveniles ages 10 to 17. Juveniles were the

Exhibit 9

Relocated Households: Alleged Perpetrators and Victims in 2008



Notes: Relocated households were definitely more likely than the general population to be both victims and alleged perpetrators of violent crimes. The same trend appears to be true for property crimes, but the evidence is not conclusive. Urban Institute researchers matched Chicago Housing Authority data to Chicago Police Department data. In some cases, apartment-level address data were unavailable, creating significant uncertainty.

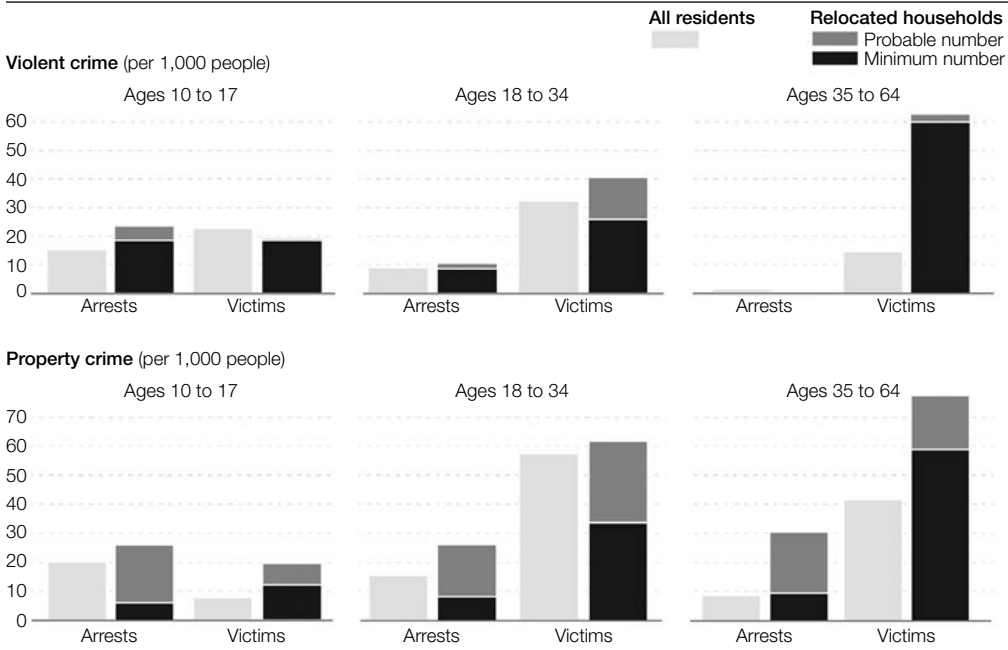
Source: Urban Institute analysis of data from the Chicago Police Department, the Chicago Housing Authority, and the U.S. Census Bureau

only age group associated with relocated households definitely more likely than their cohort in the general population to be alleged perpetrators of violent crimes. This age group also made up a disproportionately substantial share of the population in relocated households (34 percent) compared with juveniles in the general population (14 percent) in the selected tracts. When we separate the young adult age group into younger (ages 18 to 24) and older (ages 25 to 34) cohorts, we find, surprisingly, that the younger cohort was probably less likely to be alleged perpetrators and victims of violent crime, whereas the older cohort was definitely more likely to be alleged perpetrators and probably more likely to be victims of violent crimes when compared with their cohorts in the general population. We can likely attribute some of the difference in victimization rates for violent crime to middle-aged adults (ages 35 to 64) associated with relocated households—the only group definitely more likely than their cohort in the general population to be victims—who were about four times more likely to be victims of violent crimes than their cohort in the general population. Older adults made up approximately 21 percent of the population in relocated households compared with 43 percent of the general population of the 12 selected tracts.

The difference in arrest and victimization rates for property crimes seems to have been spread more evenly throughout the age distribution (exhibit 10). Juveniles (ages 10 to 17), young adults (ages 18 to 34), and older adults (ages 35 to 64) associated with relocated households were all either probably or definitely more likely to be both victims and alleged perpetrators of property crimes. Breaking the young adult age group associated with voucher households into younger (ages 18 to 24) and older (ages 25 to 34) cohorts, we find that both were probably more likely to

Exhibit 10

Victims and Arrestees by Age Demographic in 2008



Note: Because only seven people ages 65 and older were living in relocated households, this cohort is not included.
 Source: Urban Institute analysis of data from the Chicago Police Department, the Chicago Housing Authority, and the U.S. Census Bureau

be alleged perpetrators of property crimes. The younger cohort, however, was probably less likely to be victims of property crimes, whereas the older cohort was probably more likely to be victims of property crimes.

In general, some of the difference in crime rates between those living in relocated households and the general population can be attributed to a disproportionately substantial share of people living in the selected tracts in West Ridge (60 percent), which has lower rates of both violent and property crime for the population as a whole compared with the other three community areas. Only 25 percent of people in relocated voucher households live in the selected tracts in West Ridge. Thus, the relatively high rates in the other three community areas, which are home to most people living in relocated households, inflate the average for those people associated with relocated voucher households, whereas the relatively low rates in West Ridge deflate the average for the general population.

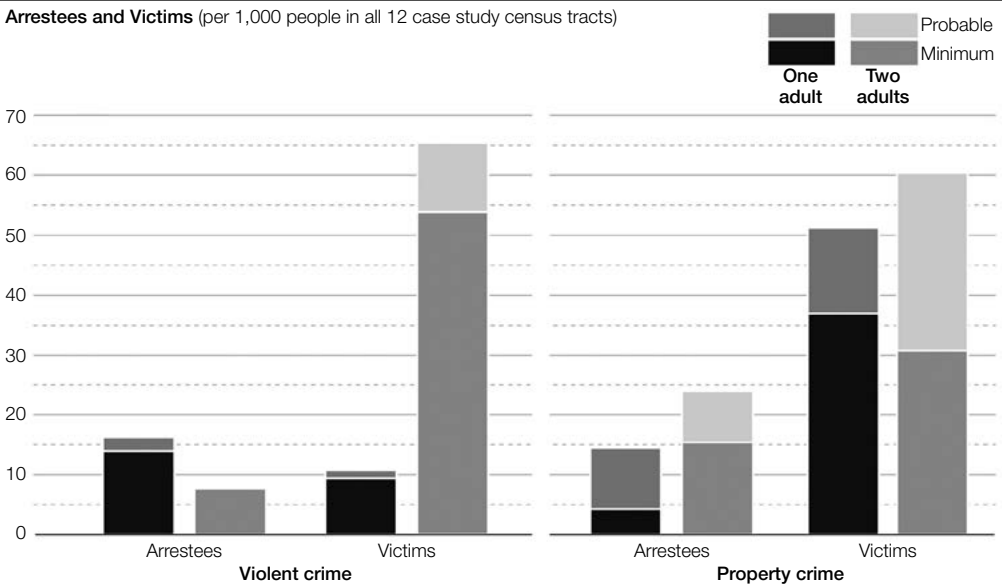
Our results are less reliable for elderly adults, who make up less than 2 percent of the population in relocated voucher households analyzed for this study. What little evidence we have indicates that older adults associated with relocated households are about as likely as elderly adults in the general population to be alleged perpetrators of violent crimes (the rate is nearly zero in all cases) and were definitely less likely to be victims of violent crimes. Older adults associated with relocated households were also definitely less likely to be alleged perpetrators of property crimes and definitely more likely to be victims of property crimes.

We also explored the difference in rates for one-adult versus two-adult households. A difference might mean that the supervision of juveniles suffered in one-adult households or that one-adult households were more likely to be victimized. We found that, compared with people associated with relocated two-adult households, people associated with relocated one-adult households were definitely less likely to be victims of violent crimes and definitely more likely to be alleged perpetrators of violent crimes (exhibit 11). People associated with relocated one-adult voucher households were also probably less likely to be victims and alleged perpetrators of property crimes. About 53 percent of relocated voucher households were headed by one adult, and only 28 percent had two adults present (the remaining households had more than two adults). The difference between the arrest rate for property crime and the arrest rate for violent crime seems to rule out that the primary underlying dynamic is unsupervised youth. Because we are analyzing a small population, we are unable to break down the data further to test explanations. For instance, the high violent crime victimization rate for two-adult households might be driven by a greater proportion of elderly households in that group or might simply be a result of having more adults to be subject to victimization. Such specific subpopulations unfortunately create a situation in which a single household can have a major effect on rates.

Because of the relatively few crimes that can be associated with voucher households when looking at specific community areas, we do not provide a breakout of our results by neighborhood.

Exhibit 11

Arrestees and Victims Associated With One- and Two-Adult Relocated Households in 2008



Source: Urban Institute analysis of data from the Chicago Police Department, the Chicago Housing Authority, and the U.S. Census Bureau

Conclusions and Policy Implications

Our previous efforts to determine the effects of public housing transformation on crime in Chicago and Atlanta found that crime rates in certain receiving neighborhoods, where the number of relocated voucher households exceeded a certain threshold density, decreased less than they would have if the relocated voucher holders had not moved to these neighborhoods. One key question the study could not answer was why even a relatively few relocated households in a given neighborhood would be associated with relatively higher crime rates in that neighborhood.

Our intensive case study of 12 selected tracts in Chicago in 2008 shows that voucher holders were definitely more likely to be both victims and perpetrators of violent crimes than the general population in these tracts, and they were probably more likely to be both victims and perpetrators of property crimes. These findings paint a more complex picture than typical media accounts portray—the image of relocatees inevitably bringing crime to their destination neighborhoods. Although some of the differences in crime rates can be attributed to distributional differences in the relative share of the population in certain tracts living in relocated voucher households, other demographic and household factors may help explain what drives this difference in crime rates.

Juveniles and young adults—those ages 10 to 34—associated with relocated voucher households tended to be more likely to be alleged perpetrators of violent crimes than the general population, whereas middle-aged adults associated with relocated voucher households were much more likely to be victims of violent crimes. All age groups associated with relocated households appeared to be more likely to be both victims and alleged perpetrators of property crimes. People associated with relocated one-adult households were more likely to be alleged perpetrators and less likely to be victims of violent crimes than people associated with relocated two-adult households. In addition, people associated with relocated one-adult households seemed to be slightly less likely to be both alleged perpetrators and victims of property crimes than people associated with relocated two-adult households.

This research raises additional questions, most notably why juveniles and young adults associated with relocatees tend to be more likely to commit violent crimes and why middle-aged adults are more likely to be the victims in their new neighborhoods. As noted in our previous study, ethnographic research would help us to better understand how voucher households affect neighborhood dynamics.

Our findings also reveal that the effect on crime rates cannot be considered solely a function of the increased concentration of voucher holders in the destination neighborhoods. The composition of the households is clearly a relevant and important factor in the distinction between victims and perpetrators, with pronounced policy implications. Further, Chicago neighborhoods with comparative increases in crime after the distribution of the former housing development tenants may not have experienced detriments in the overall socioeconomic status and criminality of the neighborhood but instead may have seen an alteration in the routine activity of community members that led to an increased opportunity for criminal events.

Although the basic demographic characteristics of relocatee households differ from those of the general population, they are not substantially different from those of other voucher households.

If the association of relocatee households with higher crime rates found in the model in our previous work were directly related to these characteristics, we would have expected to see a comparable association for all voucher households, which was not the case (Popkin et al., 2012b). Our current research shows that elements of this association may be related to higher rates of victimization and arrests in certain types of relocatee households. This finding can help inform policy directed at breaking the connection between relocatee households and higher than expected crime rates in their new neighborhoods.

Relocation Effects on Relocates and Receiving Communities

Although we found clear evidence that relocatee voucher households were associated with both incidents and arrests at rates higher than that of the general population, supporting our conclusions from the model, we cannot yet be certain why. Several established theories in criminological research may provide some explanation, however.

As high-crime public housing developments are torn down and residents relocate, movers may simply shift their (or their close associates') criminal behavior to a new neighborhood. Evidence of this type of spatial crime displacement across multiple U.S. cities is mixed (Kleinhans and Varady, 2011; Suresh and Vito, 2009; Van Zandt and Mhatre, 2009), although the most rigorous research suggests that this phenomenon is not occurring as a result of HOPE VI demolition (Cahill, Lowry, and Downey, 2011; Hartley, 2010; Santiago, Galster, and Pettit, 2003).

Mobility could disrupt relocatees' social networks and erode their social capital (Hagedorn and Rauch, 2007; Sampson, Raudenbush, and Earls, 1997). Moves could also affect youths' behavior in ways that cause them to engage more in crime; evidence suggests that frequent moves have negative consequences for youth, including poor educational attainment, risky sexual behaviors, and drug use (Coleman, 1988; Hagan, Macmillan, and Wheaton, 1996; Pribesh and Downey, 1999). Most significant to this discussion, youth who move frequently have an increased likelihood of committing violent crimes (Haynie and South, 2005), and research in Chicago found that youth who move out of their neighborhoods but remain in Chicago have an increased likelihood of being victimized, as well (Sharkey and Sampson, 2010). Whether transplanted youth are perpetrators or targets, crime would increase because more victims were in the neighborhood.

The relocation and movement of displaced public housing residents throughout the city alter the routine activities of the former public housing residents and receiving communities. The "routine activity approach" defines that most criminal acts require the convergence of likely offenders, suitable targets, and the absence of capable guardians. This theory emphasizes collaborative conditions that create the opportunity for criminal events and that the routine activities of individuals and communities function as a spatial-time schedule for potential convergences on criminal events (Birkbeck and LaFree, 1993; Cohen and Felson, 1979; Smith, 1984). The dispersion of activities away from households and increases in active lifestyles increase the opportunity for criminal events and victimization, as the movement away from one's household increases lack of guardianship in daily schedules (Cohen and Felson, 1979). As relocatees adjust their routine activities to account for the spatial relationship of their new housing to school, work, family, and so on, the opportunity to converge on the three essential elements of criminal activities will change accordingly.

Just as the spatial arrangement of the city's neighborhoods will affect crime rates, the physical characteristics and spatial arrangement of the community members' households will affect victimization rates. The characteristics of the relocatees' new housing and the technology and organization of the housing in the receiving communities affect the suitability of households as property crime targets and the capacity of people with criminal inclinations to overcome their targets (Cohen and Felson, 1979). New neighborhoods may offer security or guardianship measures that are more difficult for criminals to overcome. This factor can lead to increased or decreased guardianship, accordingly reducing or increasing the opportunity for victimization suitability, and it can also lead to increased difficulty for relocated potential offenders to commit property crimes successfully, increasing the rate of reported property crimes for those relocated offenders who are unfamiliar with the new security measures.

The perceived changes relocatees bring to receiving communities mostly affect social cohesion and community activities. In particular, because many public housing developments were notoriously dangerous, communities fear that the receipt of relocated public housing residents will increase crime and reduce property values (Cahill, Lowry, and Downey, 2011; Belden, Shashaty, and Zipperer, 2004). As more former public housing residents move into new neighborhoods, those neighborhoods experience an increasing awareness of the public housing residents and the expected increase in criminal behaviors. This perceived fear will have a greater effect on the communities' behavioral reactions to crime than the communities' objective risks to crime, increasing the receiving communities' evasive behaviors and decreasing exposure to crime for those households (Cohen and Felson, 1979; Smith, 1984). Fear of crime and the resulting change to evasive community behaviors increases the social anxiety and isolation in that community, thus decreasing the collective efficacy of the community. In this case, if new entrants disrupt the social cohesion and social control of a neighborhood, that neighborhood may be less able to police itself, effectively reducing the risks of committing crime and skewing a potential offender's—whether a new relocatee's or a current resident's—"risk-reward calculus" (Lim and Galster, 2009). Further, research from the Moving to Opportunity demonstration suggests that rising neighborhood racial segregation may lead to an increase in violent crime as a result of increased drug market activity, which is more likely in racially segregated areas (Ludwig and Kling, 2006).

On the other hand, the relocated households may experience relatively less fear of crime than they experienced in their old neighborhoods, increasing their time spent away from the home and active lifestyles, and in turn increasing their potential exposure to crime as both motivated offenders and suitable targets.

Although a number of reasons explain why crime might rise in receiving communities, the precise magnitude and direction of the effects may be related to the preexisting levels of crime in the receiving community, the distance travelled by the relocated voucher holders, and the age of the voucher holders. Research in New Orleans found that former prisoners who moved to locations outside New Orleans were 15 percentage points less likely to reoffend within a year of release than prisoners moving to locations within New Orleans (11 and 26 percent were reoffenders, respectively) (Kirk, 2009). To the extent that prisoners released from Illinois prisons tended to concentrate in a few disadvantaged neighborhoods where many voucher holders lived (La Vigne et al., 2003), and given that most prisoners return to live with friends and family on release (Fontaine and Biess, 2012),

moving from public housing may actually decrease crime rates among those connected to voucher households by separating criminals from their previous neighborhoods, depending on the distance of the move. Also, given that offending rates and association with criminal peers decline with age (Kirk, 2009), an influx of older voucher holders into a community may actually cause crime rates to fall. The direction of the effects in both cases may depend on the receiving communities' premove offending rates and the offending rates of incoming voucher households.

Policy Implications

Bearing in mind that our analysis was confined to a few neighborhoods that may not be representative, we nonetheless recommend that policymakers take several actions to mitigate the observed effects.

- Provide comprehensive supportive services for relocated households before and after relocation, with particular emphasis on households with teens.
- Use mobility counseling to ensure that residents make informed choices about their housing and neighborhood options and are educated on all possible housing and neighborhood options.
- Plan coordination with local law enforcement to ensure that patrol officers and narcotics and gang units are aware of the neighborhoods receiving relocated households and take action in preventing any violence that might result.

Research has already shown that former public housing residents have been subject to enormous stresses and face special challenges. The evidence in this article that the association with crime found in our previous study is not a result simply of members of relocated households bringing crime into the neighborhood, but of being the victims of crime, reinforces the need for intensive and continuing support tailored to the particular needs of these voucher holders in their new communities. As we pointed out in our previous brief, the benefits of this approach would accrue not only to the households in need but also to their neighborhoods, as well.

Support services and mobility counseling for households displaced from public housing will provide those households with a comprehensive understanding of their available options when searching for housing that accepts vouchers. Relocates who are more aware of receiving communities throughout Chicago will make more educated decisions regarding the selection of their new communities and housing. Given all their housing choices, relocates are more likely to choose communities that are closer to work, school, families, and so on. This choice will decrease the transportation of those households and time spent away from the house, thus decreasing the opportunities to become motivated offenders or suitable targets throughout daily, routine activities. Relocates will also be more likely to choose the neighborhoods and housing that provide the greatest security. When left to their own devices, relocates could more commonly choose the first or cheapest housing they find, which could have less security, be closer to or on the major roads in the neighborhood, be first-floor apartments, and so on—all characteristics that create a lack of security about the property and increase the chances of criminal opportunities. Offering services that educate relocates on all their housing options will increase the chances that relocated households choose the housing that is in an optimal area and provides optimal security for their household. Further, as

the relocatees are more satisfied with their housing and neighborhoods, they are less likely to move in the future, stabilizing the social network and guardianship of the relocatees and decreasing the negative consequences of moves on juveniles.

Disseminating the availability of all housing options to households displaced from public housing will also naturally disperse the relocatees throughout the city. Relocatees aware of all options are more likely to make decisions that are best for themselves and their families. Because not all locations, communities, houses, and so on are ideal for all relocatees, the relocatees will naturally choose housing options dispersed throughout the city. The distribution of the relocatees will decrease the number of relocated households entering each receiving community so that the receiving communities are not as aware of the influx of relocatees into their neighborhood and do not have an increased fear of perceived increases in criminal events. The indistinctness of these relocatees will minimize changes in the routine activities of receiving communities, thus minimizing changes in criminal opportunities and the likelihood of the relocatees becoming suitable targets relative to the whole community.

Appendix. Record-Matching Procedures

Detailed Procedures

Most of the crime and voucher data do not contain apartment numbers, and most voucher holders, by far, live in multifamily buildings. Although the voucher data provide full names and ages, to the extent that people may stay at a voucher household but not be reported in the voucher data, we would not be able to connect the crime with the correct household.

We created decision rules for connecting households, which we organized into three groups—exact matches, probable matches, and nonmatches. For all addresses where we matched crimes on street address alone (before incorporating unit number information), we applied the following rules.

Exact matches

- If the apartment number exists for both sides of a crime-and-address pair and it is a match, then the crime-and-address pair is an exact match.
- If the address reported is a single-family unit, as reported by the Cook County Assessor's Office, then the crime-and-address pair is an exact match.
- If the first and last names in the crime file exactly match the first and last names of anyone living in the voucher household, the crime-and-address pair is an exact match.

Nonmatches

- If the apartment number exists for both sides of a crime-and-address pair and it is not a match, then the crime-and-address pair is a nonmatch.
- If the crime can be matched exactly, using the preceding rules, to someone in the database of all voucher holders who are not relocated voucher holders, then the crime-and-address pair is a nonmatch.

Probable matches

- If a crime-and-address pair is an exact match according to the preceding rules, it is a 100-percent probable match.
- If a crime-and-address pair is a nonmatch according to the preceding rules, it is a 0-percent probable match.
- If a crime-and-address pair is matched on last name but not first name, and the unit is in a multifamily building with five or fewer units, it is a 100-percent probable match.
- If a crime-and-address pair does not meet any of the three preceding criteria, it is assigned a probable match score between 0 and 100 percent calculated by the inverse of the number of apartments at the address at which the unit is located (that is, a unit with four apartments would receive a 25-percent probable match score). The data for number of apartments are from U.S. Postal Service postal drops as of 2012, purchased from MelissaData, and is thus subject to some error (crimes from 2008 with addresses from 2012).
- In a few cases in which no data on the number of apartments in a building were available, the median number of apartments (two) at addresses of relocated households in the 12 tracts was used.

As should be understood from the preceding description, the probable match group is an estimate of the match rate for a tract. For all those cases for which we did not have enough information for an exact match in our pool of potential matches, we constructed the estimate by assessing the probability of a match, not by defining each case in this group as a match or nonmatch. In all tracts, for all types of crime, some number of arrests and incidents cannot be linked with certainty to voucher households. When comparing the rate at which voucher holder households are associated with crimes, either incidents or arrests, with the rate for all households in the tract, we can base our interpretation on several scenarios.

- The rate for definitely matched voucher holders is higher than it is for all households. In this case, we can report that voucher holders are definitely more likely to be victims or alleged perpetrators.
- The rate for definitely matched voucher holders is lower, and the highest rate based on probable matches is also lower. In this case, we know that that the arrest or incident rate is lower for voucher holders than the general population.
- The rate for definitely matched voucher holders is lower, and the “most likely a match” rate is higher. In this case, we will report that voucher households are probably, but not definitely, more likely to be connected to arrests or incidents than the general population. Whereas the “most likely a match” rate is usually not much higher than the definite match rate, the rate for all potential matches is often much higher.
- The rate for definitely matched voucher holders is lower, and the “most likely a match” rate is also lower, but the highest possible rate is higher. We can report that the arrest or victimization rate is probably lower for voucher holders than the general population. We can’t be certain, however.

Strengths of Our Approach

We are able to analyze the associations with crime both for the group for which we are certain of the match and for the larger group for which the association is probable. Because we have followed conservative rules for this estimate, we are confident that the probable match estimate is a reasonable representation of the actual association.

We are examining neighborhoods with relatively high levels of relocated households, which reduces the risk of spurious or coincidental associations. When possible, we look at data in the aggregate across neighborhoods and broken out by neighborhood, type of crime, and household characteristics.

Shortcomings of Our Approach

We have a particular issue with having street addresses that match but being unable to match apartment numbers. This issue creates a range of addresses that may or may not be matches with our voucher holder sample. We are able to do some matching on resident names, but it is possible that people not on the voucher record are living in the voucher holder's residence. In those cases, it would be appropriate to consider the crime as associated with relocation.

Our comparison is against the population of a tract in general, so the analysis is only as strong as the extent to which the full tract population is comparable with the relocated voucher holders. Voucher holders may have victimization rates similar to those of other households in the same type of housing, but if that housing is a minimal part of the stock in a given tract, our analysis will not be fine grained enough to detect the similarity.

Although we are able to match some names, we are primarily matching the address of the incident or arrestee with the address of the voucher holder. Therefore, we are identifying whether specific voucher households, not the voucher holders, are connected to incidents or arrests. This approach is complementary to our model, which detected an effect based on the movement of voucher households, but it still leaves us with some questions on the role of official and unofficial household members. We try to address the issue in the results section by looking at characteristics of arrestees and victims, particularly age, and voucher household characteristics.

Acknowledgments

The authors thank George Galster and Wesley Skogan for their valuable contributions to the methodology and report. At the Urban Institute, the authors are grateful for the graphic design contributed by Timothy Meko. They acknowledge the John D. and Catherine T. MacArthur Foundation and Chicago Housing Authority (CHA) for their generous support of this work. Finally, the authors acknowledge the CHA for its collaboration, transparency, and commitment to evidence-driven policymaking, and they acknowledge the Chicago Police Department (CPD) for support and data access. The findings and conclusions presented are those of the authors and do not necessarily reflect the opinions of their funders; the CHA; the CPD; or the Urban Institute, its trustees, or its funders.

Authors

Christopher Hayes is a research associate at the Urban Institute.

Graham MacDonald is a research associate at the Urban Institute.

Susan Popkin is Senior Fellow and Director of the Program on Neighborhoods and Youth at the Urban Institute.

Leah Hendey is a research associate at the Urban Institute.

Allison Stolte is a research assistant at the Urban Institute.

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Alcohol, Drug, and Criminal History Restrictions in Public Housing

Marah A. Curtis

University of Wisconsin-Madison

Sarah Garlington

Boston University

Lisa S. Schottenfeld

Mathematica Policy Research

Abstract

Housing assistance programs are a crucial resource for poor households. Access for families who include a member with a history of alcohol or drug use or a criminal record, however, varies considerably across public housing authorities (PHAs), because alcohol, drug, and criminal history restrictions in the housing assistance programs determine access to this scarce benefit. Very little is known about the specific rules facing poor families who apply for or use public housing. This article analyzes the alcohol, drug, and criminal history provisions governing access to or eviction from public housing using data from 40 PHAs across the country. The data show that nearly all PHAs institute more stringent bans than required by federal law and that individual PHAs exercise a great deal of discretion in setting ban lengths and defining individual problematic behavior. As a result, similar households may encounter radically different rules when attempting to access or retain housing assistance, even within a single PHA. The decision to define those with alcohol, drug, or criminal histories as categorically undeserving of housing assistance undermines other important public policy goals to treat similar populations equitably and to support ex-offenders and their families.

Introduction

The federal government funds three primary housing assistance programs: the public housing (PH) program, the Housing Choice Voucher Program (HCVP), and Section 8 project-based rental assistance, which together serve approximately 4 million low-income families.¹ The primary goal of these programs is to provide a subset of low-income households with stable, affordable housing (Committee on Ways and Means, 2004). All three programs reduce the cost of housing for participants and are governed by federal guidelines setting income eligibility and subsidy levels.²

All applicants to and residents of housing assistance programs are subject to federal alcohol, drug, and criminal activity restrictions, intended to increase the safety of assisted housing and to award a scarce benefit to “deserving” applicants (HUD, 1996; McCarty et al., 2012). These restrictions require that applicants be screened for alcohol use that interferes with the community (hereafter, “alcohol abuse”), other drug use, and past criminal activity. Applicants may be denied housing assistance if they, or anyone in their household, are found to have engaged in certain activities. In addition, households already receiving assistance may be evicted for behaviors related to alcohol abuse, drug use, and criminal activity. Public housing authorities (PHAs)—governmental entities that operate at the state or local level—administer the PH program and HCVP and are responsible for enforcing these federal alcohol abuse, drug use, and criminal history restrictions within their programs.

In an effort to empower PHAs to respond to local crime conditions, federal guidelines require the PHAs to implement certain alcohol abuse, drug use, and criminal activity restrictions, but they also give PHAs the discretion to create more severe restrictions. As such, the screening criteria for alcohol, drug, and criminal history vary tremendously across PHAs (LAC, 2004; Lundgren, Curtis, and Oettinger, 2010; McCarty et al., 2012). Further, to enable PHAs to consider applicants individually, PHA staff have broad discretionary power in determining the circumstances under which restrictions should apply and to whom. Many PHAs, for example, implement policies that individuals *may* be banned from assisted housing for certain offenses, leaving the final decision up to an individual PHA worker.

This set of circumstances raises three important issues that are of concern to policymakers. First, inter-PHA variation in the application of alcohol, drug, and criminal history restrictions means that similar households in different locations may encounter radically different rules when attempting to access or retain housing assistance. Second, the significant level of discretion awarded PHA staff ensures that similar households may be evicted, awarded assistance, or denied assistance, even within a single PHA. Third, the decision to define those with alcohol, drug, or criminal histories as categorically undeserving (HUD, 1996) undermines other important public policy goals to support ex-offenders and their families (Donovan and Henriquez, 2011).

Despite these concerns, very little is known about the specific alcohol, drug, and criminal history restrictions by which poor families are judged when they apply for or use housing assistance. To

¹ About 16 million families meet the eligibility requirements for housing assistance (McCarty et al., 2012).

² These guidelines generally require households to contribute no more than 30 percent of their income toward housing.

address this gap, this article aims to illuminate differential interpretation and implementation of these restrictions among PHAs in their PH programs. We collected primary policy data to analyze the range of banned behaviors, penalties, and discretion available to workers across a sample of PHAs in large cities across the nation. We review the standards PHAs use when evaluating evidence of misconduct or defining alcohol abuse or drug use to ban a household from receiving assistance. We focus on the PH program because PHAs are evaluated on their ability to demonstrate measurable progress on crime and drug reduction strategies in their annual performance reports to the U.S. Department of Housing and Urban Development (HUD, 2008). We therefore expect more agreement between a PHA's restrictions and implementation in the PH program.

Legislative Background

Crime and drug enforcement strategies in public housing have become increasingly vigorous during the past several decades. In an attempt to reduce drug-related crime and increase community well-being, public housing policies have (1) increased the penalties attached to behaviors deemed problematic and given PHAs extensive discretionary power in evaluating applicants and residents, (2) held residents accountable for the behavior of a broader range of actors (including minors and social associations), and (3) increased the oversight of and penalties for PHAs that fail to demonstrate progress on antidrug and crime-reduction strategies. The Anti-Drug Abuse Act of 1988³ required PHAs to construct lease clauses allowing for the eviction of tenants who engaged in drug use or other behaviors that could threaten the safety of other tenants (Blanks, 2002–2004). The Quality Housing and Work Responsibility Act of 1998⁴ supported PHAs' right to exclude applicants with a criminal history and use their discretion to determine which applicants were possible risks to the safety of the community. In addition, the Cranston-Gonzalez National Affordable Housing Act of 1990 (NAHA)⁵ imposed a mandatory 3-year ban on the readmission of tenants evicted for drug-related criminal activity. PHAs have the option of extending the ban beyond 3 years. The Housing Opportunity Program Extension Act of 1996 (HOPEA)⁶ further strengthened eviction rules and called on the National Crime Information Center and local police departments to provide PHAs with applicants' criminal records (Human Rights Watch, 2004; Mazerolle et al., 2000). Further, HOPEA allowed for PHAs to deny applicants who were believed to be using drugs or abusing alcohol or who were found to have a pattern of alcohol or drug use that might threaten the health or safety of other tenants. Several PHAs currently have drug-testing policies in their public housing programs (McCarty et al., 2012). Federal policies neither permit nor prohibit PHAs from testing residents or applicants for the presence of drugs.

The U.S. Supreme Court has awarded PHAs the authority to hold a public housing resident accountable for the behavior of a broad range of actors, even if the resident in question has no knowledge of any objectionable behavior. In *U.S. Department of Housing and Urban Development v. Rucker*

³ Public Law 100-690.

⁴ Public Law 105-276.

⁵ Public Law 101-625.

⁶ Public Law 104-120.

(HUD, 2002), the Court unanimously upheld the rights of PHAs to evict an entire household based on the criminal activity of one member or guest without specific proof that the leaseholding tenant had knowledge of the activity. Other policies have sought to evaluate PHAs' ability to reduce alcohol, drug, and criminal activity. For example, NAHA required HUD to develop a broad set of performance indicators to evaluate PHAs (Clinton, 2005). Well-performing PHAs are rewarded with increased flexibility in management decisions, whereas poor performers can face serious sanctions.⁷ Antidrug and security indicators are a heavily weighted performance indicator for PHAs, indicating that PHAs likely place great importance on meeting goals in this particular area.

Regulatory Background

Although legislation has awarded PHAs a significant level of discretion in applicant and resident evaluation, a set of federal regulations provides PHAs with baseline restrictions on alcohol abuse, other drug use, and criminal history. Housing assistance programs are required to deny applicants who (1) have been evicted from public housing within the past 3 years for drug-related reasons, (2) are on the lifetime sex offender registry in any state, (3) have been convicted of manufacturing methamphetamines on public housing property, (4) are using illegal drugs currently, or (5) are abusing alcohol in a manner that interferes with the public housing community.⁸ Although all PHAs must comply with these regulations, PHAs are also granted considerable discretion to extend these bans to meet local security goals. In addition to meeting these baseline requirements, PHAs are encouraged to consider individual or mitigating circumstances when making eviction and denial decisions.

Previous Research

Systematic data on alcohol, drug, and criminal history restrictions in the housing assistance programs are sparse. Limited research suggests that PHAs have responded to these policies by creating more extensive bans than required. These bans consider alcohol, drug, and criminal behaviors outside federal requirements when screening applicants. We identified only three reports that consider the topic. The first, Lundgren, Curtis, and Oettinger (2010), reviewed postincarceration policies for those with criminal drug convictions and considered access to housing assistance, employment, education, and receipt of Temporary Assistance for Needy Families (TANF) and the Supplemental Nutrition Assistance Program (SNAP, or food stamps). These researchers found that, for those who have been convicted of a drug felony, bans on access to housing assistance often surpass the 3-year ban required in the federal mandates. Their analysis suggests that at least 12 states have adopted longer bans, which vary in length depending on the type of conviction. The second relevant report,

⁷ Each indicator is assigned a weight between 1 and 3 relative to its importance in the Public Housing Management Assistance Program scoring. For example, antidrug and security indicators are assigned a weight of 3, the average time it takes an agency to repair and turn around a vacant unit is assigned a weight of 2, and having a system to track inspection and repair of units and systems has a weight of 1 (HUD, 2008).

⁸ "Denial of Admission and Termination of Assistance for Criminals and Alcohol Abusers," 24 CFR § 982.553. *Federal Register* 68 (28805) April 1, 2010.

McCarty et al. (2012), reviewed drug-testing and crime restrictions in TANF, SNAP, and housing assistance in a Congressional Research Service report for Congress. Their findings emphasize the complex nature of alcohol, drug, and criminal restrictions in the three housing assistance programs and point out that the only method for knowing what set of policies is in effect in the PH program is a systematic review of the Admissions and Continued Occupancy Policy (ACOP) document for a specific PHA. The third publication, from the Legal Action Committee (LAC, 2004), reported on state legal barriers confronting people with criminal records and reviewed nine domains, including PH. LAC (2004: 19) produced a grade for each state based on the extent to which “its laws and policies create roadblocks to reentry.” For public housing, LAC relied on reports from the PHA in the largest city in the state. The report provides data on which states consider each applicant’s personal circumstances when making a decision (rather than using preset bans for specific criminal offenses) and whether conviction is considered in determining eligibility.

We extend this minimal body of research by considering the alcohol, drug, and criminal history restrictions contained in ACOPs for public housing in a number of large cities across the nation. We systematically review the specific activities or behaviors that result in a ban, ban length, and the extent to which PHA workers are allowed to use their discretion to consider individual circumstances.

Data and Methods

To conduct a systematic review of PHA policies related to alcohol, drug, and criminal history, we collected ACOPs, reviewed them for admissions and eligibility criteria, and categorized their restrictions. In this section, we provide detail on our data collection strategy, search methods, textual analysis, and categorization strategy.

Data Collection

We collected data from PHAs across the country to examine admission and occupancy policies related to alcohol, drug, and criminal history that result in a range of time-specific bans. We first selected any PHA that covered an entire state: the Alaska Housing Finance Corporation, the Delaware Housing Authority, and the Hawaii Public Housing Authority. We then chose the PHA in the city with the largest population in a given state (32 states). In those states where we were unable to get the admission and occupancy policies for the PHA in the largest city, we selected the second largest city’s PHA (5 states). Using these methods, we were able to collect data from 40 of the 50 states. The 10 states for which we were unable to obtain data from the PHA in either the first or second largest city are Alabama, Arkansas, Idaho, Kentucky, Maine, Mississippi, Rhode Island, Utah, Vermont, and Wyoming.⁹ The appendix includes the states and the PHAs included in our analyses.

⁹ Washington, D.C. PHA data also were not available.

Search Methods

We conducted a systematic Internet search to locate published documentation of PHAs' admission and occupancy guidelines. We used the Google search engine to locate the individual PHA websites using the search terms "[city name]" and "housing authority." We then searched each PHA website for policy documents regarding admission and occupancy in public housing developments, often referred to as ACOPs. When these documents were not available directly through the PHA website, we conducted an Internet search using the Google search engine and search terms "[name of] housing authority," "admissions policy," "admissions and continued occupancy policy," "ACOP," and "eligibility." We found 32 ACOPs on line using these search terms. ACOPs for 2 states were available on HUD's website and downloaded. We contacted the remaining 16 PHAs by telephone or e-mail to request the documents and received 6 ACOPs. The 10 states with missing data are those from whom we could not access information either on line or via phone.

Note that the absence of an ACOP means only that documentation was unavailable for our textual analysis. PHAs may have limited funding for website maintenance and limited staff available to respond to requests for information from unaffected parties (for example, academic researchers). We cannot comment on how PHAs train staff on protocols for screening residents and applicants according to mandatory restrictions, nor can we speak to how PHAs inform residents and applicants of rules that affect admission and residency. We do, however, point out that PHAs have both a financial and a management incentive to enforce restrictions, given that they are evaluated annually on how well they meet crime- and drug-reduction strategies (HUD, 2008).

Textual Analysis

We carefully reviewed the ACOPs for eligibility and admissions criteria. Two of the authors did an initial review of a subset of ACOPs to collect key language relevant to applicant exclusions, with special attention to alcohol, drug, and criminal history restrictions. After the initial review, we developed coding criteria based on common PHA language, including terms such as "eligibility," "screening," and "one-strike policy." Both reviewers then coded all eligibility sections of PHA documents for identified terms. The reviewers also coded any additional references to guidelines regarding the exclusion of applicants. The reviewers used line-by-line coding to ensure that any discussion of exclusion was noted. This method was used because precise exclusion language was often inconsistent among PHAs.

Categorizing Alcohol, Drug, and Criminal History Restrictions

To understand how policies differ at the PHA level, we collected data on restrictions across four dimensions: (1) grounds for bans from housing, (2) the length of bans for each activity or behavior, (3) whether individual circumstances can be considered when making a ban decision, and (4) whether the ban length is specified or left to worker discretion.

Some HUD language regarding alcohol abuse, other drug-related activity, and violent behavior, in general, was standard and included in each ACOP. Many PHAs, however, then delineated specific additional behaviors and ban lengths. We used HUD's language to construct four ban categories to capture the detailed information available in the ACOPs. The four categories are (1) bans for

drug-related activities, (2) bans for alcohol or nonviolent criminal activity, (3) bans for violent crimes, and (4) bans for other reasons. Each category contains activities that range in severity. For each category of offense, we review whether the PHA mentions a ban, whether the ban length is specified, and how many PHAs note that staff may consider individual circumstances in setting the ban length.

Results

Bans for drug-related activities, for alcohol or nonviolent criminal activity, and for violent crimes were common among our sampled PHAs. Ban lengths varied widely depending on the offense, although many PHAs chose to leave ban lengths to the discretion of their staff. We discuss each ban category separately.

Bans for Drug-Related Activities

We first examine bans specified under drug-related activities. Exhibit 1 notes nine different categories of bans, ranging in severity from “pending charges” for a drug-related activity to “manufacturing” drugs. The most frequently mentioned ban category is “illegal drug use, abuse, possession, distribution, and trafficking,” which 93 percent (37 of 40) of the PHAs mention. More than one-half (22) of the PHAs do not specify a ban length for this offense. In 12 of the PHAs, workers have the discretion to consider individual circumstances when deciding whether to impose the ban on an applicant or resident household. A ban for previous eviction because of drug-related activity in either public or private housing is mentioned by 34 of the 40 PHAs. Most (30) PHAs impose bans of between 3 and 5 years for this offense, and one-half (15) of those allow workers discretion in setting the length of the ban. A 6- to 10-year ban for this offense is enforced by 4 PHAs, and 2 PHAs

Exhibit 1

Bans for Drug-Related Activities

Activities	PHA Mentions Ban	No Ban Length Specified (circumstances)	1- to 2-Year Ban (circumstances)	3- to 5-Year Ban (circumstances)	6- to 10-Year Ban (circumstances)	Lifetime Ban (circumstances)
Illegal drug use, abuse, possession, distribution, trafficking	37	22 (12)	8 (3)	14 (8)	2	0
Eviction from public or private housing	34	1	0	30 (15)	4 (3)	2 (1)
Unspecified “activity”	29	15 (3)	2 (1)	18 (3)	1 (1)	0
Manufacturing	9	2	0	6 (1)	2	2
Arrest	6	5	1	0	0	0
Conviction	6	3	0	2	1	0
Intent to distribute	5	1	1	3	1	1
Warrant	2	2	0	0	0	0
Pending charges	2	2	0	0	0	0

PHA = public housing authority.

Notes: N = 40 PHAs. Individual PHAs can report multiple ban lengths for an offense or may have different ban lengths for similar offenses. Numbers in parentheses indicate the number of PHAs that take individual circumstances into account.

institute lifetime bans. These bans are in direct response to federal guidelines for the treatment of households that have been evicted from public housing within the past 3 years for drug-related reasons.¹⁰ PHAs have expanded on this mandate to include evictions from private housing as well. More than one-half (29) of the PHAs mention bans for unspecified “activity” related to drugs. Note that interaction with the criminal justice system via a warrant, pending charges, or previous arrest for drug-related activities results in bans in several of the PHAs, regardless of the criminal justice result (for example, conviction or not).

Bans for Alcohol or Nonviolent Criminal Activity

We now consider bans specified under alcohol or criminal activity in exhibit 2. The most frequently mentioned activity in the ACOs is alcohol use or abuse. Nearly every PHA (37 of 40) mentions a ban in this category, although most (32) do not specify a ban length. Bans for alcohol activity range rather dramatically from 6 months to, in 1 PHA, a lifetime ban. Overall, the prohibition on making public housing available to those with an alcohol use or abuse history is clearly manifest across our sample. PHAs are responsive to the federal mandate to exclude from housing those with alcohol abuse histories.¹¹ Bans for previous eviction for criminal activity in either public or private housing are mentioned by most (31) of the PHAs. Nearly one-half, however, do not specify the ban length. For PHAs that do mention a ban length for previous evictions because of criminal activity, these bans range from 1 to 2 years (5 PHAs) to a lifetime ban (3 PHAs), with 13 PHAs noting ban lengths of 3 to 5 years. Only 3 PHAs specify that workers consider individual circumstances when implementing this ban. Also, as in exhibit 1, more than one-half (27) of the PHAs enforce bans for unspecified criminal “activity” or “incidents.” One-half (20) of the PHAs do not specify a ban length for this open-ended category.

Some PHAs elected to impose bans for very specific criminal behaviors. These bans are for such offenses as “theft,” “burglary,” “robbery,” or “shoplifting” (14 PHAs); “criminal arson” (13 PHAs); “prostitution” or “solicitation” (7 PHAs); and “fire-related” activities (4 PHAs). Note that these specific offenses are mentioned far less frequently than the broader category of “unspecified activities or incidents” (27 PHAs). This finding suggests that PHAs concentrate on providing wide latitude for eviction and denials based on behaviors that either are directly mentioned in the federal mandates or may not be criminally enforceable. Finally, involvement with the criminal justice system via a previous “conviction,” “parole,” “parole violation,” “probation,” “arrest,” “warrant,” or “driving violation” provides potential grounds for a ban.

Bans for Violent Crimes

We next consider bans for violent crimes in exhibit 3. We expected these bans would be extensive, given the overarching goal of these provisions to maintain the safety and security of public housing by directly targeting criminal behavior. Instead, we found 17 categories of activities with ban lengths either unspecified or clustering in the 3- to 5-year range. This finding suggests that these restrictions

¹⁰ 24 CFR § 982.553.

¹¹ 24 CFR § 982.553.

Exhibit 2

Bans for Alcohol or Nonviolent Criminal Activity

Activities	PHA Mentions Ban	No Ban Length Specified (circumstances)	6-Month Ban	1- to 2-Year Ban (circumstances)	3- to 5-Year Ban (circumstances)	6- to 10-Year Ban (circumstances)	Lifetime Ban (circumstances)
Alcohol use/abuse	37	32 (8)	2	5 (3)	3 (1)	0	1 (1)
Eviction from public or private housing	31	15 (3)	0	5 (1)	13 (1)	2	3
Unspecified "activity"/"incidents"	27	20 (4)	0	5 (1)	6 (1)	3	0
Theft, burglary, robbery, shoplifting	14	2	1	3	10 (2)	1	1
Criminal arson	13	2 (1)	0	0	3	3	6 (1)
Conviction (all types)	13	5 (1)	0	1	6 (2)	5 (2)	0
Prostitution, solicitation	7	2	0	2	4 (1)	0	0
Parole, parole violation, probation	5	2	0	1	1	1 (1)	0
Arrest	4	4		0	0	0	0
Fire related	4	3	0	0	1	0	0
Lewd conduct, disorderly, public drunkenness, harassment, indecent exposure or conduct, mayhem, fighting, resisting arrest	4	1	0	2	2		0
Criminal pattern (various definitions)	4	3	0	0	1	0	0
Warrant	3	3	0	0	0		0
Driving violation (including DWI)	3	1	0	2	1	0	0
Violation protective order	1	0	0	1	0	0	0

DWI = driving while intoxicated. PHA = public housing authority.

Notes: N = 40 PHAs. Individual PHAs can report multiple ban lengths for an offense or may have different ban lengths for similar offenses. Numbers in parentheses indicate the number of PHAs that take individual circumstances into account.

are meant to supplement the existing criminal legal framework by adding enforcement power to less well-defined behaviors. PHAs mention a wide range of offenses, from “property violence” or “vandalism” in 28 ACOPs to “homicide,” “murder,” or “manslaughter” in 17 ACOPs. As in exhibits 1 and 2, one of the most frequently mentioned categories is unspecified violent “activity” (34 PHAs). Ban lengths for this offense range from 1 to 2 years (3 PHAs) to a lifetime ban (1 PHA). More than one-half of the PHAs (18) that mention unspecified activity have ban lengths of between 3 and 5 years, and another 5 PHAs carry bans from 6 to 10 years. Again, as in exhibits 1 and 2, criminal justice involvement in the form of a previous conviction or arrest (related to a violent offense) is grounds for a ban in 3 PHAs.

Exhibit 3

Bans for Violent Crimes

Crimes/Activities	PHA Mentions Ban	No Ban Length Specified (circumstances)	1- to 2-Year Ban (circumstances)	3- to 5-Year Ban (circumstances)	6- to 10-Year Ban (circumstances)	Lifetime Ban (circumstances)
Unspecified “activity”	34	16 (2)	3 (1)	18 (6)	5 (1)	1 (1)
Property violence or vandalism	28	18	2	10 (1)	4 (1)	1
Sexual crimes	19	6 (1)	1	9 (1)	3	2
Homicide, murder, manslaughter	17	5 (1)	0	8	4	2
Assault, crime against a person	17	6 (1)	3	10 (2)	3	1
Threats, stalking	15	6	2	9 (1)	0	0
Firearms related, including explosives	12	4 (1)	1	7 (1)	2	0
Sexual crimes against children	9	3 (1)	0	2	1	3 (1)
Domestic violence	9	1 (1)	2	6 (2)	1	0
Abuse/neglect of child, elderly, or disabled person	9	4 (2)	1	5 (1)	0	0
Kidnapping, false imprisonment	7	2	0	2	2	1
Home invasion	4	0	0	4 (1)	0	0
Terrorism	3	1	1	1	0	0
Hate crimes, civil rights violations	3	2	0	1	0	0
Conviction	2	0	0	2	0	0
Gang related, organized crime	2	0	0	2 (1)	0	0
Arrest	1	1	0	0	1	0

PHA = public housing authority.

Notes: N = 40 PHAs. Individual PHAs can report multiple ban lengths for an offense or may have different ban lengths for similar offenses. Numbers in parentheses indicate the number of PHAs that take individual circumstances into account.

Bans for Other Reasons

Finally, we consider bans noted across a number of PHAs that were not included in bans for drug-related activities, bans for alcohol or criminal activities, or bans for violent crimes. Exhibit 4 reviews three specific reasons that trigger a ban: “neighbor disturbance,” “disorderly house,” and “incarceration.” More than one-half of the PHAs (23) mention “neighbor disturbance,” with most (19) not specifying a ban length, 4 enforcing a 3- to 5-year ban, and 1 enforcing a 6- to 10-year ban. “Disorderly house” is mentioned by 8 PHAs, 5 of which do not specify a ban length and 3 of which enforce bans of between 1 and 5 years. Although a history of criminal activity is not mentioned as one of the four mandated ban categories by the federal government, the broadly expanded ability of PHAs to exclude housing applicants with such a history is an observable pattern across all exhibits. In exhibit 4, we found that 2 PHAs directly mention incarceration (without reference to the reason for incarceration) as a justification for exclusion from public housing, with ban lengths ranging from 6 months to 2 years.

Exhibit 4

Bans for Other Reasons

Reasons	PHA Mentions Ban	No Ban Length Specified (circumstances)	6-Month Ban	1- to 2-Year Ban	3- to 5-Year Ban	6- to 10-Year Ban
Neighbor disturbance	23	19 (1)	0	0	4	1
Disorderly house	8	5	0	2	1	0
Incarceration	2	0	1	1	0	0

PHA = public housing authority.

Notes: N = 40 PHAs. Individual PHAs can report multiple ban lengths for an offense or may have different ban lengths for similar offenses. Numbers in parentheses indicate the number of PHAs that take individual circumstances into account.

Thus far, we have primarily focused on alcohol, drug, and criminal history behaviors that subject tenants and applicants to bans. We also have discussed the discretion PHA staff have in setting ban lengths and considering mitigating circumstances. The results of this analysis suggest significant differences in how public housing applicants and residents are treated across the sample PHAs.

Evidence of Alcohol, Drug, or Criminal Activity

Bans instituted for “unspecified” criminal, drug, or violent “activity or incidents” are common across our sample, as are bans for alcohol use or abuse. What is not clear, however, are how either “unspecified” activity or alcohol or drug use is defined to institute a ban. We did not conduct an extensive review of the definitions of alcohol or drug use or of the standards of proof needed to deny housing assistance, as such a review was beyond the scope of this article. We do, however, offer several dominant themes evident in our review of the ACOPs.

Standards of Proof

Federal regulations stipulate that PHAs may evict a household if they determine that an individual in the household has engaged in criminal activity “based on a preponderance of the evidence,”¹² a weaker standard than used in criminal trials. A number of PHAs include language in their ACOPs highlighting the use of this standard.¹³ When making decisions about whether to evict residents or deny applicants for criminal activity, PHAs can use evidence that is significantly weaker than that which would be required to convict in criminal court. Further, PHAs may evict a household for criminal activity regardless of whether an arrest or conviction has occurred.¹⁴

¹² “Denial of Admission and Termination of Assistance for Criminals and Alcohol Abusers,” 24 CFR § 982.553(c). *Federal Register* 68 (28805) April 1, 2010.

¹³ These ACOPs offer the following definition and explanation of the standard: “Preponderance of evidence is defined as evidence which is of greater weight or more convincing than the evidence which is offered in opposition to it; that is, evidence which as a whole shows that the fact sought to be proved is more probable than not. The intent is not to prove criminal liability, but to establish that the act(s) occurred” (EBRPHA, 2011: 70; Hawaii Public Housing Authority, 2012: 11; Housing Authority of Baltimore City, 2011: 28–29; Housing Authority of the City of Bridgeport, 2011: 22).

¹⁴ 24 CFR § 982.553(c).

A number of ACOPs provide some detail about the types and sources of evidence that can be used to demonstrate an alcohol, drug, or criminal history. Criminal history can be collected from a variety of sources. In general, ACOPs establish that, although “credible evidence” might be accessed from police or court records, “testimony from neighbors, when combined with other factual evidence, can be considered credible evidence” (Hawaii Public Housing Authority, 2012: 11; Housing Authority of Baltimore City, 2011: 28–29; Housing Authority of the City of Bridgeport, 2011: 22–23). Other sources of “credible evidence” described by ACOPs include documentation of drug raids, arrest warrants, evidence gathered by inspectors during home inspections, and evidence gathered from the housing authority’s hotline. The Housing Authority of the City of Bridgeport’s ACOP (2011: 22–23) specifies that caller identities are “not required and shall remain private,” indicating that anonymous reports of criminal activity can be used as evidence against a household.

Alcohol Abuse or Drug Use

PHA methods for determining whether an individual is engaged in alcohol abuse or drug use vary widely. Many PHAs provide no concrete information about how a household’s alcohol abuse or other drug use would be determined or evaluated. PHAs that documented a process for identifying applicants or residents who abuse alcohol or use other drugs note a range of tactics. For example, the Indianapolis Housing Agency (2010) imposed mandatory drug testing of applicant households, whereas the Charlotte Housing Authority (2012) required applicants to sign consent forms allowing for the PHA to contact third parties involved in an applicant’s life (for example, social workers, police officers, and landlords). These third parties can be interviewed to gather information regarding the household’s eligibility, including alcohol abuse or drug use.

Discussion and Policy Implications

As our findings demonstrate, local PHAs use a wide range of criteria to exclude households from public housing, focusing primarily on those with alcohol, drug, or criminal histories. Federal policy intentionally incorporates discretion to allow for PHAs to accommodate local conditions and individual cases. We argue that this discretion, along with the criteria HUD uses to assess PHAs, creates incentives for stringent enforcement. The expansion of PHA discretion clearly serves a vital purpose in allowing local authorities to use public housing resources according to community needs. As we have shown, however, PHA bans create barriers to households that contain a member with suspected or verified alcohol, drug, or criminal history. Our analysis also shows that similarly situated households face markedly different public housing rules among but also within PHAs, depending on how individual workers use their considerable discretionary power in determining admissions and evictions. Our cursory review of how PHAs define alcohol abuse, other drug use, and the proof needed to enforce bans reveals considerable differences. Public housing residents, applicants, and those on waiting lists may have little information about the bans, the costs of association with family members with alcohol, drug, or criminal histories, and the breadth of information PHAs use to determine access. Further, PHAs are permitted to impose bans for “unspecified” activities without the necessity of a formal legal process.

Housing is a scarce resource and, as such, is not available to all households that qualify. Through discretion, local PHAs are charged with creating a public housing community that meets strict public safety metrics developed by HUD. We argue that PHA discretion, as captured in this analysis, expands on HUD exclusion criteria and creates the incentive to institute de facto bans that affect some of the most housing-needy populations. The Secretary of HUD, Shaun Donovan, urged PHAs to use their discretion to “seek a balance between allowing ex-offenders to reunite with families that live in HUD subsidized housing, and ensuring the safety of all residents in its programs” (Donovan and Henriquez, 2011: 1). Further, Donovan seeks to reframe the concept of the reentering population, moving from “undeserving” to “deserving” of public support as he noted, “this is an Administration that believes in the importance of second chances—that people who have paid their debt to society deserve the opportunity to become productive citizens and caring parents ... [and] part of that support means helping ex-offenders gain access to ... a place to live” (Donovan and Henriquez, 2011: 2). Our analysis suggests, however, that the current HUD framework using discretion to create balance between safety and access is not necessarily effective. Policymakers may need to consider structural changes to the federal alcohol, drug, and criminal history restrictions and limitations to PHA discretion in favor of clear, equitable policy standards that are transparent and consistent across the housing assistance programs.

Appendix. Public Housing Authorities

Exhibit A-1

Public Housing Authorities

State	Public Housing Authority
Alaska	Alaska Housing Finance Corporation*
Arizona	City of Phoenix Housing Department
California	Housing Authority of the City of Los Angeles
Colorado	Denver Housing Authority
Connecticut	Housing Authority of the City of Bridgeport
Delaware	Delaware State Housing Authority*
Florida	Jacksonville Housing Authority
Georgia	Atlanta Housing Authority
Hawaii	Hawaii Public Housing Authority*
Illinois	Chicago Housing Authority
Indiana	Indianapolis Housing Agency
Iowa	Des Moines Municipal Housing Agency
Kansas	City of Wichita Housing Authority
Louisiana	East Baton Rouge Parish Housing Authority
Maryland	Housing Authority of Baltimore City
Massachusetts	Boston Housing Authority
Michigan	Grand Rapids Housing Commission
Minnesota	Minneapolis Public Housing Authority
Missouri	St. Louis Housing Authority
Montana	Housing Authority of Billings
Nebraska	Omaha Housing Authority
Nevada	Southern Nevada Regional Housing Authority*
New Hampshire	Manchester Housing and Redevelopment Authority
New Jersey	Newark Housing Authority
New Mexico	Albuquerque Housing Authority
New York	New York City Housing Authority
North Carolina	Charlotte Housing Authority
North Dakota	Fargo Housing & Redevelopment Authority
Ohio	Columbus Metropolitan Housing Authority
Oklahoma	Oklahoma City Housing Authority
Oregon	Home Forward (formerly the Housing Authority of Portland)
Pennsylvania	Housing Authority of the City of Pittsburgh
South Carolina	Columbia Housing Authority
South Dakota	Sioux Falls Housing & Redevelopment Commission
Tennessee	Memphis Housing Authority
Texas	Houston Housing Authority
Virginia	City of Virginia Beach Department of Housing and Neighborhood Preservation
Washington	Seattle Housing Authority
West Virginia	Huntington West Virginia Housing Authority
Wisconsin	Housing Authority of the City of Milwaukee

* Single statewide or regional public housing authority.

Acknowledgments

The authors thank Brendan O’Flaherty and Ellen R. DeVoe for helpful discussions and acknowledge the skillful research assistance of Mary Lechner and Angelee Russ. Any remaining errors are those of the authors.

Authors

Marah A. Curtis is an assistant professor at the University of Wisconsin-Madison.

Sarah Garlington is a doctoral candidate at Boston University.

Lisa S. Schottenfeld is a research analyst at Mathematica Policy Research.

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The Role of Supportive Housing in Successful Reentry Outcomes for Disabled Prisoners

Jocelyn Fontaine

Urban Institute

Abstract

This article discusses the impact of a permanent supportive housing reentry program, Returning Home—Ohio, designed and implemented by the Ohio Department of Rehabilitation and Correction and a nonprofit housing advocacy agency. The program provided supportive housing to individuals who had behavioral health disabilities and who had histories of housing instability or were at risk for housing instability as they were released from 13 state prisons to five Ohio cities. Employing a quasi-experimental design with propensity score weights, the evaluation found that the supportive housing program was associated with recidivism reductions—as measured by rearrests and reincarcerations within 1 year of release. Additional analyses focused on the effects on rearrest outcomes of demographic characteristics and aspects of the supportive housing program received. Several demographic variables, including specific mental health disorders, were significantly associated with recidivism. This article discusses the implications of the findings, particularly for reentry and housing practitioners looking to implement similar programming.

Introduction

Various studies have documented the challenges individuals face in attempting to find stable and secure permanent housing on release from prison. Released prisoners have difficulty locating and affording available, independent housing in their communities for myriad reasons, including (1) incomes and work histories insufficient to rent and maintain independent housing, (2) formal policies inhibiting their ability to secure public housing, (3) long waiting lists for public housing, and (4) resistance by landlords to rent to them (see Fontaine and Biess, 2012; Roman and Travis, 2004, for a review). For these reasons, among others, incarceration places individuals at high risk of residential instability on release from prison or jail (Geller and Curtis, 2011)—leading a small share to enter emergency shelters immediately on release (Metraux, Roman, and Cho, 2008; Metraux

and Culhane, 2006, 2004). Residential instability, including homelessness and frequent moves, has also been documented in the months after release from prison, in part because the postrelease housing many former prisoners arrange before release is often only temporary (Visher and Farrell, 2005; Visher, Yahner, and La Vigne, 2010).

Most former prisoners live with family members or friends immediately upon release (La Vigne, Visher, and Castro, 2004; Visher, Baer, and Naser, 2006; Visher and Courtney, 2007; Visher, La Vigne, and Farrell, 2003), which may or may not be suitable to their longer term reentry plans or goals. Indeed, many of the family members with whom former prisoners live struggle with limited incomes and limited employment histories, and they occasionally have their own service needs and criminal justice issues with which to contend (Brooks et al., 2008; Fontaine, Gilchrist-Scott, and Denver, 2011; Visher and Courtney, 2006). Perhaps for these reasons, research shows that many former prisoners would prefer to have their own housing, believing that residential stability and housing will assist them in their reentry goals (Visher and Farrell, 2005). Recent research by Kirk (2012, 2009) suggests that individuals who move away from their former neighborhoods are more successful in refraining from future criminal activity, perhaps because these moves assist individuals in distancing themselves from their former criminogenic environments and networks.

Despite the volume of literature documenting the housing challenge for former prisoners and the potential for independent, permanent housing to reduce criminal activity, scant empirical evidence indicates that permanent housing, in and of itself, leads to better reentry outcomes. Housing theoretically could be used as a platform or pathway toward successful reentry outcomes—including reductions in recidivism, among other outcomes (Fontaine and Biess, 2012). Permanent supportive housing, in particular, could be an effective platform for a subset of individuals released from correctional institutions whom supportive housing models historically have targeted; that is, individuals with histories of or at risk for residential instability (homelessness), mental illnesses, and substance abuse disorders (Burt and Pearson, 2005).

The efficacy of permanent supportive housing for individuals with histories of residential instability and behavioral health issues has been well established in the literature. In particular, several meta-analyses and systematic reviews have concluded that supportive housing significantly improves a range of outcomes for the population with behavioral health issues. It is particularly effective in increasing residential stability, but it also leads to reductions in individuals' use of emergency shelters and emergency medical services and reductions in their length of stay in correctional institutions, such as prisons and jails (see Rog, 2004; Rogers, Kash-MacDonald, and Olschewski, 2009; Miller and Ngugi, 2009). This particular population—those affected by behavioral health issues and histories of residential instability—are disproportionately represented in the correctional population (James and Glaze, 2006; Mellow and Christian, 2008). In summary, it is evident that many of those released from correctional institutions are in need of and would benefit from permanent, independent housing. Permanent supportive housing is an evidence-based program for the population with histories of behavioral health issues and residential instability—a population that is, unfortunately, well represented in the population released from prison.

Using data from a multiyear evaluation, recently completed by the Urban Institute,¹ of the process, impact, and cost of a program called Returning Home—Ohio (RHO), this article adds to the extant literature in two primary ways. First, this article includes impact evaluation findings of a supportive housing program designed specifically for individuals released from state prison to the community. The findings demonstrate the ways in which (permanent supportive) housing can be a pathway toward successful reentry, focusing on rearrest and reincarceration outcomes. Second, because of the significant variation evident in the supportive housing program and in the population it served by design, the article includes findings on the relationship between some of the supportive housing components received and the population served to understand which were associated with recidivism. The first half of this study is notably grounded in the relatively robust empirical literature on the efficacy of permanent supportive housing models, whereas the second half is distinctly exploratory. Indeed, scant empirical literature “unbundles” what is most effective about supportive housing models (Osher and Steadman, 2007), and only limited evidence suggests who benefits the most (Rog, 2004; Rogers, Kash-MacDonald, and Olschewski, 2009).

This article begins with a further review of the literature on supportive housing and its role in reentry, providing context for the current study. After this review, it outlines the supportive housing program that was evaluated and highlights key aspects of the pilot program. The article then discusses the methods and data sources used to understand the effect of the pilot on recidivism and the relationship among participant characteristics, supportive housing, and recidivism. It then presents the findings for each component of the study in detail, including a summary of the main limitations of the findings. Finally, the article addresses the implications of the findings—particularly, for the field of reentry and housing practitioners and policymakers looking to implement similar programming for the reentry population.

Research Supporting the Efficacy of Supportive Housing for the Reentry Population

In general, supportive housing is the combination of affordable housing with supportive services that can include coordinated case management; health, mental health, and substance abuse treatment services; educational services; and vocational training and employment services. Supportive housing services are tailored by provider and intended to vary depending on participants' need of services and risk for residential instability (Rogers, Kash-MacDonald, and Olschewski, 2009). Supportive housing has been used to assist in the residential stability of the population at risk of homelessness and of those with histories of homelessness, mental health illnesses, or substance use illnesses (Burt and Pearson, 2005). Rates of housing retention have been high among various populations provided supportive housing, including those with severe mental illnesses, co-occurring mental illness and substance abuse diagnoses, and those who are chronically homeless (Martinez and Burt, 2006; Wong et al., 2006).

¹ For more information about the housing pilot and evaluation, see Fontaine et al. (2012).

Studies and meta-analyses have consistently shown that supportive housing is effective, particularly in its ability to keep individuals residentially stable over time (Hurlburt, Hough, and Wood, 1996; Leff et al., 2009; Miller and Ngugi, 2009; Newman et al., 1996; Rog, 2004; Rogers, Kash-MacDonald, and Olschewski, 2009). Many supportive housing models are based on a “housing first” approach, an approach that emphasizes housing stabilization and harm reduction, wherein continued tenancy is not dependent on participation in services or maintaining abstinence (see NAEH, 2006; HUD-PD&R, 2007). As a result, the residential stability offered through supportive housing has also been associated with reductions in the use of and length of stay in other institutional settings, such as emergency treatment facilities, emergency hospitals, and correctional institutions (Rog, 2004; Rogers, Kash-MacDonald, and Olschewski, 2009). That is, individuals’ use of other, often costly, public services declines after they become residentially stable in supportive housing (see Culhane, Metraux, and Hadley, 2002).

Very little research, however, has explored the specific aspects of the supportive housing that could be related to positive outcomes or the extent to which supportive housing is more effective than other housing models (for example, transitional housing or affordable housing models). The research demonstrates that supportive housing is more effective than no housing or nonmodel housing and that housing with more defined services may be more effective (Leff et al., 2009; Rog, 2004), but research on the components of effective supportive housing models is mostly missing in the literature. After their review of the extant literature at the time, Osher and Steadman (2007) argued that supportive housing has the potential to achieve significant behavioral health and public safety outcomes for the population with mental illnesses, yet no single model or package of services has emerged specifically for housing those with mental illnesses in the criminal justice system. Osher, Steadman, and Barr (2003) previously argued for the best-practice model called APIC (assessment, planning, identifying, and coordination), currently used for severely mentally ill patients in the community, to be expanded to that same population released from correctional institutions.

In addition to the different aspects of the service components, many aspects of the housing could be related to outcomes, including the characteristics of the specific housing unit, its affordability and quality, and its location (Fontaine and Biess, 2012). For the population returning from prison, the location of the housing unit may be critical if it offers returning prisoners greater access to employment opportunities, for example. On the other hand, as Kirk (2012, 2009) suggested, the location of the housing unit could be critical if it affords former prisoners the ability to distance themselves from former criminogenic networks.

Further, little is known on the effectiveness of supportive housing for the reentry population specifically. Although supportive housing has been found effective for the population with behavioral health disorders, and although a disproportionate number of individuals released from correctional institutions have behavioral health histories (James and Glaze, 2006), we know relatively little about supportive housing for those released directly from prisons and jails. A meta-analysis by the Washington State Institute for Public Policy concluded that the relative effect of housing and housing supports for the reentry population cannot yet be fully understood, given that housing and housing support services are commonly bundled with other services as part of more comprehensive reentry programs that typically serve a general population of formerly incarcerated people (Miller and Ngugi, 2009).

Housing theoretically could be a critical component of the reentry and reintegration process for formerly incarcerated people (Fontaine and Biess, 2012). For the population with or without behavioral health challenges, incarceration places individuals at immediate risk of residential instability on release (Geller and Curtis, 2011; Metraux and Culhane, 2006, 2004; Metraux, Roman, and Cho, 2008). Many former prisoners return to the community with only temporary housing arrangements (Visher and Farrell, 2005). For former prisoners, in particular, housing instability is a barrier to sustained employment and family reunification or support (Graffam et al., 2004; Roman and Travis, 2004), each of which has been associated with recidivism. Based on the literature, we expected that RHO would significantly reduce recidivism given the strong evidence base on supportive housing models and that RHO intentionally recruited the population expected to benefit most from supportive housing in the institutions. Furthermore, RHO included several hallmarks of successful reentry programming, including prerelease reentry planning and assessment of risk and needs, transitional services that continued from prison to the community, and the provision of services for an extended period of time (Petersilia, 2004; Visher and Travis, 2011).

Overview of the Permanent Supportive Housing Program

RHO was a joint venture of the Ohio prison system, the Ohio Department of Rehabilitation and Correction (ODRC), and a housing advocacy agency, the Corporation for Supportive Housing (CSH), whose mission is to support housing as a platform for vulnerable populations. The program was funded mostly by ODRC. ODRC and CSH planned and implemented the supportive housing pilot program—designed for individuals who had a disability, broadly defined, and who either had a history of, or were at risk for, homelessness on release—in 13 Ohio prisons in late 2006 and early 2007. The pilot provided prerelease reentry planning and postrelease housing and supports in five cities across the state with one of nine supportive housing providers associated with the pilot. One of the primary goals of the pilot was to reduce recidivism and residential instability under the logic that the provision of supportive housing to individuals as they were released from prison was a way to break costly cycles of system use and increase public safety and public health.

Whereas institutional staff determined eligibility for the pilot (disabilities and history of homelessness or risk of homelessness on release), the nine community-based providers associated with RHO made the final decision to enroll and house eligible prisoners after release. The RHO supportive housing providers varied—some had experience providing housing supports for the indigent population primarily, whereas others were more experienced working with individuals with severe mental illnesses or histories of trauma. Some providers had a history of employing a scattered-site housing model with private landlords, whereas others owned or managed a single affordable housing property where RHO participants were housed in units among non-RHO participants. The variation in the housing and support services offered was purposeful; ODRC and CSH recruited a diverse group of experienced housing providers to match the diverse eligible pilot population. Each provider managed its own implementation of supportive housing to its participants using the experience it had in implementing supportive housing before RHO.

Enrollment in the pilot proceeded in four steps: (1) prerelease identification by institutional staff in the 13 Ohio prisons; (2) prerelease referral to one of the housing providers associated with the pilot;

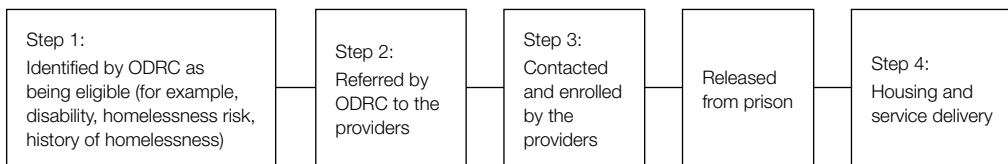
(3) prerelease contact and enrollment (in person or by teleconference) by one of the housing providers associated with the pilot—which included the development of a reentry plan that included postrelease housing and supportive services, as needed, for those accepted into the program by the provider; and (4) postrelease housing and supportive services with the provider in one of the five cities—either scattered-site housing with a private landlord or single-site housing managed or owned by one of the pilot-associated providers. Exhibit 1 shows the ideal pathway into the program through these four steps.

In practice, however, significant variation occurred, and RHO participants had three primary pathways into the program. Among the RHO participants, 45 percent had the ideal pathway to housing—that is, they were identified by the prison as eligible, referred to a provider, and subsequently enrolled into the pilot before release. The remainder of RHO participants (55 percent) followed a less than ideal pathway into the program. Some (18 percent) were identified and referred prerelease but enrolled into the program by the provider after release. Others (17 percent) were identified, referred, and enrolled after release. The remaining 20 percent did not fall into any of these primary pathways due to missing provider data, out of order pathways (for example, contact and enrollment occurred before ODRC referral), or inconsistent dates of provider enrollment (for example, contact and enrollment occurred at different dates). Additional variation was evident in the actual receipt of supportive housing in the community. For some individuals, housing occurred immediately upon their release from the institution, whereas others were in the community for several weeks or months before receiving supportive housing. The variation in the pathways to housing was due to (1) inherent challenges in facilitating the reentry process before release, (2) the type and availability of housing offered by the community-based providers, and (3) the number of stakeholders involved in the identification and enrollment process. Prerelease recruitment was a critical goal for this pilot because the months immediately after release are known to be critical periods for the reentry population generally (Langan and Levin, 2002)—particularly for a population that has a history of, and is at risk for, residential instability.

Despite the variability in the pathways into the program, over a period of approximately 2 years, the program housed more than 100 individuals in the community. In addition to receiving the housing, individuals received a host of supportive services in the community, including mental health services, such as medication and therapy; substance abuse services, such as Alcoholics Anonymous; and other supportive services offered by the providers directly or through referrals to other agencies. Unfortunately, the evaluation was able to collect only limited systematic information on the providers’ services across all the pilot participants to understand the direct effect of

Exhibit 1

Ideal Pathway Into the RHO Program



ODRC = Ohio Department of Rehabilitation and Correction. RHO = Returning Home—Ohio.

Source: Urban Institute analysis of discussions with stakeholders from ODRC, the Corporation for Supportive Housing, and the RHO supportive housing providers

provider services on outcomes. Further, the provision of services was guided primarily by whether the individual needed more (or fewer) services, and only one provider required services as a condition of program enrollment. As shown in the following section, the population recruited into RHO also varied on the program eligibility criteria and other demographics, suggesting that a range of different service options was needed.

Because of the variation found in the pathways into the program and the variation in the housing offered (single or scattered-site housing providers), a secondary goal of the study was to identify whether these two core objective measures of the program were related to outcomes. As mentioned, the moment of release is a critical period and the variation in the pathways to the RHO program theoretically could be related to outcomes. For example, individuals who experienced the ideal pathway received additional provider services given their prerelease enrollment as compared to those who did not experience prerelease enrollment. The different housing models the providers employed are also a rough proxy for the different services to which individuals were exposed. For example, the single-site housing models used in the RHO program had onsite staff who could monitor RHO (and other) residents, whereas RHO participants in the scattered-site housing models had more independence. In another example, the scattered-site housing providers needed approval from private landlords to house individuals—which would have been easier to receive for some participants rather than others. The single-site housing providers, however, did not have to overcome this additional barrier.

Therefore, after exploring the program's overall impact on recidivism, the study focuses on what characteristics of the treatment group were related to recidivism and whether pathways into the program and housing type were related to recidivism. The variation in the eligible population, provider experiences, and services required ODRC, CSH, and the providers to work collaboratively to identify and match the “right” population of eligible prisoners to the “right” provider.² Although the variation evidenced in RHO is a reflection of the variety built into supportive housing programs more generally, it provided an opportunity to explore whether that variety was related to outcomes.

Methods—Sample, Data Collection, and Analysis Strategy

Using a quasi-experimental design, the impact evaluation focused on a prospective cohort of prisoners released from the pilot prisons during the pilot's implementation period (2007 to 2009). The evaluation compared individuals receiving supportive housing through the pilot with a contemporaneous cohort of individuals released from the target prisons deemed eligible for the pilot but not housed. The pilot offered fewer units than could house the number of individuals assumed to be eligible. The study requested consents from every individual interested in the pilot program and collected data from only those individuals from whom the research team received signed consents.³ Enrollment into the study yielded a total sample of 244 individuals, 121 of whom were provided housing

² More information is available in the full report on the process evaluation of the program (Fontaine et al., 2012).

³ Participation in the research study was not a condition of participation in the program. Therefore, the findings are limited to the sample from which the Urban Institute received a signed consent. Our analyses suggest that very few individuals served by the pilot did not consent to participate in the study.

through the pilot. Data were collected from ODRC for 239 of the 244 consenting individuals, including 121 RHO participants (treatment) and 118 comparison group participants. In addition to collecting data on individuals' basic demographic characteristics, including age, race/ethnicity, and gender, data on time served in instant incarceration (*time served*), ODRC incarceration histories (*previous incarcerations*), security level and release risk as classified by ODRC (*security level and release risk level*), homelessness status at arrest (*recent homelessness*), primary disability classifications and diagnoses (*mental health or alcohol or drug abuse*), medical status (*medical status*), and postrelease supervision status (*postrelease supervision*).

Enrollment in the study took 2 years for several reasons, chiefly the initial implementation challenges that slowed enrollment into the RHO program. Comparison group enrollment was skewed toward the latter months of the study enrollment period. Funding constraints required us to focus only on 1-year outcomes. We collected information on 1-year rearrest incidents for any crime, including felonies and misdemeanors, and 1-year reincarceration incidents for any reason, including community supervision violations and new crimes. Exhibit 2 shows select demographic, incarceration, and program characteristics of the individuals in the sample, including those housed and not housed by the pilot, based on data collected from ODRC.

As shown in exhibit 2, there were significant differences in the sample groups with respect to their racial /ethnic breakdown, prison security level, and alcohol or drug abuse disability. Statistically non-significant, yet notable percentage differences were observed between the two groups on their time served in prison⁴ and the percentage who were recently homeless. Taken together, the differences in these demographic, incarceration, and program characteristics suggest that the treatment group may have been at a slightly greater risk of rearrest and reincarceration upon release than the comparison group. Exhibit 2 shows, however, that the 1-year rearrest and reincarceration outcomes are significantly different on two of the six recidivism measures estimated—with the treatment group having better outcomes. The comparison group had a higher rate of total rearrests and rearrests for misdemeanors. Although the comparison group was also reincarcerated at a higher rate than the treatment group, tests of statistical differences for total reincarcerations, new crimes, and technical violations between the two groups was not significant at or below the .10 level of significance.

In addition to the significant differences between the treatment and comparison groups on some of the demographic, incarceration, and program-eligibility variables, additional statistical tests confirmed that several demographic variables were associated with group assignment. A logistic regression predicting assignment into the treatment group showed that race/ethnicity, primary disability, recent homelessness, and security level increased the probability that an individual was placed into the treatment group.⁵ Therefore, we used inverse propensity score weights in our regression models, given that the potentially biased process used to select program participants could be related to outcomes—as evidenced by the regression model predicting group assignment and discussions with stakeholders on how participants were enrolled into the program.

⁴ The *time served* variable is notably short, particularly for RHO participants. This short time is because several RHO participants were recruited into the program while serving a sentence for a postrelease violation. Furthermore, stakeholders from ODRC indicated that RHO was used as a viable way to house individuals deemed “hard to house.”

⁵ Results are available from the author on request.

Exhibit 2

Select Demographic, Incarceration, and Program Characteristics and 1-Year Recidivism Outcomes of Sample Groups

	Treatment— RHO Participant	Comparison	Significance Level
Male (percent)	76.9	78.8	—
White (percent)	40.5	60.2	.01
Age at release (years)	41.6	42.4	—
Time served (days)	907.4	1,289.7	—
Previous incarcerations	1.8	1.6	—
Security level ^a	2.61	2.43	.05
Release risk level ^b	1.18	1.18	—
Postrelease supervision (percent)	50.4	53.0	—
Recent homelessness (percent)	23.1	14.9	—
Primary disability—MH (percent)	62.8	65.4	—
Primary disability—AOD (percent)	31.4	20.6	.01
Medical status ^c	1.62	1.50	—
Any rearrest (percent)	27.3	37.3	.05
Rearrest—felony (percent)	18.2	17.8	—
Rearrest—misdemeanor (percent)	18.2	27.1	.05
Any reincarceration (percent)	6.6	11.0	—
Reincarceration—new crime (percent)	5.8	8.5	—
Reincarceration—technical violation (percent)	0.8	2.5	—

AOD = alcohol or other drug use. MH = mental health. RHO = Returning Home—Ohio.

^a Security level ranges from 1 to 5, from low- to high-security level.

^b Release risk level ranges from -1 to 8, from low or basic risk to high or intensive risk.

^c Medical status ranges from 1 to 4, from regular checkups to intensive care required.

Notes: Various statistical tests of differences in the means of the treatment group and the comparison group tested whether the differences were significantly different from 0: $p < .10$, $p < .05$, and $p < .01$. Valid N = 121 treatment-group participants, 118 comparison-group participants.

Source: Urban Institute analysis of data from the Ohio Department of Rehabilitation and Correction

Findings—Impact of RHO on Recidivism

Exhibit 3 shows the three weighted logistic regression models on any rearrest (within 1 year) and three weighted logistic regression models on any reincarceration (within 1 year). All the models for the logistic regression of any rearrest and any reincarceration include the propensity weights and covariates. The final models (model 1.3 and 2.3) that have the propensity weights and the most covariates show that placement into the treatment group is associated with statistically significant recidivism reductions. We decided to include the weights and the covariates, or doubly robust models, to reduce bias to the greatest extent possible. Although including covariates and propensity weights in regression models trades precision in the estimates for reduced error, we preferred to use the doubly robust models to get the best sense of the impact of RHO on recidivism (see Funk et al., 2011). In addition, correlations of all the covariates in the final models (model 1.3 and 2.3) were not heavily collinear,⁶ which suggests that each final model provides the least biased estimate of the impact of the program on outcomes.

⁶ Results are available from the author on request.

Exhibit 3

Logistic Regression of Any Rearrest or Reincarceration Within 1 Year After Release (1 of 2)

	Any Rearrest Within 1 Year After Release (model number)			Any Reincarceration Within 1 Year After Release (model number)		
	1.1	1.2	1.3	2.1	2.2	2.3
RHO treatment	- 0.660** (0.295)	- 0.809** (0.316)	- 0.852*** (0.322)	- 0.611 (0.510)	- 0.907 (0.605)	- 1.404* (0.724)
Age at release	- 0.023 (0.018)	- 0.028 (0.021)	- 0.039** (0.021)	- 0.007 (0.028)	- 0.013 (0.035)	- 0.012 (0.043)
Race/ethnicity—White	- 0.015 (0.298)	- 0.189 (0.342)	- 0.183 (0.352)	- 0.906* (0.535)	- 1.181* (0.673)	- 1.114 (0.765)
Gender—male	0.123 (0.374)	0.122 (0.404)	- 0.361 (0.441)	0.649 (0.781)	0.715 (0.878)	0.073 (1.043)
MH disability	0.187 (0.620)	0.042 (0.633)	0.167 (0.719)	0.228 (0.963)	0.111 (1.094)	0.073 (1.405)
AOD disability	0.107 (0.630)	- 0.160 (0.669)	- 0.341 (0.672)	- 1.129 (1.127)	- 1.027 (1.247)	- 1.475 (1.439)
Primary disability—MH and primary disability—AOD	- 0.119 (0.723)	- 0.039 (0.770)	0.005 (0.781)	0.906 (1.253)	0.580 (1.403)	1.533 (1.681)
Security level	0.231 (0.210)	0.306 (0.248)	0.212 (0.260)	0.623* (0.342)	0.530 (0.424)	0.526 (0.523)
Recent homelessness	—	0.411 (0.476)	0.023 (0.464)	—	1.260 (0.800)	0.979 (0.863)
Previous incarcerations	—	0.312*** (0.096)	0.386*** (0.098)	—	0.222 (0.146)	0.353** (0.166)
Time served	—	< 0.000 (< 0.000)	—	—	< 0.000 (< 0.000)	—
Postrelease supervision	—	0.169 (0.369)	0.003 (0.366)	—	0.861 (0.677)	0.487 (0.740)
Release risk level	—	- 0.375 (0.443)	- 0.249 (0.444)	—	1.573** (0.617)	1.789*** (0.692)
Medical status	—	—	- 0.402 (0.337)	—	—	1.293* (0.725)
Psychotic MH disorder	—	—	- 0.852* (0.469)	—	—	- 0.243 (0.794)
Substance use MH disorder	—	—	0.531 (0.434)	—	—	0.010 (0.930)
Personality MH disorder	—	—	0.529 (0.433)	—	—	0.775 (0.812)
Mood MH disorder	—	—	- 0.327 (0.395)	—	—	1.014 (0.757)
Anxiety MH disorder	—	—	- 0.147 (0.369)	—	—	- 2.723*** (1.001)

Exhibit 3

Logistic Regression of Any Rearrest or Reincarceration Within 1 Year After Release (2 of 2)

	Any Rearrest Within 1 Year After Release (model number)			Any Reincarceration Within 1 Year After Release (model number)		
	1.1	1.2	1.3	2.1	2.2	2.3
Other MH disorder	—	—	0.273 (0.649)	—	—	1.040 (1.063)
AIC	290.45	274.93	286.55	137.08	124.26	122.02
N	223	223	223	223	223	223

AIC = Akaike Information Criteria. AOD = alcohol or other drug use. MH = mental health. RHO = Returning Home—Ohio.

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

Notes: Each column reports selected coefficients from a logistic regression that includes inverse propensity score weights.

The treatment coefficient is the expected change in the odds of any rearrest or reincarceration from being placed in the treatment group as opposed to being placed in the comparison group. Positive values indicate that the treatment group is more likely to be rearrested or reincarcerated than the comparison group; negative values indicate that the treatment group is less likely to be rearrested or reincarcerated than the comparison group.

Source: Urban Institute analysis of data from the Ohio Department of Rehabilitation and Correction

According to the final models, 1.3 and 2.3, receipt of supportive housing through the RHO program was associated with a reduced probability of rearrest and reincarceration. Specifically, RHO participants were 40 percent less likely to be rearrested within 1 year and 61 percent less likely to be reincarcerated within 1 year compared with the rates for the comparison group. A logistic regression on the felony rearrests (within 1 year) and misdemeanor rearrests (within 1 year), which similarly included the propensity weights and all the covariates, showed that RHO participants were significantly less likely to be rearrested for misdemeanors only (43 percent less likely). The logistic regression showed that RHO participation was not associated with significant reductions in felony rearrests. Models estimating the impact of RHO participation on reincarceration rates for new crimes did not show a significant effect for the RHO treatment variable and models estimating RHO’s effect on technical violations was not estimated given the few observations.⁷

In addition to the significant impact of RHO participation on rearrests, rearrest outcomes were also significantly associated with some of the covariates. Specifically, being younger, having more previous incarcerations, and having no diagnosis of a psychotic disorder were associated with a significantly greater likelihood of rearrest within 1 year of release from prison (exhibit 3, column 1.3). Regarding the reincarceration model, in addition to RHO participation, previous incarcerations, release risk, medical status, and anxiety disorder diagnosis were significantly associated with reincarceration outcomes. Specifically, having more previous incarcerations, a higher release risk, a lower medical status (denotes receiving less medical care in prison), and no diagnosis of an anxiety disorder were associated with a significantly greater likelihood of reincarceration within 1 year of release. The significant relationship between release risk and reincarceration is notable, given that this variable is ODRC’s measure of an inmate’s likelihood of reincarceration (exhibit 3, column 2.3).

⁷ Results are available from the author on request.

Aside from the significant findings of program effects that have implications for the reentry housing field (discussed in a subsequent section), the findings of RHO's impact on recidivism is notable for two methodological reasons. First, given the 1-year followup period, the study may have underestimated the program's full benefits. Recall that several RHO participants were not housed with the program until several weeks (or months) after their release from prison, and others were not contacted by the program at all until weeks or months after their release from prison. Although every RHO participant received housing in the 1-year followup period, RHO demonstrated significant impact given the small dosage (of housing) that some participants actually received. Second, as discussed in the review of the housing program, significant variation was built into the program by design. The program participants varied (on homelessness and disability), and the housing support services varied, including the participants' pathway into the program. Some of the variation was likely related to better (or worse) outcomes, yet, the impact evaluation includes the entire cohort of RHO participants, including those with better (or worse) outcomes. Stated differently, bias in the RHO treatment variable that is not modeled in the logistic regressions just described. Therefore, to explore whether some participant characteristics and program components were related to better (or worse) outcomes, the second half of this study focuses exclusively on the treatment group.

First, we explored whether the treatment group that was rearrested was significantly different from the treatment group that was not rearrested. The decision to focus only on rearrests was because of the few observed reincarcerations among the treatment group during the study period. Next, we explored whether program eligibility criteria were related to the two core program components outlined—pathway into the program and scattered-site housing provider. Last, we explored whether all these measures were related to rearrest outcomes.

Findings—Effect of Demographics and Program Components on Recidivism

Despite the relatively small sample of program participants with full data ($N = 118$), several significant differences were observed between the not-rearrested group and the rearrested group. As displayed in exhibit 4, the group rearrested 1 year after release comprised significantly more males, more non-Whites, and more of those with more previous incarcerations. In addition, the rearrested group also comprised significantly more individuals who had served less time in their most recent incarceration and were not under postrelease supervision. Regarding the program-specific eligibility criteria, exhibit 4 shows that the group that was rearrested comprised significantly fewer individuals who were homeless at arrest (of the instant incarceration that got them into RHO) and fewer who had mental illness as their primary disability. The rearrested group had significantly lower medical statuses (meaning they were receiving fewer medical services in prison). The rearrested group also comprised significantly more individuals diagnosed with a substance abuse mental health or personality disorder. Taken together, the significant differences between the group on homelessness at arrest and disabilities may be an indication that the RHO program is working well for those for whom supportive housing has been shown to be most effective. Finally, of the two variables related to the program services, the rearrested group comprised fewer individuals who experienced the ideal pathway into the program (the variable is marginally significant)—that is, fewer individuals whose pathway into RHO included prerelease identification by ODRC and prerelease enrollment by a provider.

Exhibit 4

Differences in 1-Year Rearrest Outcomes, by RHO Participants' Demographic, Incarceration, and Program Characteristics

	Not Rearrested	Rearrested	Significance Level
Male (percent)	74.4	87.5	.10
White (percent)	47.7	25.0	.05
Age at release (years)	41.6	41.8	—
Time served (days)	1,051.3	358.1	.05
Previous incarcerations (percent)	1.17	3.42	.01
Security level (percent) ^a	2.61	2.68	—
Release risk level (percent) ^b	1.15	1.23	—
Postrelease supervision (percent)	58.1	28.1	.01
Recent homelessness (percent)	27.9	9.38	.01
Disability ^c —MH (percent)	70.9	56.3	.10
Disability ^c —AOD (percent)	72.1	71.8	—
Medical status ^d	1.55	1.34	.05
Psychotic MH diagnosis ^e (percent)	26.7	31.3	—
Substance use MH diagnosis ^e (percent)	45.3	62.5	.05
Personality MH diagnosis ^e (percent)	15.1	37.5	.01
Mood disorder MH diagnosis ^e (percent)	47.7	43.8	—
Anxiety MH diagnosis ^e (percent)	36.0	25.0	—
Other MH diagnosis ^{e,f} (percent)	5.81	12.50	—
Ideal pathway to program (percent)	50.6	37.5	.10
Scattered-site housing provider (percent)	51.2	43.8	—

AOD = alcohol or other drug use. MH = mental health. RHO = Returning Home—Ohio.

^a Security level ranges from 1 to 5, from low- to high-security level.

^b Release risk level ranges from -1 to 8, from low or basic risk to high or intensive risk.

^c Disability could be primary or secondary.

^d Medical status ranges from 1 to 4, from regular checkups to intensive care required.

^e Psychotic, substance use, personality, mood, and anxiety disorders are Axis I or Axis II MH classifications.

^f Other MH diagnosis includes mental retardation and developmental disabilities and attention deficit hyperactive disorder, among others.

Notes: Various statistical tests of differences in the means of the treatment group and the comparison group tested whether the differences were significantly different from 0: $p < .10$; $p < .05$; $p < 0.01$. $N = 118$ (treatment group/RHO participants only).

Source: Urban Institute analysis of data from the Ohio Department of Rehabilitation and Correction

Given the findings of significant differences between the not-rearrested and arrested groups along several program-specific variables (for example, homelessness, disability, and ideal pathway), we analyzed several two-way interactions using chi-square tests to further explore their relationship to recidivism. Exhibit 5 shows the interaction between the ideal pathway and recent homelessness, mental health disability, and alcohol or drug use disability and its relationship to rearrests. Exhibit 6 similarly shows the interaction between scattered-site housing provider and the same three demographics and its relationship to rearrests. Of the six interactions estimated, only one is statistically significant: the interaction between recent homelessness and ideal pathway. None of the interactions between scattered-site housing provider and homelessness or disability were significant at or below the .10 level of significance. A relationship appears to exist between recent homelessness and ideal pathway; the distribution of rearrests along the continuum of these two variables is significantly different from the distribution that would be expected if there was no

Exhibit 5

Interaction Between Select Eligibility Criteria, Ideal Program Pathway, and Recidivism

Recent Homelessness* + Ideal Pathway			
	Not Arrested	Arrested	Total
0: not homeless, not ideal pathway.	31 (62.0%)	19 (38.0%)	50
1: not homeless, ideal pathway.	30 (75.0%)	10 (25.0%)	40
2: homeless, not ideal pathway.	11 (91.7%)	1 (8.3%)	12
3: homeless, ideal pathway.	13 (86.7%)	2 (13.3%)	15
Total	85	32	117

MH Disability + Ideal Pathway			
	Not Arrested	Arrested	Total
0: no MH disability, not ideal pathway.	12 (57.1%)	9 (42.9%)	21
1: no MH disability, ideal pathway.	13 (72.2%)	5 (27.8%)	18
2: MH disability, not ideal pathway.	30 (73.2%)	11 (26.8%)	41
3: MH disability, ideal pathway.	30 (81.1%)	7 (18.9%)	37
Total	85	32	117

AOD Disability + Ideal Pathway			
	Not Arrested	Arrested	Total
0: no AOD disability, not ideal pathway.	12 (66.7%)	6 (33.3%)	18
1: no AOD disability, ideal pathway.	12 (80.0%)	3 (20.0%)	15
2: AOD disability, not ideal pathway.	30 (68.2%)	14 (31.8%)	44
3: AOD disability, ideal pathway.	31 (77.5%)	9 (22.5%)	40
Total	85	32	117

AOD = alcohol or other drug use. MH = mental health.

* $p = .10$.

Note: Chi-square significance testing tested whether the observed distribution differed from the expected distribution of no relationship between eligibility criteria, ideal pathway, and rearrest. Numbers in parentheses indicate the percentage of the total that fell into each group.

Source: Urban Institute analysis of data from the Ohio Department of Rehabilitation and Correction and the Returning Home—Ohio housing providers

significant relationship between these variables. The significant interaction suggests that the ideal pathway into the program may have been particularly beneficial to individuals with recent homelessness experiences.

The lack of significance for the other two-way interactions indicates that entering the program through the ideal pathway does not appear particularly beneficial, in terms of rearrest outcomes,

Exhibit 6

Relationship Between Select Eligibility Criteria, Scattered-Site Housing Provider, and Recidivism

Recent Homelessness + Scattered-Site Provider			
	Not Arrested	Arrested	Total
0: not homeless, not scattered-site provider.	36 (69.2%)	16 (30.8%)	52
1: not homeless, scattered-site provider.	26 (66.7%)	13 (33.3%)	39
2: homeless, not scattered-site provider.	6 (75.0%)	2 (25.0%)	8
3: homeless, scattered-site provider.	18 (94.7%)	1 (5.3%)	19
Total	86	32	118

MH Disability + Scattered-Site Provider			
	Not Arrested	Arrested	Total
0: no MH disability, not scattered-site provider.	15 (60.0%)	10 (40.0%)	25
1: no MH disability, scattered-site provider.	10 (71.4%)	4 (28.6%)	14
2: MH disability, not scattered-site provider.	27 (77.1%)	8 (22.9%)	35
3: MH disability, scattered-site provider.	34 (77.3%)	10 (22.7%)	44
Total	86	32	118

AOD Disability + Scattered-Site Provider			
	Not Arrested	Arrested	Total
0: no AOD disability, not scattered-site provider.	11 (73.3%)	4 (26.7%)	15
1: no AOD disability, scattered-site provider.	13 (72.2%)	5 (27.8%)	18
2: AOD disability, not scattered-site provider.	31 (68.9%)	14 (31.1%)	45
3: AOD disability, scattered-site provider.	31 (77.5%)	9 (22.5%)	40
Total	86	32	118

AOD = alcohol or other drug use. MH = mental health.

Note: Chi-square significance testing tested whether the observed distribution differed from the expected distribution of no relationship between eligibility criteria, scattered-site housing provider, and rearrest. Numbers in parentheses indicate the percentage of the total that fell into each group.

Source: Urban Institute analysis of data from the Ohio Department of Rehabilitation and Correction and the Returning Home—Ohio housing providers

for individuals with mental health and alcohol and other drug disabilities. This lack of significance alternatively suggests that, although the ideal pathway appears to be beneficial for the entire RHO group (as evidenced in exhibit 4), its benefits were independent of the mental health or alcohol and drug disability status of those in the program. The nonsignificant findings on any of the interactions between disability or recent homelessness and scattered-site housing provider also seem to

suggest that those served by a scattered-site housing provider with either a mental health disability, alcohol or other drug disability, or recent homelessness did not experience significantly different outcomes than those served by the single-site housing providers. Notable, however, are the relatively few observations within each of these interactions; therefore, the lack of significant findings could be the result of the small sample size.

A logistic regression estimating the effect of RHO participants' demographic characteristics and core program components received is estimated in exhibit 7. Several different models were estimated with different covariates to reduce collinearity in the estimates and to determine the best fit to the data. Specifically, release risk was highly correlated to security level and previous incarcerations. Different covariates were significant in different models, but several variables appear to have a robust relationship to rearrest outcomes among RHO participants. Previous incarceration is notably significant in every model estimated with this variable—RHO participants with more previous incarcerations were significantly more likely to be rearrested than those with fewer previous incarcerations. When this variable is removed, other covariates become significant, suggesting that this variable—although not highly collinear with any other variable except release risk—has much explanatory power in the data. According to the Aikaka Information Criteria, wherein lower numbers imply better goodness of fit, model 1.4 and model 1.5 appear to be the best fit for the data (both include the previous incarcerations variable). Postprediction analyses show that these two models also reduce classification error by more than one-half. It is notable that neither of these models includes the two core program component variables: scattered-site housing provider and ideal pathway. Models 1.4 and 1.5 show that certain mental health disorders are significantly related to recidivism. Substance abuse mental health disorder and personality mental health disorder are each associated with a significantly greater probability of rearrests in the data, whereas psychotic disorder and anxiety disorder (in one of these two models) are each associated with a significantly lower probability of rearrests. Lower medical status is also associated with a significantly lower probability of rearrests in one of the two best fitting models. The significance of the independent mental health diagnoses variables is evident with or without the inclusion of the alcohol or other drug disability and mental health disability variables (these results are not shown).

Exhibit 7

Logistic Regression of Any Rearrest Within 1 Year After Release Among RHO Participants (1 of 2)

	(1.1)	(1.2)	(1.3)	(1.4)	(1.5)	(1.6)	(1.7)	(1.8)
Age at release	- 0.010 (0.026)	- 0.012 (0.026)	- 0.018 (0.035)	0.030 (0.044)	0.026 (0.045)	- 0.045 (0.040)	- 0.024 (0.043)	0.012 (0.048)
Race/ethnicity— White	- 0.996** (0.490)	- 1.061** (0.482)	- 0.801 (0.580)	- 0.836 (0.720)	- 0.798 (0.729)	- 1.151* (0.691)	- 0.793 (0.730)	- 1.718 (0.736)
Gender—male	1.031 (0.653)	0.882 (0.634)	1.399* (0.789)	0.519 (1.061)	0.331 (1.007)	1.249 (0.968)	0.515 (1.071)	0.699 (1.090)
MH disability	- 2.479* (1.288)	- 0.667 (0.474)	- 1.070 (1.467)	- 2.407 (1.926)	- 2.315 (1.935)	- 2.769* (1.599)	- 2.380 (1.908)	- 2.248 (1.908)
AOD disability	- 1.965 (1.253)	- 0.255 (0.517)	- 1.232 (1.380)	- 2.362 (1.658)	- 2.514 (1.629)	- 2.040 (1.392)	- 2.337 (1.635)	- 2.410 (1.683)

Exhibit 7

Logistic Regression of Any Rearrest Within 1 Year After Release Among RHO Participants (2 of 2)

	(1.1)	(1.2)	(1.3)	(1.4)	(1.5)	(1.6)	(1.7)	(1.8)
MH and AOD disability	2.181 (1.340)	—	1.130 (1.589)	2.893 (2.011)	2.986 (1.992)	2.582 (1.735)	2.840 (1.991)	-2.838 (2.022)
Security level	0.097 (0.323)	0.124 (0.316)	0.154 (0.457)	—	-0.219 (0.572)	0.185 (0.497)	-0.223 (0.562)	-0.269 (0.563)
Recent homelessness	—	—	-0.413 (0.840)	-0.601 (1.071)	-0.610 (1.111)	-0.720 (0.977)	-0.482 (1.120)	-0.547 (1.129)
Previous incarcerations	—	—	0.464*** (0.155)	0.510*** (0.196)	0.584*** (0.189)	—	0.531** (0.208)	0.526** (0.214)
Time served	—	—	-0.002 (0.001)	-0.001 (< 0.001)	-0.001 (0.001)	-0.001** (< 0.001)	-0.001 (0.001)	-0.002 (0.001)
Postrelease supervision	—	—	-0.742 (0.636)	-1.109 (0.764)	-0.937 (0.751)	-1.442** (0.716)	-1.051 (0.779)	-1.079 (0.792)
Release risk level	—	—	0.126 (0.847)	0.521 (1.065)	—	1.744* (0.921)	0.563 (1.087)	0.599 (1.137)
Medical status	—	—	—	-1.142 (0.726)	-1.226* (0.701)	-0.698 (0.657)	-1.135 (0.724)	-1.205 (0.761)
Psychotic MH disorder	—	—	—	-1.178 (1.076)	-1.242 (1.108)	-1.110 (0.885)	-1.212 (1.092)	-1.168 (1.083)
Substance use MH disorder	—	—	—	2.288** (1.124)	2.172** (1.100)	2.440** (1.035)	2.287** (1.130)	2.056* (1.129)
Personality MH disorder	—	—	—	1.791* (0.978)	1.890* (1.024)	1.868** (0.900)	1.908* (1.038)	1.870* (1.078)
Mood MH disorder	—	—	—	-1.310 (0.965)	-1.354 (0.971)	-0.969 (0.846)	-1.338 (0.967)	-1.067 (1.008)
Anxiety MH disorder	—	—	—	-1.422 (0.899)	-1.478* (0.893)	-1.508* (0.821)	-1.416 (0.895)	-1.326 (0.895)
Other MH disorder	—	—	—	1.084 (1.342)	1.021 (1.341)	1.240 (1.156)	1.022 (1.319)	-1.785 (1.640)
Ideal pathway into program	—	—	—	—	—	—	—	0.258 (0.748)
Scattered-site housing provider	—	—	—	—	—	—	—	-0.129 (0.751)
AIC	138.67	139.41	117.90	110.87	110.91	119.06	112.64	115.73
Correctly classified (percent)	75.00	74.14	83.62	86.21	86.09	86.96	85.22	85.09
N	116	116	116	116	115	115	115	114

AIC = Akaike Information Criteria. AOD = alcohol or other drug use. MH = mental health. RHO = Returning Home—Ohio.

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

Note: Each column reports selected coefficients and standard errors, in parentheses, from a logistic regression. The coefficient is the expected change in the log odds of any rearrest.

Limitations

Before discussing the conclusions and implications of the findings, a few limitations of the data and analyses are worth mention. First, the evaluation used a quasi-experimental design to determine whether supportive housing was related to recidivism reductions. Although the evaluation used propensity weighting methods to reduce the selection bias, other variables (unmeasurable in this dataset) could be related to RHO participation and outcomes, such as motivation, readiness to change, or aptitude. Several stakeholders were involved in the program's identification and enrollment process, including individuals with experience with the prisoners (ODRC), deep knowledge about the supportive housing service (providers), or both. Although no reason exists to believe the program served only certain types of prisoners it believed could be unequivocally successful in the program, quite a bit of discretion (and bias) was built into the enrollment process for the program. Future research on supportive housing programs for the reentry population that randomizes selection into the program may yield different results.

Second, the study had a relatively short followup period. Recall that several program participants were not enrolled into the program and did not receive housing until weeks or months after their release from prison. Some of those rearrested may have been rearrested before they were placed into supportive housing—meaning, the program benefit being assessed is contact with the program or provider. Therefore, the findings presented herein can be generalized only to this relatively short period (1 year). Additional research that extends the followup period to 2 or 3 years may yield different results. It could be that a program like RHO has significant short-term effects that attenuate over time, particularly if individuals' criminogenic needs are unmet by the program, or it could be that a program like RHO has even greater long-term effects when participants receive more of the housing services and experience greater residential stability.

Third, the evaluation had very limited data on service use as part of the supportive housing. Although the two core program components we measured might have been related to outcomes theoretically, and the lack of significant findings may have been related to the small sample, indeed, there are far more measurable services that may have a relationship to recidivism. As mentioned previously, these services could include the affordability, quality, and location of the housing and the myriad services offered through the housing (for example, treatment and referrals). The evaluation had limited data on the exact services offered to participants. Further, a more robust estimation of the effect of the services would require greater information on participants' needs for those services. Recall that service receipt as a part of supportive housing is determined by risks and needs. We simply did not have the data required to understand the effect of specific services on outcomes, moderated by risks and needs; also, the sample size would likely have been insufficient to model this effect with much precision.

Conclusions and Implications

Despite the study limitations, the program was associated with significant reductions in recidivism, which translates into significant public safety benefits for the communities in which these individuals live. Not to overstate the importance of one study, but the findings have considerable implications

for the reentry housing field given the paucity of empirical information on the utility of permanent supportive housing for the reentry population directly (see Lutze, Rosky, and Falconer, 2011). Most importantly, the RHO program demonstrated that supportive housing is beneficial to the reentry population. RHO participants were recruited directly from correctional institutions and the intention was to provide prerelease reentry planning that led to a relatively seamless, coordinated transition from prison to the community, one of the critical elements of successful reentry programming (Petersilia, 2004; Visser and Travis, 2011). The program sought to identify and enroll those individuals most appropriate for supportive housing and did so across 13 institutions.

The program also demonstrated how a partnership between a correctional agency and community-based providers can be effective. CSH and ODRC recruited experienced professionals, the majority of whom they had histories of working with, and trained them to work with the reentry population and correctional institutions directly. CSH provided constant training and oversight. ODRC allowed providers prerelease access to, and information about, the prisoners so they could ascertain their appropriateness for their specific housing program. The providers were willing to reach into prisons to recruit and enroll participants. Although the program experienced some early implementation issues because of the nascent partnership and the number of partners involved, it is evidence of a partnership that worked well. The significant variation in the services offered and participants recruited demonstrates the success of the partnership. It is apparent that the mix of providers with different service experiences and histories recruited by ODRC and CSH had the right mix of experiences to support and serve the varied population that the prisons referred to them. The success of RHO demonstrated the importance of partnerships between correctional agencies and community-based providers to facilitate successful reentry.

The program further demonstrated the strength of the partnership given the significant overall impact findings and the lack of support for the program pathway and scattered-site provider variables. Although the lack of significant findings may be because of limited data, it may also suggest that the program partners effectively matched the “right” people to the “right” provider. For example, the providers may have departed from the ideal pathway for those individuals they believed to be at lower risk of recidivism, or the scattered-site housing providers may have enrolled only those individuals they believed could be more independent. Indeed, the stakeholder interviews collected through the process evaluation revealed that some providers thought those referred were too mentally ill, whereas others thought those referred weren’t disabled enough to benefit from their program. It is unlikely that these sentiments were about the overall effectiveness of supportive housing for the reentry population rather than the effectiveness of their own supportive housing program for a group of individuals with particular characteristics. By matching the “right” people to the “right” provider, the program demonstrates the utility of having a large network or pool of community-based providers with various experiences and histories with which correctional departments can work.

Finally, although the overall program was effective, this study does show that some participant characteristics were significantly related to recidivism. Specifically, the finding that those with a substance abuse (mental health) or personality disorder diagnosis had worse outcomes than those without these diagnoses may reveal something about RHO or about individuals with these characteristics. Unfortunately, the current study does not provide sufficient data to explore this issue in great detail. RHO may not have recruited providers with strong experiences working with these

two subsets of the mentally ill population and, therefore, the increase in the probability of rearrests among this population is an indication that they were underserved or not well served by the program. Or, this finding may demonstrate that individuals with these two histories are particularly hard to serve or hard to house. The combination of certain mental health diagnoses with recent criminal justice contact may be indicative of a particularly high-risk population.

At this time, however, given that RHO was successful overall and served prisoners with disabilities broadly defined is support for permanent supportive housing becoming a routine part of reentry programming—at least, for the population with behavioral health disabilities and residential instability. This study provides empirical evidence that permanent supportive housing may be a platform toward successful reentry outcomes for this population. Given the substantial numbers of this population in prisons across the country, the provision of supportive housing for this subset of the reentry population could translate into significant future cost savings for state correctional institutions.

Acknowledgments

The Returning Home—Ohio evaluation, on which this study is partially based, was funded mostly by the Ohio Department of Rehabilitation and Correction, with additional funding from the Ohio Department of Mental Health, The Health Foundation of Greater Cincinnati, the Robert Wood Johnson Foundation, and the Corporation for Supportive Housing's Ohio office. The author thanks Jesse Jannetta and Samuel Taxy from the Urban Institute for their research assistance and review of the final article.

Author

Jocelyn Fontaine is a senior research associate in the Justice Policy Center at the Urban Institute.

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Perceptions of Disorder, Violence, and Safety Amid the Transformation of Assisted Housing

Ann Owens

University of Southern California

Abstract

This article examines how changes in assisted housing shape residents' perceptions of disorder, violence, and safety in their neighborhoods. Past research suggests that contextual features of neighborhoods beyond crime shape perceptions, and the demolition and redevelopment of public housing or the presence of voucher users in a neighborhood may be such features. Results suggest that the demolition of public housing in Chicago neighborhoods reduced residents' perceptions of disorder and violence. Residents did not perceive disorder or safety differently in Boston's HOPE VI neighborhoods than in neighborhoods with or without traditional public housing, although data limitations exist. Neighborhoods with increasing numbers of voucher users did not experience rising perceptions of disorder or violence in Chicago. Boston residents perceived their neighborhoods to be less safe if more voucher users lived there, perhaps because voucher users tend to move to higher crime areas. Overall, the transformation of assisted housing appears to shape residents' perceptions of neighborhood disorder, violence, and safety in positive or neutral ways.

Introduction

The public housing program in the United States has been transformed during the past several decades. At the program's peak in 1994, 1.4 million public housing units existed in the United States (Schwartz, 2010). Since then, more than 250,000 public housing units have been demolished, and many public housing developments have been renovated and redeveloped, some through the HOPE VI program, which provided federal funding to demolish and redevelop distressed public housing. Often, HOPE VI redevelopment involved creating mixed-income communities, with

market-rate units alongside public housing units. Assisted housing programs were also created as alternatives to public housing; housing vouchers that provide rental assistance on the private market now house more tenants than public housing.

Past research suggests that the presence of assisted housing influences neighborhoods in many ways, including the built environments, population composition, housing values, crime rates, and property values (see Freeman and Botein, 2002, for a review). In addition to influencing these physical, demographic, economic, and social traits, assisted housing likely influences how residents *perceive* their neighborhood, particularly in terms of its level of disorder, violence, and safety. (By perceptions of disorder, I mean residents' impressions of physical and social cues of crime and incivilities.) The presence of assisted housing conjures negative racially and economically tinged stereotypes about tenant behavior (Freeman and Botein, 2002; Ellen, 2007), which could reduce residents' feelings of safety and order in their community. The demolition or redevelopment of public housing may remove the buildings and residents on which negative perceptions are based, but it also disrupts a neighborhood's social fabric, potentially altering how residents perceive their neighborhood in complex ways. With regard to voucher users, residents often hold negative stereotypes about their behaviors and traits (Galster, Tatian, and Smith, 1999), so residents may perceive more disorder and feel less safe in neighborhoods with many voucher holders.

Although past research has examined how the demolition and redevelopment of public housing and the presence of voucher users affect neighborhood crime, I examine how those conditions shape residents' *perceptions* of disorder, violence, and safety in their neighborhood. I explore this relationship in two cities: (1) Chicago, where a massive overhaul of public housing has occurred since 1999, and (2) Boston, where public housing redevelopment has occurred on a smaller scale during the past 20 years. In Chicago, I examine how public housing demolition affects residents' perceptions of neighborhood disorder and violence. In Boston, I examine how perceptions of neighborhood disorder and safety vary between neighborhoods with and without public housing redeveloped through HOPE VI. In both cities, I examine how perceptions of disorder, violence, and safety vary by the presence of voucher users in a neighborhood. Perceptions of disorder, violence, and safety have consequences for neighborhood and individual well-being, so identifying how perceptions vary by the presence and type of assisted housing is critical in understanding how assisted housing shapes neighborhoods.

Assisted Housing and Disorder, Violence, and Safety

Past research on how assisted housing affects neighborhood disorder, violence, and safety focuses on the effect of assisted housing on crime rates, rather than on the perceptions of neighborhood characteristics. Research finds that voucher users live in neighborhoods with higher than average crime rates (Lens, Ellen, and O'Regan, 2011), but little evidence exists to show that crime increases when voucher users move into a neighborhood (Ellen, Lens, and O'Regan, 2012). Focusing only on former public housing residents rather than the whole voucher population, some evidence shows the crime rate may increase when many former public housing residents relocate to a neighborhood (Popkin et al., 2012; Suresh and Vito, 2007). Past research also finds that crime rates dropped in neighborhoods where public housing was redeveloped through HOPE VI, although perhaps only temporarily (Goetz, 2010; Holin et al., 2003; Zielenbach and Voith, 2010).

Examining *perceptions* of disorder, violence, and safety is important, because perceptions, independent of actual crime, have consequences for neighborhood well-being. Residents' perceptions of disorder in their neighborhood may lead to disinvestment in the neighborhood, depopulation, and crime (Sampson and Raudenbush, 2004; Wilson and Kelling, 1982). The "broken windows" theory of crime (Wilson and Kelling, 1982) contends that physical and social cues of disorder can lead to crime through two channels: (1) when residents observe disorder in their neighborhood, they may feel that neighbors are not willing to act to prevent petty crime, which may reduce their own likelihood to prevent crime in the neighborhood; and (2) when would-be criminals see disorder, they take it as a sign that neighbors no longer maintain social control over the neighborhood and that their crimes will also go unchecked. Perceptions of disorder and safety also have consequences for individual well-being, including mental health (Geis and Ross, 1998; Ross, Reynolds, and Geis, 2000) and physical health, particularly obesity (Burdette, Wadden, and Whitaker, 2006).

Research on public housing redevelopment and voucher mobility programs has documented assisted residents' perceptions of reduced disorder and improved safety. Burby and Rohe (1989), in their study of eight developments, found that residents of public housing developments outside the inner-city report less fear of crime than residents of public housing developments in inner-city ghetto neighborhoods, suggesting that deconcentrating public housing may reduce residents' perceptions of crime. Using data from the HOPE VI Panel Study, Popkin and Cove (2007) found that, at baseline, residents of five developments slated for HOPE VI redevelopment reported high levels of social disorder and perceived violent crime to be a big problem. In followup surveys during 6 years, residents living in new HOPE VI developments or renting on the private market with vouchers or without rental assistance reported perceiving much less disorder and violent crime in their neighborhoods. Survey data also suggest that residents displaced from Chicago public housing projects because of demolition reported feeling safer and perceiving less disorder and violence in their new communities, where many rent using housing vouchers, compared with their perceptions of their former home in public housing (Popkin and Price, 2010). Evaluations of the Moving to Opportunity experiment found that participants in the experimental group, who received housing vouchers to rent in low-poverty neighborhoods, reported feeling safer and feeling that their children were safer compared with the reports of control families, which led to improvements in mental health and reductions in stress, particularly among women and girls (Briggs, Popkin, and Goering, 2010; Goering and Feins, 2003; Popkin, Leventhal, and Weismann, 2008).

This article builds on this past research by examining how assisted housing shapes perceptions of disorder, violence, and safety among *all* residents in a neighborhood, rather than among only assisted residents. Rather than evaluating the effects of public housing redevelopment and voucher use on individuals, I investigate how assisted housing shapes neighborhood-level perceived safety and disorder.

Neighborhood Predictors of Perceived Disorder and Safety

Neighborhood characteristics like concentrated disadvantage and racial composition, collective efficacy, mixed residential and commercial land use, and real crime and cues of disorder shape residents' perceptions of disorder, violence, and safety (Sampson, 2012). Past research shows that residents perceive greater physical and social disorder in neighborhoods with more African-American, immigrant, and poor residents, independent of actual levels of crime and disorder (Krivo, Peterson, and Karafin,

2006; Quillian and Pager, 2001; Sampson and Raudenbush, 2004). In fact, racial or ethnic composition better predicts perceived disorder than do actual cues of disorder (Sampson, 2012). African Americans were no less likely than Whites to perceive more disorder when a neighborhood had more minority residents, independent of physical cues of disorder (Sampson and Raudenbush, 2004).

Collective efficacy, or residents' social cohesion around shared expectations and willingness to exert social control to achieve those expectations, is associated with perception of less disorder (Sampson, 2012; Sampson and Raudenbush, 1999). Perceptions of violence and safety are similarly influenced by residents' social integration into the neighborhood (Hunter and Baumer, 1982).

Land use and architectural features also shape perceptions of disorder and safety. Jacobs' (1961) seminal research posited that, in city blocks with mixed residential and commercial land uses, actual and perceived disorder are low, because residents are aware of many "eyes on the street" and "public characters" that preserve order and safety. Subsequent research, however, showed that streets with more nonresidential land use have greater perceived crime and disorder (McCord et al., 2007; Taylor et al., 1995; Wilcox et al., 2004). On blocks with nonresidential land uses, there may be fewer territorial markers signaling social control over the space (Taylor, Gottfredson, and Brower, 1984). In terms of buildings, architectural features that encourage resident surveillance and clear delineation of public and private space, following the principles of defensible space (Newman, 1972), may reduce fear of crime and disorder.

Actual cues of physical and social disorder—such as broken windows, graffiti, loitering, and public drinking—shape perceptions of disorder (Sampson, 2012) and safety (Baba and Austin, 1989; Skogan and Maxfield, 1981). The research reviewed above, however, suggests that an individual's social position, social context, and implicit bias associated with neighborhood characteristics like racial composition may shape perceptions of disorder more strongly than actual disorder (Sampson, 2012). This finding emphasizes the importance of social contexts in shaping perceptions of neighborhood characteristics, and I explore whether the presence, demolition, and redevelopment of assisted housing are contextual elements that also shape perceptions of disorder, violence, and safety.

The Role of Assisted Housing in Residents' Perceptions of Disorder, Violence, and Safety

By the late 1980s, many public housing projects, including those in Boston and Chicago, exhibited outward signs of real crime and cues of disorder (Bennett, Smith, and Wright, 2006; Hunt, 2009; Popkin et al., 2000; Tach, 2009; Vale, 2002) and of physical deterioration, influencing decisions to demolish these projects and redevelop them into mixed-income communities or offer the former residents vouchers. (Goetz, 2011; Kingsley, Johnson, and Pettit, 2003). The demolition or redevelopment of public housing altered many of the neighborhood characteristics theorized to shape perceptions of disorder, violence, and safety, described in the previous section, so perceptions of disorder, violence, and safety may also have been affected.

First, with regard to neighborhoods' economic and racial composition, if demolition or redevelopment reduces the number of poor and minority residents, one would expect perceptions of disorder to decline as public housing is demolished and to be lower in neighborhoods with redeveloped

public housing compared with neighborhoods with traditional public housing. Perceptions of disorder are influenced not only by racial composition but by racial stereotypes linked to criminal activities (Quillian and Pager, 2001). Stereotypes about minority public housing tenants' behavior and the large population of seemingly unsupervised children in single-parent homes in large public housing projects (Hunt, 2009) may mean that perceptions of disorder will decline after the demolition of the projects. Past research found that neighborhoods around many HOPE VI developments had higher resident income, education, and employment rate and increased racial diversity after redevelopment (Holin et al., 2003; Popkin et al., 2004; Zielenbach, 2003; Zielenbach and Voith, 2010), suggesting that residents may perceive less disorder and feel safer in HOPE VI neighborhoods.

In terms of collective efficacy, past research identified high levels of collective efficacy among Chicago public housing residents during the threat of public housing demolition (Venkatesh, 2000) and among Boston public housing residents before HOPE VI redevelopment (Curley, 2010). Therefore, if demolition or redevelopment broke up these community ties, perceptions of disorder and violence may increase and perceptions of safety may decrease. Indeed, research on redeveloped mixed-income communities in Boston found little evidence of strong social ties between old-timers and newcomers (Breitbart and Pader, 1995; Pader and Breitbart, 1993; Tach, 2009). Longtime residents may perceive less disorder in their community if they are comparing it with pre-redevelopment conditions, whereas new residents may perceive high levels of disorder, because their perceptions may draw on the neighborhood's previous reputation and their own lack of ties with neighbors. Past research provides little insight about the collective efficacy among residents living in neighborhoods with public housing developments who do not live in the developments, so it is unclear how redevelopment affects collective efficacy among this group.

Changes to land use and housing quality during public housing redevelopment and demolition may also influence perceptions of the neighborhood. Past research showed that positive ratings of housing quality decreased residents' fears of crime in their neighborhood, in part because it increased their physical and social satisfaction with the neighborhood (Austin, Furr, and Spine, 2002). HOPE VI developments had significantly improved quality of housing (Holin et al., 2003) and some HOPE VI sites led to new infrastructure in surrounding areas (Popkin et al., 2004), so perceptions of safety may be heightened and perceptions of disorder reduced in HOPE VI neighborhoods. Architectural features of public housing did not produce defensible space and limited neighbors' ability to exert social control and build social ties, leading to high levels of actual and perceived disorder (Jacobs, 1961; Popkin et al., 2000). HOPE VI developments in particular took a New Urbanism design approach to create common space to facilitate social ties and social control, which may lead to perception of less disorder. The process of demolition was often long, however, and led to uncertainty about the redevelopment of the cleared land. Demolition with no clear redevelopment plan can lead to vacancies and decline in neighborhood economic and social well-being, which may increase the fear of crime (Beauregard, 1990; Skogan, 1986). In Chicago, many new developments are built in different census tracts than demolished public housing, so neighbors around the demolished buildings may perceive increased disorder compared with pre-demolition levels as their neighborhood remains depopulated with vacant physical spaces.

Finally, the demolition or redevelopment of public housing may lead to changes in actual crime and cues of disorder. Popkin et al. (2012) found that crime rates fell substantially in neighborhoods

where public housing was demolished. Others have found lower levels of crime after redevelopment in some HOPE VI neighborhoods (Holin et al., 2003; Popkin et al., 2004; Zielenbach, 2003; Zielenbach and Voith, 2010).

The presence of voucher users does not alter the physical characteristics of a neighborhood but does potentially alter neighborhood composition and social cohesion. Owens (2012) found that voucher users live in neighborhoods with increasing poverty rates, so these neighborhoods may also have greater perceived disorder. Voucher users are less visible than public housing projects, so one might imagine that their effect on neighbors' perceptions is negligible. Galster, Tatian, and Smith (1999) provided mixed evidence. On the one hand, residents associate voucher units with racial minorities and negative tenant behaviors, which may be associated with increased levels of perceived disorder. On the other hand, residents often misidentify voucher units, so perceptions of disorder may be only loosely coupled with the presence of voucher users. With regard to actual crime, Popkin et al. (2012) found that crime increased in Chicago and Atlanta neighborhoods where many families used vouchers to relocate from demolished public housing. Examining all voucher users, rather than only relocatees, Ellen et al. (2012) found that crime rates are higher in neighborhoods with more voucher households, but they find no evidence of a causal relationship, instead finding that voucher users move to neighborhoods with increasing crime rates. Given these characteristics of the neighborhoods where voucher users live, one might expect increased perceptions of disorder and violence and reduced feelings of safety when many voucher units are present.

Past research suggests mixed hypotheses for how the transformation of assisted housing shapes perceptions of disorder, violence, and safety. On the one hand, the demolition of troubled public housing projects likely reduces perceptions of disorder and violence and increases perceptions of safety in a neighborhood because concentrations of poor and minority residents may break up and because real crime and cues of disorder are reduced. On the other hand, demolition may increase perceptions of disorder and violence because it breaks up existing social ties that foster collective efficacy. Comparing traditional public housing with HOPE VI redevelopment, new physical structures more suited to social control and social cohesion may lead to reduced perceptions of disorder and violence and may increase feelings of safety throughout the neighborhood, but social ties that facilitate collective efficacy may be scarce within new developments where neighbors are wary of one another, which could spill over to residents outside the development. With regard to the presence of voucher users, past research suggests that a concentration of voucher users may be associated with heightened levels of perceived disorder and violence and reduced feelings of safety.

Data and Analysis

This study addresses three questions: (1) Does the demolition of public housing influence perceptions of disorder and violence? (2) Do perceptions of disorder and safety vary between neighborhoods with traditional public housing and those with HOPE VI developments? (3) Do perceptions of disorder, violence, and safety vary according to the presence of voucher users? I answer the first question with data from Chicago, the second question with data from Boston, and the third question with data from both cities. I examine Chicago and Boston primarily because data on neighborhood social processes like perceptions of disorder, violence, and safety have been collected in these cities through the Project on Human Development in Chicago Neighborhoods (PHDCN) and the Boston Neighborhood Survey (BNS). Each city has a particular approach to and history with the public

housing and voucher programs, and results may not be generalizable to cities with very different assisted housing, social, or demographic contexts. Public housing demolition, HOPE VI, and vouchers are common features in cities across the United States, however, and therefore these analyses provide some insight into how assisted housing may shape perceptions of disorder, violence, and safety.

Chicago operates one of the largest assisted housing programs in the country, and historically its public housing projects, primarily large developments with high-rise towers, were troubled by crime and poverty concentration (Hirsch, 1983; Hunt, 2009; Popkin et al., 2000). I examine data on residents' perceptions of disorder and violence from 1995 and 2002, which captures the final decline of Chicago's public housing and the beginning of large-scale demolition and redevelopment. By the late 1980s, Chicago's public housing developments were home to the city's most disadvantaged residents, many of them single mothers who had never worked, and 11 of the 15 poorest census tracts in the nation in 1990 contained Chicago Housing Authority (CHA) developments (Hunt, 2009). CHA was also plagued by mismanagement, maintenance backlogs, and budget shortfalls, and it was eventually taken under federal receivership in 1995 after having been on the troubled housing authority list since 1979 (Hunt, 2009). CHA began to experiment with redeveloping high-rise buildings as mixed-income communities, most notably with Lake Parc Place in 1988 (described by Pattillo, 2007) before adopting the Plan for Transformation (the Plan).

In 1999, Chicago implemented the Plan, which aimed to demolish 25,000 family public housing units, "voucher out" many residents, and overhaul the public housing program, with end goals of physical redevelopment of public housing, increased income mix in public housing, and 13,000 fewer public housing units (Bennett, Smith, and Wright, 2006; CHA, 2000a). Even before the Plan's implementation, demolition of public housing was underway in Chicago, with at least partial demolition of several large developments and scattered-site units. Much of this demolition occurred through HOPE VI grants, of which CHA received 40 before 2002, many more grants than any other city, for the planning, demolition, or revitalization of public housing (HUD, 2011, 2004, n.d.). Although not typical of cities with public housing across the country, Chicago can be viewed as a strong case of public housing demolition and redevelopment and is often looked to by housing authorities across the country (Popkin, 2013). I assess how public housing demolition influences perceptions of disorder and violence, comparing neighborhoods that never had public housing projects, neighborhoods with public housing where no demolition occurred, and neighborhoods where the demolition of public housing occurred between 1995 and 2002. I also assess how changes in the number of voucher units shaped neighborhood perceptions of disorder and violence during this time.

Boston's public housing program is smaller than Chicago's but larger than that of most cities, with most units built before 1960 (Vale, 2002). Boston's public housing population, like those in Chicago and many other cities, experienced economic decline starting in the 1960s, but Boston public housing also underwent a racial transition from mainly White (22 of the 25 largest family public housing developments were built in initially White neighborhoods for White residents) to African American (Vale, 2002). Racial tensions heightened wariness and mistrust among neighbors and perceptions that public housing residents contributed to most neighborhood problems. The Boston Housing Authority (BHA) was plagued by mismanagement during the 1970s and 1980s amidst the economic and racial transformation of its clientele, and it was placed into receivership in 1980.

Boston undertook several public housing redevelopment initiatives before the HOPE VI program, starting with Harbor Point, which served as a model for mixed-income redevelopment after it was completed in 1990. (Pader and Breitbart, 1993; Vale, 2002). Boston was awarded a HOPE VI planning grant for the Orchard Park development in 1995 (HUD, n.d.) and was awarded revitalization grants for Mission Main (1993), Orchard Park (1995), and Maverick Gardens (2001) (HUD, 2011).¹ All three public housing developments initially had “superblock” architecture, with multiple buildings arranged around interior sidewalks, isolated from the larger neighborhood. The developments also had high crime and vacancy rates and were among the most dangerous areas in the city. The redevelopment of Orchard Gardens was completed in the mid-1990s, Mission Main in 2001, and Maverick Landing in 2006. HOPE VI developments typically have fewer public housing units than the original developments, meaning that many original residents cannot return. Available evidence suggests that, in Boston, more residents than is typical for HOPE VI were able to return after redevelopment because of many initial vacancies. For example, about 50 percent of the residents in Maverick Gardens returned to Maverick Landing after HOPE VI development (Curley, 2010). I examine data on residents’ perceptions of disorder and safety in 2008, when these three HOPE VI projects had reopened after demolition and redevelopment. I compare perceptions of disorder and safety among neighborhoods that do not have public housing, neighborhoods with traditional public housing, and neighborhoods with HOPE VI developments. I also examine how perceptions of disorder and safety vary by the number of voucher units in a neighborhood in 2008.

Measuring Perceptions of Disorder, Violence, and Safety

The dependent variables in this study are neighborhood-level aggregations of residents’ perceptions of disorder, violence, and safety in their neighborhood. In Chicago, data come from the PHDCN, an ongoing longitudinal study of Chicago residents that includes many data collection components (see Sampson, 2012, for a complete description of the PHDCN). In this study, I focus on the Community Survey (CS). The CS was administered to residents of Chicago neighborhoods twice, in 1995 and from 2001 through 2002 (I refer to this wave as 2002). The CS was designed to uncover residents’ attitudes and assessments of structural and cultural aspects of their neighborhoods. The multistage sampling frame led to random selection of respondents by first selecting block groups within Chicago’s 343 neighborhood clusters (NCs, which comprise 2 to 3 geographically adjacent and socially similar census tracts), then households within block groups, and finally one adult respondent within each household. The 1995 CS included more than 8,500 respondents interviewed in person, with an average of 25 respondents per NC. The 2002 CS, smaller by design, included more than 3,100 respondents representing the 343 NCs. My analyses are at the NC level, to which I refer as neighborhoods. Data on the outcome variables of interest are not available for 2 NCs, so the analytic sample N is 341.

¹ BHA also received HOPE VI revitalization grants for Washington Beech (2007) and Old Colony (2010) (HUD, 2011), but these redevelopments were not complete by 2008, so I exclude them from my study.

The CS asks about perceptions of both disorder and violence. To capture residents' perceptions of social and physical disorder, the CS asked the following questions—

1. How much broken glass or trash on sidewalks and streets do you see in your neighborhood?
2. How much graffiti do you see on buildings and walls in your neighborhood?
3. How many vacant or deserted houses or storefronts do you see in your neighborhood?
4. How often do you see people drinking in public places in your neighborhood?
5. How often do you see unsupervised children hanging out on the street in your neighborhood?

Responses were coded from 1 to 4, with 1 meaning none or never and 4 indicating a lot or very often. In 1995, the wording was slightly different—rather than being asked how much something happened, respondents were asked how much of a problem certain types of disorder were, and responses were coded from 1 (not a problem) to 3 (a big problem). Neighborhood-level scales were rescaled to be comparable across years.

To capture perceived violence, respondents were asked, “During the past 6 months, how often was there...”

1. A fight in this neighborhood in which a weapon was used?
2. A violent argument between neighbors?
3. Gang fights?
4. A sexual assault or rape?
5. A robbery or mugging?

Responses were coded from 1 (never) to 4 (often). To create neighborhood-level scales of perceptions of disorder and perceptions of violence, a hierarchical linear modeling procedure was used to nest scale items at level 1, taking missing items into account, the respondent at level 2, and the neighborhood at level 3.

In Boston, data on residents' neighborhood perceptions come from the BNS, a biennial telephone survey of adults in Boston neighborhoods, one component of the Boston Data Project. The BNS sampling frame was stratified over 38 neighborhoods, and more than 4,000 total respondents were surveyed about a host of neighborhood characteristics in 2006, 2008, and 2010. I use the 2008 wave because the 2006 questionnaire does not include questions on social disorder. The BNS offers three neighborhood definitions: census tracts and two sets of NCs that combine geographically contiguous tracts to create socially meaningful NCs, one with 90 NCs and one with 38. To maintain statistical power, I use the 90 NCs (results are similar regardless of NC definition used).

The BNS asks residents about perceptions of disorder and about how safe they feel in their neighborhoods. I created a resident disorder scale by calculating residents' mean responses to the same questions the PHDCN asks, and I created a neighborhood disorder scale by calculating the mean of the resident disorder scale in each of the 90 NCs, following Rothman et al. (2011). I measured feelings of safety from three questions.

1. Do you consider your neighborhood... (a) very safe, (b) somewhat safe, or (c) not safe?
2. How comfortable do you feel walking alone in your neighborhood during the day?
3. How comfortable do you feel walking alone in your neighborhood at night?

The responses for questions 2 and 3 are very comfortable, somewhat comfortable, or not comfortable. I recoded these items so a higher value means feeling safer in one's neighborhood and calculate neighborhood-level scales as I did for perceptions of disorder.

Neighborhoods can be measured in many ways. Here, NCs map onto locally known neighborhoods. That said, respondents are not prompted to consider any particular geographic space when answering questions about their neighborhood. By averaging across residents, the PHDCN and BNS attempt to measure neighborhood-level social processes. I do not account for potential spillover effects or spatial dependencies. In both cities, public housing developments are locally associated with particular neighborhoods that correspond well with NC boundaries, so the effect of assisted housing is most likely associated with the surrounding NC. Future research could consider spillover effects to adjacent NCs or could measure neighborhoods of various radii around demolition and redevelopment sites and define neighborhoods in this way.

Assisted Housing Data

The main independent variables of interest measure characteristics of public housing and vouchers in neighborhoods. For Chicago, I examine the effect of public housing demolition. The U.S. Department of Housing and Urban Development's (HUD's) *A Picture of Subsidized Households 2000* provides geocoded location data for public housing projects that existed as of 2000. I used the geocoded data to identify NCs with family housing projects from 1995 to 2002.² I consider only family public housing, not public housing developments exclusively for elderly residents, because public housing for elderly people likely does not exhibit the same cues of disorder and violence as family public housing (as evidenced by the fact that the Plan involved primarily renovating, not demolishing, public housing for elderly people). I obtained data on the addresses of buildings that were demolished before 2002 from CHA documentation (CHA, 2002, 2001, 2000b), newspaper reports, and internet searches.³ Therefore, I compare three types of neighborhoods: (1) neighborhoods that never had family public housing, (2) neighborhoods with family public housing where demolition had not occurred as of 2002, and (3) neighborhoods where public housing demolition occurred before 2002. Neighborhoods in which demolition had occurred may still have had some family public housing in 2002—for example, demolition of the Robert Taylor Homes started in 1998 but did not end until 2007. Chicago used HOPE VI grants to redevelop several of its public housing developments, but these new projects had not opened as of 2002, so my analyses focus on demolition, not redevelopment.

In Boston, I compare perceptions of disorder and safety in three types of neighborhoods: (1) neighborhoods that never had family public housing, (2) neighborhoods with family public housing where HOPE VI redevelopment has not occurred, and (3) neighborhoods where HOPE VI redevelopment

² I cross-referenced these data with data collected by RW Ventures, LLC, from HUD on public housing in Chicago from 1990 to 2004 (RW Ventures, 2010), annual reports of CHA, and data collected by the Illinois Assisted Housing Action Research Project and maintained by the Voorhees Center at the University of Illinois-Chicago (Voorhees Center, 2010) to account for all family public housing projects in existence from 1995 to 2002.

³ I cross-referenced these data with data received via a Freedom of Information Act request made by Edward Goetz to HUD on demolition activity after 1995.

has occurred. Data on the location of family public housing come from HUD's *A Picture of Subsidized Housing 2008*, and I cross-reference these addresses with the BHA website to code NCs as having family public housing projects. I created an indicator of the NCs in which the Mission Main, Orchard Gardens, and Mavericks HOPE VI developments are located based on BHA reports.

In addition to public housing demolition and redevelopment, I explore how perceptions of disorder, violence, and safety vary by the presence of vouchers in a neighborhood. In Chicago, I examine changes in the number of vouchers from 1997 to 2000. To match the PHDCN data, I would like data from 1995 and 2002, but these data are not available.⁴ Data on the number of vouchers in each neighborhood in 1997 and 2000 come from HUD's *A Picture of Subsidized Households* in each year. In Boston, I compare perceptions of disorder and safety in neighborhoods with varying number of voucher users. Data on the number of voucher users in 2008 come from HUD's *A Picture of Subsidized Households 2008*.

Control Variables

I control for socioeconomic and demographic variables that have been shown to predict perceptions of disorder. In Chicago, I use data from the 1990 and 2000 census, normalized to 2000 tract boundaries (GeoLytics, Inc., 2003) on neighborhood racial or ethnic and immigrant composition and on poverty, unemployment, and female-headed household rates to account for concentrated disadvantage and minority composition. I aggregate the tract-level data to the NC level and use linear interpolation between the 1990 and 2000 censuses to estimate conditions in 1995 and 2002. In Boston, I control for the same variables from the 2005–09 American Community Survey, which provides a 5-year aggregation of data at the tract level, which I aggregate to the NC level. I also control for collective efficacy in 1995 and 2002 in Chicago from the PHDCN and in 2008 in Boston from the BNS. The PHDCN and BNS ask nearly identical questions capturing both the social cohesion and social control aspects of collective efficacy.⁵

I control for crime rates in each city to isolate the relationship between assisted housing and *perceptions* of disorder, violence, and safety independent of actual crime levels. In Chicago, yearly crime data at the census tract level come from the Chicago Police Department. I create two indices, violent crime rates (homicide and robbery) and property crime rates (burglary and vandalism), by aggregating tract counts to the NC level and then calculating rates per 100,000 people in 1995 and 2002. In Boston, crime data at the census tract level in 2008 come from the Boston Police Department. I again create crime rates for violent (homicide, rape, robbery, aggravated assault) and property (burglary, larceny, motor vehicle theft, arson) crime by aggregating tract counts to the NC level and scaling the counts for each crime type per 100,000 people.

⁴ HUD does provide 1996 data, but fewer than one-half of units are reported, and the number of vouchers it reports in Chicago is much less than the number reported in CHA documentation, so I use 1997 data, which appear more accurate. I also run analyses with the change in vouchers from 1997 through 2003, using data from 2003 from the Illinois HUD office, obtained from the Voorhees Center at the University of Illinois-Chicago. The results are substantively identical to those presented here.

⁵ See Sampson (2012) for more information on the construction of the collective efficacy scale.

Analysis Plan

I examine how the demolition or redevelopment of public housing and the presence of voucher users influence perceptions of disorder, violence, and safety in Chicago and Boston. In Chicago, I take advantage of longitudinal data to examine how demolition and changes in the number or rate of voucher users shape changes in perceptions of disorder and violence. In Boston, I use data only from 2008 and thus am limited to describing associations between public housing redevelopment or vouchers and perceptions of disorder and safety.

Chicago

In Chicago, the data allow for an examination of longitudinal changes in perceptions of disorder and violence from 1995 through 2002 using analysis of covariance (ANCOVA) models. ANCOVA models control for the initial level of the dependent variable, allowing for better estimates of causal effects. Following Morgan and Winship (2007), ANCOVA models are appropriate to identify longitudinal effects in panel data when selection on the dependent variable is likely. Here, particularly troubled public housing developments in terms of crime and violence were among those identified for demolition, so it is likely that these developments had greater initial perceived disorder and crime. The ANCOVA model adjusts for this selection. The equation for the model is (Kessler and Greenberg, 1981)—

$$y_{it+1} = \alpha + \beta_1 y_{it} + \beta_2 d_i + \beta X_{it} + \beta X_{it+1} + \varepsilon, \quad (1)$$

where y_{it+1} is the level of perceived disorder or violence in neighborhood i at time $t + 1$ (2002); y_{it} is the level of perceived disorder or violence in neighborhood i at time t (1995); d_i indicates assisted housing type or presence; X_{it} is the vector of control variables (socioeconomic and demographic characteristics, collective efficacy, and crime) in 1995 and X_{it+1} is the vector of control variables in 2002. In the first set of models, d_i is a categorical variable classifying neighborhoods as (1) never having had public housing; (2) having public housing but no demolition from 1995 through 2002; or (3) experiencing public housing demolition between 1995 and 2002. In the second set of models, d_i is the change in the number of vouchers from 1997 through 2000. I interpret results as providing evidence that public housing demolition caused changes in perceptions, but causal estimates may be biased if I have omitted variables from the model.

Boston

In Boston, I examine perceptions of disorder and safety in 2008 using cross-sectional regression analyses. The model is represented by the equation—

$$y = \alpha + \beta_1 H + \beta X + \varepsilon, \quad (2)$$

where y represents perceptions of either disorder or safety in 2008 and H represents variation in assisted housing. In the first set of models, H is an indicator variable comparing neighborhoods with (1) no public housing, (2) traditional public housing, and (3) HOPE VI developments. Only three NCs in Boston contain HOPE VI developments, so the models should be interpreted with caution because of lack of statistical power. In the second set of models, H is a variable indicating the voucher rate in 2008. X is a vector of control variables that may predict perceptions of disorder and safety: collective efficacy, socioeconomic or demographic traits, and crime rates.

Descriptive Results

Before reporting results from multivariate analyses, I describe how perceptions of disorder, violence, and safety vary among neighborhoods with different types of assisted housing. I also show how neighborhoods with different types of assisted housing differ from one another in terms of demographic characteristics and crime.

Demolition in Chicago

Exhibit 1 presents descriptive statistics for the independent and control variables, comparing Chicago NCs that never had family public housing, NCs with family public housing where demolition did not occur before 2002, and NCs where family public housing demolition had occurred

Exhibit 1

Descriptive Statistics, by Public Housing Status (Chicago)

	No PH		PH, No Demolition		PH, Demolition	
	Mean	SD	Mean	SD	Mean	SD
Perceptions of disorder, 1995	2.270*^	0.459	2.450^	0.444	2.990	0.343
Perceptions of disorder, 2002	2.524*^	0.407	2.728	0.363	2.932	0.285
Perceptions of violence, 1995	2.024*^	0.321	2.147^	0.323	2.505	0.252
Perceptions of violence, 2002	1.838*^	0.249	1.991	0.259	2.088	0.265
Collective efficacy, 1995	3.020*^	0.171	2.942	0.154	2.822	0.130
Collective efficacy, 2002	3.138*^	0.124	3.056	0.126	3.027	0.120
Proportion NH White, 1995	0.338*^	0.328	0.279^	0.255	0.019	0.025
Proportion NH White, 2002	0.283^	0.310	0.229	0.254	0.032	0.042
Proportion NH African American, 1995	0.407^	0.429	0.353^	0.404	0.962	0.034
Proportion NH African American, 2002	0.422^	0.431	0.369^	0.395	0.935	0.055
Proportion Hispanic, 1995	0.208*^	0.253	0.347^	0.310	0.014	0.019
Proportion Hispanic, 2002	0.243*^	0.287	0.374^	0.338	0.024	0.026
Proportion foreign born, 1995	0.170^	0.157	0.185^	0.150	0.006	0.007
Proportion foreign born, 2002	0.200^	0.180	0.221^	0.173	0.017	0.010
Poverty rate, 1995	0.197*^	0.125	0.262^	0.149	0.644	0.105
Poverty rate, 2002	0.195*^	0.118	0.244^	0.143	0.549	0.127
Unemployment rate, 1995	0.122^	0.074	0.136^	0.087	0.353	0.083
Unemployment rate, 2002	0.118^	0.080	0.125^	0.094	0.284	0.086
Proportion female-headed HH, 1995	0.370^	0.202	0.405^	0.212	0.824	0.051
Proportion female-headed HH, 2002	0.367^	0.205	0.387^	0.209	0.777	0.082
Violent crime rate, 1995	1174.490^	955.925	1067.977^	639.039	2748.004	1276.000
Violent crime rate, 2002	711.695^	556.649	724.746	393.482	1307.711	523.100
Property crime rate, 1995	3937.576^	1401.176	4334.012^	1297.421	8423.312	1869.800
Property crime rate, 2002	3325.455*^	1503.621	3952.047^	1860.591	7182.445	1856.400
N (NCs)	275		53		13	

HH = households. NCs = neighborhood clusters. NH = non-Hispanic. PH = public housing. SD = standard deviation.

* Significantly different from PH, no demolition ($p \leq 0.05$).

^ Significantly different from PH, demolition ($p \leq 0.05$).

by 2002. As the bottom row indicates, 275 of Chicago's 341 NCs never had public housing (of the 2 NCs excluded from analyses, neither had public housing). Of those NCs that did have public housing, demolition had occurred in 13.

Perceived disorder and violence in 1995 were lowest in neighborhoods that never had public housing and highest in neighborhoods where public housing was demolished, confirming selection on the dependent variable: demolition occurred in places where perceptions of disorder and violence were highest. In 2002, perceived disorder and violence was significantly lower in neighborhoods that never had public housing, with no significant difference between neighborhoods where demolition did and did not occur.

Collective efficacy in 1995 and in 2002 is greatest in neighborhoods that never had public housing but does not vary between NCs with public housing where demolition did or did not occur. NCs where demolition occurred had a significantly lower proportion of White, Hispanic, and foreign-born residents and significantly greater proportions of African-American residents compared with the proportions in neighborhoods where public housing was never built or where demolition did not occur. The poverty, unemployment, female-headed household, and crime rates were all lowest in neighborhoods that never had public housing and highest in neighborhoods where demolition occurred. Neighborhoods where demolition occurred appear to be markedly different than other neighborhoods, emphasizing the extreme disadvantage and decay associated with large public housing projects slated for demolition, even after demolition has begun.

Public Housing Redevelopment in Boston

Exhibit 2 presents descriptive statistics for Boston neighborhoods with no public housing ($N = 76$), with family public housing ($N = 10$), and with HOPE VI developments ($N = 3$) (one NC without data on perceptions of disorder and safety is excluded; it had no public housing). Neighborhoods with public housing are significantly different from neighborhoods without public housing on nearly all characteristics, whereas HOPE VI neighborhoods do not differ significantly from either neighborhood type on any indicator except for having higher levels of violent crime than neighborhoods with no public housing. Although the differences among neighborhood types are not significant, HOPE VI neighborhoods appear more similar to neighborhoods with public housing than those without.

Neighborhoods with no public housing have the least perceived disorder and the greatest perceived safety, significantly different only from neighborhoods with public housing. HOPE VI neighborhoods fall in the middle on both scales but are not significantly different from neighborhoods either with or without public housing, perhaps because of the small N . Neighborhoods with HOPE VI developments have little collective efficacy (as Tach, 2009, suggests), as little as neighborhoods with public housing. Both public housing and HOPE VI neighborhoods have more minority and fewer White residents and higher poverty rates than neighborhoods without public housing. HOPE VI neighborhoods have high rates of foreign-born residents, reflecting the Mavericks development in East Boston, a neighborhood with a large Dominican population. HOPE VI neighborhoods have lower poverty, unemployment, and female-headed household rates than neighborhoods with public housing. HOPE VI neighborhoods, however, have crime rates nearly as high as neighborhoods with public housing, with violent crime rates significantly higher than among neighborhoods with no public housing.

Exhibit 2

Descriptive Statistics, by Public Housing Status (Boston)

	No PH		PH		HOPE VI	
	Mean	SD	Mean	SD	Mean	SD
Perceptions of disorder, 2008	1.563*	0.244	1.804	0.238	1.783	0.136
Perceptions of safety, 2008	2.470*	0.211	2.209	0.242	2.322	0.083
Collective efficacy, 2008	3.014*	0.201	2.788	0.260	2.792	0.186
Proportion NH White, 2005–09	0.541*	0.296	0.252	0.227	0.326	0.165
Proportion NH African American, 2005–09	0.210	0.243	0.376	0.239	0.280	0.302
Proportion Hispanic, 2005–09	0.138*	0.121	0.261	0.106	0.281	0.181
Proportion foreign-born, 2005–09	0.253	0.120	0.261	0.105	0.353	0.186
Poverty rate, 2005–09	0.168*	0.100	0.438	0.158	0.271	0.132
Unemployment rate, 2005–09	0.056*	0.032	0.105	0.023	0.087	0.035
Proportion female-headed HH, 2005–09	0.364*	0.221	0.664	0.113	0.501	0.211
Violent crime rate, 2005–09	839.881*^	680.102	1587.439	705.042	1432.624	666.837
Property crime rate, 2005–09	3,627.687	3,212.94	4,059.704	1,703.824	3,989.403	1,320.434
N (NCs)	76		10		3	

HH = households. NCs = neighborhood clusters. NH = non-Hispanic. PH = public housing. SD = standard deviation.

* Significantly different from public housing ($p \leq 0.05$).

^ Significantly different from HOPE VI ($p \leq 0.05$).

Vouchers in Chicago and Boston

Exhibit 3 presents the number of vouchers and voucher rates in Chicago and Boston and their relationship with perceptions of disorder and violence or safety over time. The top panel shows that, in Chicago, the raw number of vouchers in each NC increased, on average, from 1997 through 2000, as did the total number in the city. (During this time, CHA received several thousand additional housing vouchers to provide housing for residents displaced from public housing, but many residents moved to other public housing developments rather than using vouchers.) The voucher rate—the number of vouchers as a proportion of total households—increased as well so that, by 2000, vouchers made up, on average across NCs, 2.1 percent of housing units. Exhibit 3 also presents the correlation between number of vouchers or voucher rate and perceptions of disorder and violence in each year. In both years, a greater number or rate of vouchers is associated with greater perceived disorder and violence.

The lower panel of exhibit 3 shows the average neighborhood in Boston has about 176 voucher holders (although 50 percent of NCs have fewer than 100), comprising about 6 percent of households, on average. The correlations show that residents felt less safe in neighborhoods with a greater number or rate of voucher units, but the presence of vouchers in a neighborhood has no relationship with perceptions of disorder.

Exhibit 3**Housing Vouchers and Perceptions of Disorder, Violence, and Safety (Chicago and Boston)**

Chicago	Mean	SD		
Change in vouchers, 1997 through 2000	24.035	37.305		
Change in voucher rate, 1997 through 2000	0.005	0.021		
Correlations	Vouchers 1997	Voucher rate 1997	Vouchers 2000	Voucher rate 2000
Perceptions of disorder, 1995	0.263***	0.324***	0.305***	0.422***
Perceptions of violence, 1995	0.348***	0.363***	0.374***	0.438***
Perceptions of disorder, 2002	0.332***	0.411***	0.364***	0.495***
Perceptions of violence, 2002	0.316***	0.348***	0.350***	0.429***
Boston	Mean	SD		
Vouchers, 2008	175.533	276.260		
Voucher rate, 2008	0.058	0.053		
Correlations	Vouchers 2008	Voucher rate 2008		
Perceptions of disorder, 2008	0.101	0.173		
Perceptions of safety, 2008	- 0.569***	- 0.692***		

SD = standard deviation.

*** $p \leq .001$

What Is the Effect of Demolition on Perceptions of Disorder and Violence in Chicago?

Exhibit 4 presents results from the ANCOVA model predicting perceptions of disorder and violence. Because the model controls for perceptions of disorder and violence in 1995, the coefficient for the public housing variables can be interpreted as the effect of public housing on the change in perceptions of disorder and violence. The public housing indicator is entered as two dummy variables, comparing (1) neighborhoods with public housing where no demolition occurred with neighborhoods that never had public housing, and (2) neighborhoods with public housing where demolition *did* occur with neighborhoods that never had public housing. Neighborhoods that ever had public housing vary demographically and in other ways from neighborhoods that never had public housing, so the best comparison to assess the effect of demolition is likely between neighborhoods with public housing where demolition did or did not occur. I present the coefficient for this comparison in the row “Difference between PH demolition and no demolition.”

The left half of exhibit 4 presents results predicting perceptions of disorder. Model 1 shows that perceptions of disorder declined in neighborhoods where demolition occurred compared with perceptions in neighborhoods that never had public housing and, more robustly, neighborhoods where public housing was not demolished, controlling for collective efficacy and neighborhood demographics. Model 2 adds controls for violent and property crime rates and shows that the magnitude is even greater: perceptions of disorder declined more in neighborhoods where demolition occurred. Exhibit 1 shows that, in neighborhoods that never had public housing and in those

Exhibit 4

The Effect of Public Housing Demolition on Perceptions of Disorder and Violence (Chicago)

	Perceptions of Disorder, 2002		Perceptions of Violence, 2002	
	Model 1	Model 2	Model 1	Model 2
PH, no demolition	0.003 (0.033)	0.000 (0.034)	0.012 (0.026)	0.014 (0.027)
PH, demolition	- 0.255*** (0.078)	- 0.267*** (0.083)	- 0.174** (0.062)	- 0.150* (0.066)
Difference between PH demolition and no demolition	- 0.258** (0.084)	- 0.267** (0.090)	- 0.186** (0.067)	- 0.164^ (0.071)
Perceptions of disorder, 1995	0.209*** (0.051)	0.212*** (0.051)		
Perceptions of violence, 1995			0.152*** (0.045)	0.158*** (0.045)
Crime rates, 1995	No	Yes	No	Yes
Crime rates, 2002	No	Yes	No	Yes
Constant	4.147	4.080	3.100	3.135
N	341	341	341	341
Adjusted R ²	0.764	0.763	0.629	0.628

PH = public housing.

^p ≤ .10. *p ≤ .05. **p ≤ .01. ***p ≤ .001.

Notes: All models include collective efficacy and socioeconomic controls from both years. Numbers in parentheses indicate standard errors.

where demolition did not occur, perceptions of disorder *increased* from 1995 through 2002 compared with a slight decline in neighborhoods where demolition occurred. Although perceptions of disorder remain greater in these neighborhoods than in neighborhoods that never had public housing, the gap closed from 1995 through 2002, and neighborhoods where demolition occurred did not follow the upward trend of increasing perceptions of disorder.

The right half of exhibit 4 presents coefficients assessing the effect of public housing demolition on perceptions of violence. Perceptions of violence declined more in neighborhoods where public housing demolition occurred than in neighborhoods that never had public housing and those where public housing remains, controlling for collective efficacy and neighborhood demographics. The magnitude is about two-thirds of a standard deviation of the level of perceived violence in 2002. Controlling for actual crime, perceptions of violence are reduced more in neighborhoods where public housing demolition occurred, but the difference is statistically significant only between neighborhoods where demolition occurred and neighborhoods that never had public housing. Returning to exhibit 1, although perceptions of violence decreased most in neighborhoods where demolition occurred, it remained greatest in these neighborhoods (although not significantly greater than in neighborhoods where public housing remained). Although these neighborhoods remain disadvantaged, perceptions of violence have become more similar to those of other neighborhoods.

The models in exhibit 4 also include control variables in 1995 and 2002 (not shown). Not many of the control variables significantly predict changes in perceptions of disorder and violence when the

initial level is included. Those relationships that were significant are consistent with past research. Increased collective efficacy reduced perceptions of disorder and violence. Perceptions of violence declined in neighborhoods in which the Hispanic population increased (perhaps because of the increasing presence of immigrants, which Sampson, 2008, found was associated with lower crime rates). Perceptions of violence increased in neighborhoods where poverty rates were higher in 1995. Neither measure of actual crime, surprisingly, predicted the change in perceptions of disorder and violence when controlling for initial perceptions, emphasizing that perceptions capture a different neighborhood dimension than actual crime.

Do Perceptions of Disorder and Safety Vary by Public Housing Redevelopment in Boston?

I conducted cross-sectional regression analyses examining associations between perceptions of disorder and safety in 2008 and the presence and type of public housing in Boston. I do not present them here because the results were not significant. Perceptions of disorder were not significantly different in neighborhoods with public housing or HOPE VI developments than in neighborhoods that never had public housing, and HOPE VI neighborhoods had similar levels of perceived disorder as neighborhoods with traditional public housing, controlling for collective efficacy, demographic characteristics, and real crime rates. The presence or type of public housing in a neighborhood was also not associated with perceived safety in 2008.

Data limitations hinder analyses and interpretation of the effect of HOPE VI redevelopment on perceptions of disorder and safety. The lack of longitudinal data obscures the difference in perceptions of disorder across neighborhoods with and without public housing and HOPE VI. First, neighborhoods with public housing and HOPE VI differ in many ways from neighborhoods that never had public housing, as exhibit 2 shows. Although I include control variables, the location and redevelopment of public housing is not random, so longitudinal data (as in Chicago) would better estimate the effect of public housing redevelopment on neighborhood perceptions. It could also be the case that Boston has too few cases to estimate such associations, because HOPE VI developments exist in only three Boston neighborhoods. It is unfortunate that data on neighborhood social processes exist in only a few cities and that the Chicago data were collected before HOPE VI redevelopment.

Second, it could be that perceptions of disorder did decline and perceptions of safety did increase from pre- to post-HOPE VI redevelopment but that the HOPE VI communities still do not have lower levels of perceived disorder and higher levels of perceived safety in 2008 than traditional public housing communities, because the HOPE VI neighborhoods started out as among the most dangerous in the city. It could also be the case, however, that even as crime declined dramatically as HOPE VI redevelopment occurred (Zielenbach and Voith, 2010, showed that crime rates declined by more than 50 percent in both Orchard Gardens and Mission Main), *perceptions* of disorder and danger remained high because of the lingering effects of the neighborhood's reputation on new residents' perceptions (Tach, 2009). Without longitudinal data, I cannot adjudicate between these explanations.

What Is the Effect of Vouchers on Perceptions of Disorder, Violence, and Safety?

I now turn to the relationship between the presence of vouchers in a neighborhood and perceived disorder, violence, and safety. For Chicago, I estimated ANCOVA models predicting perceptions of disorder and violence in Chicago from changes in the neighborhood voucher rate from 1997 through 2000 (not shown). Although the relationship is positive, perceptions of disorder are not significantly greater in neighborhoods where the voucher rate increased over time, controlling for initial perceptions of disorder and violence, collective efficacy, demographic controls, and when crime rate controls were added. Perceptions of violence are also not significantly related to changes in neighborhood voucher rates. I also estimated the model with the change in raw number of vouchers, and results were substantively identical. Past work on the effect of vouchers on crime rates emphasized that crime is unaffected by voucher presence unless a large cluster of voucher users is present (Popkin et al., 2012). I tested various specifications to see if great increases in vouchers significantly predicted perceptions of disorder and violence, but none were statistically significant. This finding may suggest that, because they are less visible than public housing, voucher users are not a contextual neighborhood variable that influences perceptions of safety and disorder.

Exhibit 5 presents results from regression analyses predicting perceptions of disorder and safety in Boston from neighborhood voucher rates in 2008. The left panel shows no significant relationship between voucher rates and perceived disorder. The right panel of exhibit 5 reveals that residents feel less safe in neighborhoods with many voucher households. In neighborhoods where the voucher rate is 10 points higher than an otherwise similar neighborhood, controlling for socioeconomic controls and crime rate, residents' perceptions of safety are 0.15 points less on a 3-point scale, which is nearly 1 standard deviation. Although I control for crime rates in 2008, this result could reflect that voucher users live in neighborhoods where the crime rate is increasing (Ellen et al., 2012), so recent increases in crime could make residents feel less safe. I cannot isolate an effect of voucher users on perceptions of safety apart from actual crime rate.

Exhibit 5

Perceptions of Disorder and Safety, by Change in Voucher Rate (Boston)

	Perceptions of Disorder, 2008		Perceptions of Safety, 2008	
	Model 1	Model 2	Model 1	Model 2
Voucher rate, 2008	- 0.604 (0.936)	- 1.120 (0.937)	- 2.016*** (0.569)	- 1.501*** (0.542)
Crime rate, 2008	No	Yes	No	Yes
Constant	1.989	1.738	1.679	1.974
N	89	89	89	89
Adjusted R ²	0.282	0.324	0.669	0.717

*** $p \leq .001$.

Notes: All models include collective efficacy and socioeconomic controls. Numbers in parentheses indicate standard errors.

Conclusion

The demolition and redevelopment of public housing and the use of vouchers that increased low-income residents' neighborhood mobility changed neighborhoods in many ways. Past research has focused on the effect of assisted housing on neighborhoods' property values, population composition, and crime rates. In this article, I focus on the effect of assisted housing on residents' *perceptions* of their neighborhood, particularly its levels of disorder, violence, and safety. Residents' perceptions can shape actual crime levels and residents' mobility into and out of a neighborhood. Further, perceptions may also shape residents' quality of life, mental health and stress, and social interactions. Therefore, it is important to understand how housing programs affect residents' perceptions of their neighborhood.

In addition to the *consequences*, the potential *causes* of perceptions of disorder, violence, and safety are important to understand because they reveal how residents experience their social contexts. Past sociological research shows that characteristics of neighborhoods shape perceptions of disorder in addition to—or more strongly than—actual crime or cues of disorder. This article builds on past research examining the changing perceptions of disorder, violence, and safety among assisted residents and assesses how assisted housing shapes the perceptions of residents of the larger neighborhood context. The results in this article provide evidence that the demolition of public housing is an important part of residents' social contexts that shape how they perceive their neighborhood. I find that the demolition of some of the most dangerous and deteriorated public housing developments in Chicago reduced perceptions of disorder and violence in those neighborhoods, accounting for real reductions in crime, while perceived disorder *increased* in other neighborhoods during this time. I find no significant differences, however, in levels of perceived disorder and safety between neighborhoods with no public housing, traditional public housing, and redeveloped HOPE VI projects in Boston, likely because of data limitations. Future research is needed to investigate whether residents experience neighborhoods with HOPE VI developments as a more positive social context than neighborhoods with other types of public housing.

Finally, I find mixed results regarding how the presence of voucher holders influences perceptions of disorder, violence, and safety. Evidence from Chicago suggests that an influx of voucher users does not lead to perceptions of increased disorder or violence. Evidence from Boston suggests that residents feel less safe in neighborhoods with more voucher users compared with residents in demographically and economically similar neighborhoods, although these analyses are associational and may capture the rising crime levels where voucher users live. The voucher results suggest that voucher users may not be a tangible element of neighborhood context that influences perceptions.

Policy Implications for Demolition

Despite demolition's disruption of a neighborhood's physical structure and social fabric, this study finds that residents perceive less disorder and violence in neighborhoods where public housing has been demolished, which had very high levels of perceived disorder and violence before demolition. Perceptions of disorder, violence, and safety have important consequences for neighborhood and individual well-being. Improved perceptions of the neighborhood after public housing demolition may be a key factor in the eventual revitalization of these neighborhoods, given that residents may

be more invested in keeping their neighborhood safe and attractive if they view it more positively. Results from the Moving to Opportunity experiment link improved perceptions of safety to better mental health outcomes for residents, suggesting that demolition may positively affect health through reduced levels of perceived disorder and violence. Therefore, the continued demolition of distressed public housing, at least for the most crime-ridden and dysfunctional public housing communities, may provide neighborhood and individual benefits for all residents in the neighborhood.

The data capture residents' perceptions before and after demolition, but I cannot distinguish between changing perceptions between longtime residents and newcomers or between residents living in public housing and those living in private housing. My analyses could mask longtime public housing residents' reports of more disorder because their social networks were broken up, which would suggest that demolition could have undesirable effects. It seems unlikely that is the case, however. First, most residents displaced from public housing in Chicago by demolition moved to a new home within 3 miles (NORC, 2004), so they may live in the same NC over time, in which case the data capture their perceptions before and after demolition. Second, past research on assisted residents' perceptions of disorder and violence suggests that former public housing residents rate their new living conditions more positively than their former homes. Therefore, it seems that demolition of distressed public housing can positively shape residents' perceptions of their neighborhood even as they may be displaced. HOPE VI and other programs that fund the demolition of public housing should continue to identify the most distressed and dangerous developments and communicate their demolition plans with residents to reduce feelings of uncertainty and ensure that residents feel positively about their neighborhood after demolition.

Policy Implications for HOPE VI Redevelopment

I find no evidence that perceptions of disorder and safety vary systematically among neighborhoods with no public housing, traditional public housing, and HOPE VI projects in Boston. Longtime neighborhood reputations may linger despite redevelopment so that residents of these neighborhoods still perceive their surroundings to be fairly unsafe, which could particularly be the case for newcomers (Tach, 2009). Programs aimed at fostering ties among residents may reduce perceptions of disorder to lower levels than in neighborhoods with traditional public housing, but past research finds little evidence that new social ties are easily made in HOPE VI developments, with planned public spaces left unused in part because of management surveillance (Curley, 2010; Tach, 2009). Following the thinking of Jacobs (1961), public spaces organically used by all residents for day-to-day activities (and not supervised by the HOPE VI development) may better foster social ties among HOPE VI residents and between all residents of the neighborhood. Future public housing redevelopment could also include commercial entities used by all residents of the neighborhood—public housing and market-rate residents of the development and residents of the neighborhood outside the development—to bolster a sense of collective efficacy and trust. Another strategy would be to architecturally integrate HOPE VI developments into the larger economic and institutional fabric of the community to minimize separation and distrust among HOPE VI residents and other neighbors.

Data limitations likely obscure changing neighborhood perceptions in HOPE VI neighborhoods. Longitudinal data on residents' perceptions of disorder and safety before and after HOPE VI

redevelopment in multiple cities are necessary to more thoroughly assess the effect of redevelopment on perceptions of disorder. Housing authorities and policy researchers who assess HOPE VI sites should collect data on the perceptions of all residents in HOPE VI developments and the perceptions of residents in surrounding neighborhoods.

Policy Implications for Housing Vouchers

The presence of voucher users in neighborhoods is not systematically associated with heightened perceptions of disorder or violence, despite stereotypes held about voucher users. Residents do report feeling more unsafe when more voucher users live in their neighborhood. Coupled with past research that an influx of many voucher users can lead to increases in crime (Popkin et al., 2012) and that clusters of voucher users contribute to declining property values (Galster, Tatian, and Smith, 1999)—perhaps because of perceptions about tenants' behaviors—these analyses provide more evidence that enhancing mobility with housing vouchers is imperative, not only to provide voucher users the opportunity to live in safe and beneficial neighborhood contexts but to prevent the clustering of vouchers in only a few neighborhoods. Therefore, the Housing Choice Voucher Program (HCVP) should expand mobility counseling services to provide renters with information about the range of neighborhoods available to them. In addition, the HCVP should pursue more landlord outreach and consider ways to incentivize landlord participation in neighborhoods where few voucher users live. Finally, the HCVP should consider some of the programmatic features that act as barriers to residents leasing up in neighborhoods with fewer voucher users, like short unit search times (DeLuca, Garboden, and Rosenblatt, 2013).

The transformation of assisted housing during the past several decades has profoundly changed many urban neighborhoods. This article demonstrates that assisted housing may be a crucial part of neighborhood contexts that influence not only a neighborhood's demographic composition, built environment, and crime rates, but also residents' perceptions of their neighborhoods, which shape their day-to-day lives in important ways. Policymakers must consider the effects on neighborhoods, not only individuals, when designing assisted housing interventions.

Acknowledgments

The author thanks Anthony Braga, David Hureau, and Sharon Hanson for their assistance in obtaining Boston crime data; Robert J. Sampson for his assistance in obtaining Chicago crime data; the Voorhees Center at the University of Illinois at Chicago and Edward Goetz for assistance in obtaining data on assisted housing; and Deb Azrael and Beth Molnar for their assistance in gaining access to Boston Neighborhood Survey data. She also thanks Eva Rosen, two anonymous reviewers, and the editors for helpful feedback on earlier drafts. The author completed this research while a post-doctoral fellow at the Center on Poverty and Inequality at Stanford University. All conclusions are those of the author.

Author

Ann Owens is an assistant professor of sociology at the University of Southern California.

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How Housing Professionals Perceive Effects of the Housing Choice Voucher Program on Suburban Communities

David P. Varady

Xinhao Wang

Dugan Murphy

Andrew Stahlke

University of Cincinnati

Abstract

In recent years, increasing numbers of households using housing vouchers have moved to the suburbs, following a general trend for minority and low-income families. Suburban residents often resist this in-movement because of concerns that the clustering of voucher families will lead to increases in crime and decreases in property values. Through a case study of Hamilton County, Ohio, employing both spatial analysis (overall trends for the county and distributional trends within two inner suburbs) and unstructured informant interviews with civic leaders, landlords, public officials, and fair housing advocates, this article seeks to improve the existing understanding of the level of support or resistance to the Housing Choice Voucher Program (HCVP) by these stakeholders. Although informants endorsed HCVP as a mechanism for accessing affordable housing, they expressed concern about some forms of negative neighborhood spillovers (for example, poorly maintained property exteriors, cultural conflicts, and declining school test scores). In line with recent academic writings, informants recognized that voucher in-migration often is more a symptom rather than a cause of decline. This article addresses possible ways to increase the effectiveness of HCVP in the suburbs.

Introduction

Since 1980, the U.S. Department of Housing and Urban Development (HUD) has shifted its focus from subsidizing building owners to subsidizing tenants; that is, the Housing Choice Voucher Program (HCVP). One of the program's primary stated purposes is to provide low-income renters with access to better quality housing, safer neighborhoods, and better neighborhood amenities. Academic discourse on the subject has focused in part on how well HCVP succeeds at deconcentrating poverty and desegregating racial minorities and on the real and perceived effects of voucher holders in local communities, especially suburbs (Briggs and Dreier, 2008). Many American politicians, policymakers, and citizen activists, however, fear that the movement of low-income households into their community—sometimes in conjunction with the restructuring of public housing; that is, the HOPE VI program—will result in the reclustered of households in already fragile neighborhoods where they will continue to struggle with poverty and deprivation and cause nuisances and conflict in their new living environment (for a detailed assessment of this literature, see Kleinmans and Varady, 2011).

The purpose of this article is to better understand the movement of HCVP households into inner-ring suburban neighborhoods from the point of view of community leaders, developers, public officials, and housing activists. We leave to others the task of statistically measuring the effects of the in-migration of HCVP households on suburban neighborhoods. Our focus is on two communities (Finneytown and Forest Park) in Hamilton County, Ohio. Both are experiencing racial and economic change and growing numbers of HCVP households. Using the results of informant interviews, we seek answers to the following four questions. First, why do these key stakeholders believe HCVP households are clustering in particular areas? Second, what are the perceived effects (that is, the negative neighborhood spillovers) of HCVP in suburban communities? Third, to what degree do key informants believe that HCVP is responsible for community decline or improvement? Fourth, what are the key perceived problems, if any, in the way HCVP is administered by the Cincinnati Metropolitan Housing Authority (CMHA), especially in suburban communities, and, if problems exist, what new approaches might be used to address problems at suburban HCVP hotspots?

Literature Review

HCVP—formerly Section 8—has been acclaimed by its advocates for providing low-income families the chance to improve their housing conditions and locate in safer neighborhoods with better schools (Briggs and Dreier, 2008).¹ Other observers have voiced concerns about negative spillover effects, however, which occur or are perceived to occur as a result of the in-migration of HCVP households (Churchill et al., 2001; Galster, Tatian, and Smith, 1999; Kleinmans and Varady, 2011;

¹ A growing body of literature (see, for example, Briggs, Popkin, and Goering, 2010; Rubinowitz and Rosenbaum, 2000) has documented the success of the Gautreaux Assisted Housing Program and the Moving to Opportunity for Fair Housing Demonstration Program in moving low-income families to better and safer neighborhoods and, to a limited extent, in fostering socioeconomic mobility. Because these programs are relatively small-scale experimental or demonstration programs that constrain locational choices to neighborhoods with low poverty rates or low minority populations (the national HCVP lacks such constraints), however, the two demonstrations' results are not necessarily generalizable to HCVP.

Rosin, 2008; Zielenbach, 2007).² Much of the discourse on the program has focused on whether HCVP households tend to cluster geographically and to what extent they affect the neighborhoods they inhabit.

Although some studies show evidence of the potential of HCVP to racially and economically desegregate low-income households within metropolitan areas, the consensus among housing academics and professionals seems to be that, at least in some areas, HCVP households tend to cluster together. Varady, Wang, and Duhaney's (2010) hotspot analysis (see also Wang and Varady, 2005) showed growth in the number and density of HCVP clusters within Hamilton County between 2000 and 2005. This result was echoed in Ellen, Lens, and Reagan's (2011) study of multiple U.S. cities; Galster, Tatian, and Smith's (1999) study of Baltimore; and Zielenbach's (2007) study of Baltimore, Philadelphia, and Washington, D.C.

Although evidence presented in the literature leaves unclear exactly what spillover effects HCVP households may generate for their neighbors, the predominant perception is that they bring higher crime rates, decreased neighborhood satisfaction, more conflicts among neighborhood residents, and lower school test scores, among other effects (Kleinhans and Varady, 2011). Churchill (2001) underscored the importance for program administrators of taking these claims seriously, whether or not the evidence supports them. Zielenbach (2007) echoed this call by recommending that HCVP landlords be held to stricter property maintenance standards and that tenants be held to stringent behavioral standards. Others (Galster, Tatian, and Smith, 1999; Kleinhans and Varady, 2011) recommended that administrators monitor HCVP locations and guide tenants away from vulnerable neighborhoods.

Negative perceptions of HCVP are likely to deter many landlords from participating. Some may believe that concentrations of HCVP households create negative neighborhood spillover effects on destination neighborhoods (Marr, 2005). Marr suggested that the stigma associated with HCVP affects voucher holders and landlords alike, and must be addressed by housing authority officials to involve more landlords from low-poverty areas.

HCVP researchers have argued about the extent to which HCVP clustering causes increased crime and decreased property values. Most researchers acknowledge correlation; Hannah Rosin (2008), in her article in *The Atlantic*, used the existence of a spatial correlation between crime and HCVP clustering to critique the HOPE VI public housing restructuring (which provides housing vouchers to displacees). In their response to Rosin (2008), Briggs and Dreier (2008) asserted that spatial correlation between HCVP clustering and increased crime does not prove that tenants are the source of the crime. Research by Ellen et al. (2011) suggests reverse causation—that areas experiencing increasing levels of crime tend to attract HCVP households. Zielenbach (2007) and Churchill et al. (2001) acknowledged the likelihood of causation of negative spillover effects, but they stressed that perception often overstates or misinterprets the real issues. Galster, Tatian, and Smith (1999) focused on the property values of housing units proximate to HCVP clusters; in neighborhoods that were already economically fragile, clustering was linked to property value declines.

² Of all the studies mentioned here, Churchill et al. (2001) is the only one that focused on the opinions of landlords, public officials, and civic leaders concerning the effects of clusters on surrounding areas.

Recent research (see, for example, Lucy and Phillips, 2006) shows that older suburban areas that experience decline do so for a variety of reasons, including racial shifts and an aging post-World War II housing stock. Therefore, HCVP may play a limited role in causing neighborhood change. The question, then, is how housing officials assess the role of demographic and housing change in relation to the operation of HCVP in accounting for community change, when change actually occurs.

With the exception of Churchill et al. (2001), research (particularly in relation to inner suburbs) on how key community stakeholders react to the immigration of HCVP households has been absent.³ Are their reactions—as some would argue—simply a reflection of racism, or is resistance in part a realistic reaction to urban problems spilling over into their community or broader shifts occurring in American metropolitan areas? How should local public housing authorities respond to clustering when it occurs, and how should local agencies respond to problems (possibly) caused by clustering?

The remainder of this article is divided into two parts: (1) a description of changes in the distribution of HCVP households in Hamilton County and within the two case study areas, and (2) key informants' assessments of HCVP trends and their effects.

Spatial Analysis of HCVP Distribution

This section begins with an overview of Hamilton County's demographic and housing characteristics. We then focus in on two of the HCVP hotspot communities in the county.

Hamilton County As a Whole

Hamilton County (population 800,362 in 2011) includes Cincinnati (population 296,943 in 2011) and the surrounding suburban communities. The Cincinnati metropolitan area encompasses, besides Hamilton County, three other counties in southwest Ohio, three in northern Kentucky, and one in southeastern Indiana. Hamilton County is broadly typical of older urban counties in the upper Midwest and the Northeast of the United States. The CMHA carries out HCVP in Cincinnati and the rest of Hamilton County.

Spatial analysis of voucher holder distribution throughout Hamilton County in 2000, 2005, and 2011 involved two primary methods: dot distribution and voucher density. (The detailed results of the spatial analysis are included in a previous article, Varady et al. (2012), that is available from Varady. The most striking change among the three dot maps is the increase in the number of vouchers between the 2000 and 2005 samples, from 5,032 to 10,214. The number in 2011

³ The suburbanization of Section 8 vouchers has been widely reported in the media. Take, for example, Antelope Valley at the far edge of the Los Angeles sprawl. Between 2001 and 2011, the number of HCVP recipients more than doubled to 3,500, the city changed from mostly White to two-thirds African American, and residents worried about increased crime (Medina, 2011). On July 1, 2013, the U.S. Department of Justice's Civil Rights Division announced that Los Angeles County Sheriff's Department deputies in Antelope Valley had engaged in "a pattern or practice of discriminatory and otherwise unlawful searches and seizures [related to Section 8 vouchers], including the use of unreasonable force" (Hill, 2013). Mayor R. Rex Parris vowed to work with civil rights leaders and alter attitudes (including his own) about Section 8 residents in the city. Whether the changes in attitudes of governmental officials resulting from the lawsuit will reverse or slow Antelope Valley's decline is unknown.

increased comparatively marginally, to 10,545. The overall voucher distribution appears not to have changed substantially among the three periods. The densification in some areas from 2000 to 2005 reflects the countywide increase in vouchers. During this same period, the proportion of HCVP households living outside Cincinnati increased from 26 percent in 2000, to 29 percent in 2005, and to 34 percent in 2011. Some evidence of an increase in the degree of dispersion of voucher recipients also exists. The proportion of tracts with at least one voucher household increased from 75 percent in 2000 to 89 percent in 2011. The number of census tracts that needed to be accumulated to encompass at least one-half of all voucher holders similarly rose from 26 (11 percent of the total) in 2000 to 72 (32 percent of the total) in 2011.⁴

Because multiple HCVP households living in the same or neighboring buildings may overlap and cluster in ways difficult or impossible for the eye to perceive when viewing a dot distribution map, we continued analyzing voucher dispersal throughout Hamilton County by calculating voucher densities. Using the ESRI ArcGIS Spatial Analyst kernel density tool, we created raster layers that displayed the density of voucher locations using a cell size of 500 feet, a search radius of 2,640 feet (0.5 mile), and an area unit of square miles. We chose these parameters to replicate those used in a previous study of voucher locations in 2000 and 2005 (Varady, Wang, and Duhaney, 2010). The raster layers were symbolized in classified values in terms of vouchers per square kilometer.

In addition to displaying voucher density, we identified hotspots for all three periods. Borrowing criteria from Varady, Wang, and Duhaney (2010), we defined hotspots as areas in which the density of vouchers was equal to or greater than 110 vouchers per square mile. The hotspot analysis (results not included here) suggests a complicated pattern of change for voucher densities and hotspot locations from 2000 to 2011. The number of hotspots rose, although most of that increase was because of the twofold increase in the total number of vouchers from 2000 to 2005. The total area of hotspots dropped moderately from 2005 to 2011, however, at the same time that the number of hotspots and their maximum density were increasing. The number of hotspots both inside and outside the city increased by one, but the area occupied by city hotspots decreased considerably, whereas the area occupied by hotspots outside the city increased moderately.

Although the number of vouchers in Hamilton County doubled from 2000 to 2005, new voucher holders appeared to have located largely within the same sections of the county. The most notable increases in density, however, included an area where Forest Park, Springfield Township, and Colerain Township intersect (what we call the “Forest Park area”), neighborhoods on Cincinnati’s west side, and the central neighborhoods between Over-the-Rhine, Avondale, and Walnut Hills. By 2011, those hotspots on Cincinnati’s west side and central neighborhoods appear to have decreased in size and density. Cincinnati’s northwestern suburban communities, however, including the Finneytown and Forest Park areas, experienced increases in voucher density. We now take a look at voucher clustering and the way it is perceived in these two suburban areas.

Two Suburban Hamilton County Hotspots

Although suburban Hamilton County contains a number of hotspot communities, we have chosen to focus on two of them—Finneytown and Forest Park—because of their unique housing characteristics.

⁴ We obtained basically the same results for dispersion when we used census block groups rather than census tracts.

Finneytown

Finneytown, located within Springfield Township, is most clearly defined by the Finneytown Local School District. The U.S. Census Bureau recognizes the Finneytown Census Designated Place (CDP), the boundaries of which are similar to those of the school district. The CDP is about 4 square miles and has a population of 13,687.

Finneytown shares a border with Cincinnati but is about 12 miles from Cincinnati's Central Business District. Finneytown's built character reflects its period of primary growth, between 1947 and the end of the 1970s. As an older postwar suburb, road and building configurations are automobile-oriented, but the development pattern is more compact than in newer, more far-flung Cincinnati suburbs. The dominant land use is single-family residential with areas of retail along primary thoroughfares.

The character of Finneytown changed dramatically after World War II from a small, independent town into a suburban community associated with major employers, including Proctor & Gamble and General Electric. Finneytown's character began to change again at the turn of the 21st century, as median income began to decrease and the proportion of African-American residents increased. The community currently is about one-third African American. (Hispanics comprise a relatively minimal proportion of the population in both Finneytown and Forest Park.)

In 2000, 77 voucher holders lived in Finneytown. In 2005, that number increased to 130, reflecting the overall increase throughout Hamilton County. In 2011, the number of voucher holders increased comparatively modestly, to 153. The voucher density analysis showed Galbraith Pointe at the center of the highest concentration of vouchers in Finneytown for all three periods. Galbraith Pointe is an apartment complex built in the mid-1990s and financed by the Low-Income Housing Tax Credit (LIHTC) Program.⁵ The number of voucher holders at Galbraith Pointe increased dramatically from 2000 (55 voucher holders) to 2005 (91) but decreased marginally from 2005 to 2011 (88). Voucher holders account for most of this complex's residents. In 2000, Galbraith Pointe's highest density was 86 vouchers per square kilometer; in 2005, it was 144; and in 2011, it was 139. In 2005 and 2011, Galbraith Pointe clearly met the criteria of a hotspot.

The Glencoe neighborhood exists barely beyond Finneytown's boundary but within Springfield Township.⁶ This neighborhood is characterized by post-World War II single-family homes of largely uniform and basic design. Because of their arguably unfashionable design and comparatively smaller size, they may be more difficult to sell than newer single-family homes in more far-flung suburbs. Their status makes this housing type attractive to real estate investors who acquire them

⁵ See Varady (2006) for a discussion of Galbraith Pointe as a problematic LIHTC HCVP hotspot.

⁶ Glencoe is actually part of Mt. Healthy, a suburban city facing racial change and income decline. We included the Glencoe neighborhood as part of our case study analysis of Finneytown for three reasons. First, Finneytown does not have widely understood boundaries (it is a school district rather than a town or village) and, for this reason, many people probably assume that Glencoe is part of Finneytown. Second, the distinctively unfashionable homes and the concentration of low-income families in Glencoe likely have an adverse effect on the confidence levels of residents of adjoining parts of Finneytown. Third, Glencoe stands out as a prototypical example of a single-family home HCVP hotspot. This hotspot type has received little attention in the literature, so we included this neighborhood to draw attention to this somewhat unusual type of hotspot.

as rental properties, often renting to low-income families, including HCVP recipients. From 2000 to 2005, Glencoe's housing voucher density rose from 51 to 130 vouchers per square kilometer. From 2005 to 2011, it rose further, to 133. Glencoe is a good example of a single-family HCVP hotspot.

Forest Park Area

The city of Forest Park⁷ is about 14 miles north of downtown Cincinnati, connected to the greater metropolitan area by Interstate 275, which encircles Cincinnati. Today, Forest Park is governed by a city council and administered by a city manager. It has its own police and fire departments and a community development department that oversees planning and zoning, among other things. The city is divided between two local school districts—Winton Woods and Northwest.

The land that is now Forest Park was originally designed to be the greenbelt portion of a new federally funded greenbelt town, Greenhills, formed to the south on agricultural land (Miller, 1981). After Congress passed legislation in 1949 authorizing the sale of Greenhills and other greenbelt towns around the United States, the town was sold. Its greenbelt, then called North Greenhills, was bought in 1954 by developer Warner-Kanter. Zoning changes were approved to allow for development, and the name of the area was changed from North Greenhills to Forest Park (Miller, 1981).

Forest Park was planned by its developer from its inception to be a community occupied by active residents involved in cohesive leisure and civic activities. The developer's target buyer was an upwardly mobile, post-World War II, middle-class, white-collar worker. As a comprehensively planned community, Forest Park went through several design iterations in the 1950s and 1960s to navigate the dynamic of the conflicting desires of the developer, the residents, and the civic associations and municipal government. The development initially was more concerned with the balance of residential, commercial, and industrial than with creating a socioeconomic or racial balance. Forest Park was built by subdivision, and each subdivision was fairly homogenous in terms of housing price and age. Forest Park continued to grow and, in 1961, was incorporated as a village. Soon after, in 1968, it reached city status (Miller, 1981).

Although Forest Park began as a largely White community, between 1960 and 1970 the percentage of African-American residents living in Forest Park rose from 0.5 to 2.8 percent. In 1973, in response to claims of realtors "steering" African Americans to specific city neighborhoods and Whites to others, the city council declared its commitment to fair housing practices. During the 1970s, as the African-American population continued to increase in all Forest Park neighborhoods, issues of uneven integration and fears of blight became prevalent. By 1975, the African-American population had reached about 12 percent of the total. Residents voiced opposition to multifamily housing and public housing and support for larger lot sizes to accommodate more expensive homes. Public worries were expressed that blighted areas would lead to a concentrated influx of African-American residents and the formation of African-American ghettos. During this time of change, however, the community also recognized the right of any individual to choose to live where they pleased and avoided setting quotas or seeking to implicitly segregate incoming populations (Miller, 1981).

⁷ This section describes the city of Forest Park. It is important to point out that the Forest Park hotspot includes not only part of this city but also two fairly small adjoining areas, one in Springfield Township and the other in Colerain Township.

Forest Park (population 18,720 in 2010) has become a predominately African-American suburban city. In 2010, it was 24.9 percent White and 65.0 percent African American. Furthermore, during the same time period, Forest Park experienced a growing density of housing voucher families. In 2000, Forest Park's housing voucher density was 21.24 household units per square mile, and the area that would later become a hotspot was fairly small. A dramatic change occurred from 2000 to 2005, especially at the Ashley Woods apartment complex (a gated community in Colerain Township, immediately adjacent to Forest Park). The Sevenhills neighborhood (in Springfield Township but adjoining Forest Park) also experienced an increase in voucher density during this period. From 2005 to 2011, this hotspot grew in area, now encompassing more of Sevenhills and new areas of southwest Forest Park.

As a gated community, the Ashley Woods part of the hotspot is of particular interest. In addition to providing two-story apartment buildings and townhouses, the complex includes a centralized recreational and rental office facility. Ashley Woods has a gate, which is neither monitored nor closed at night. Security measures are in place, such as a card scanner console and separate vehicle and pedestrian entrances. Also prevalent in the complex are posted signs governing acceptable behavior. One sign reads: "This property is protected and enforced by a curfew of 10:00 pm daily for any persons under 18 years of age. This curfew is strictly enforced by law enforcement personnel." A single Southwest Ohio Regional Transit Authority bus line, the #17, serves the Ashley Woods and Sevenhills neighborhoods. This route starts in downtown Cincinnati and terminates in a loop through Sevenhills. During weekdays, the route runs every 30 to 80 minutes, depending on the time of day, until about 9:00 p.m.; during weekends, it runs less frequently.

Perceptions of HCVP Clustering and Its Effects

To gain a better understanding of how HCVP operates and affects local communities, we conducted a series of interviews with key informants who are involved with or affected by the HCVP in their professional work. We carried out 13 interviews of 17 individuals between November 2011 and February 2012. Each interview was conducted in person and lasted between 30 and 90 minutes. Questions were prepared ahead of time, but interviewees had the opportunity to discuss other subjects of interest to them. We recorded the interviews and took detailed notes. Informants were chosen based on their involvement with HCVP in Hamilton County, Springfield Township, Finneytown, Forest Park, and Colerain Township. Interviewees ranged from planning academics to nonprofit advocates and from civic volunteers to public employees.⁸ We have organized the interview results around four themes.

1. **HCVP clustering.** To what extent do informants perceive that HCVP households cluster in particular neighborhoods, and if they do cluster, why?
2. **Negative neighborhood spillovers.** To what extent, if at all, do informants perceive that HCVP clustering contributes to poor housing maintenance, crime and incivilities, poorly performing schools, and racial tensions?

⁸ A complete list of the key informants is available on request from Varady.

3. **Community decline.** To what extent is the operation of HCVP believed to be responsible for community decline in the suburbs? Is decline seen, rather, as attributable to other, broader, metropolitanwide shifts?
4. **CMHA's performance.** To what extent are informants satisfied with the way CMHA administers HCVP in the suburbs? What specific complaints do they have and what are their suggestions for improvement?

HCVP Clustering

Discussions with informants about the spatial distribution of vouchers in Hamilton County proved to be surprisingly complex. Informants disagreed on whether voucher recipients were or were not dispersing throughout the county. They also disagreed about what constituted HCVP clustering. Some thought that the jurisdiction or community was the appropriate geographic unit for defining concentrations, but others wanted to focus on the level of block or particular apartment complex.

A fair housing advocate discussed the problem of choosing an appropriate geographic unit with which to define spatial concentrations. She pointed out that an apartment complex may rent predominantly to voucher holders, but it could exist within a larger, predominantly upper income community. She wondered whether the complex should be considered a concentration—and a problem—if the jurisdiction as a whole has a relatively minimal proportion of voucher holders.

Even our [Cincinnati's] big apartment complexes are small compared to other cities. ... You need to look at the mix in the schools and the grocery stores. ... It's really the community mix [that is important] rather than whether there are too many [voucher holders] on [any] one street or not.

A Finneytown Civic Association leader similarly argued that the proportion of voucher holders at the level of Finneytown as a whole was more important than at any one street or apartment complex.

Are we really going down the tubes here? Is Section 8 taking over? It turns out that it's not. There are roughly 5,000 living units in Finneytown and there's, at last count, 146 Section 8 rentals. ... The percentage is like 2.7 percent, which is not a big deal. ... We're not going down the tubes like many, many other neighborhoods are. We're holding our own.

A Finneytown landlord who rents to many voucher holders argued for the existence of a tipping point, a threshold beyond which the rate of community decline would accelerate.⁹

Somewhere between 10 and 25 percent there's a tipping point that a resident who is a working resident gets a feel that "this isn't for me anymore, this is for poor people." Again, this is a perception of others as it relates to your community. So if you [as a landlord] take a voucher holder or two, it's no big deal.

⁹ Similarly, housing researchers George Galster (2005) and Kirk McClure (2010) have used the tipping point concept to analyze the dynamics of high-poverty and high-housing-voucher-density neighborhoods.

A Forest Park public administrator also highlighted the tipping point concept, but went on to note the effects of an uneven voucher distribution within Forest Park (where the tipping had occurred), that neighborhoods containing higher proportions of vouchers had become “service burdens.”

We speak a lot here about community standards and they are definitely there. We spend time and effort at enforcing those standards, but the whole enforcement of them was less necessary in past years, because it was basically the social pressure, if you will, of keeping that up. And that’s why I think the distribution is important. We spend a lot more of our code enforcement effort [in the section of the city with more voucher residents]. There are streets [with fewer voucher residents] where we barely have to go onto, because you have a community standard that is being upheld without any effort from the municipal government. . . . These are the community standards that we and our city council are trying to uphold. There will come a tipping point at some point where it’s not the community standard anymore and we’ll have enough residents saying “No, you shouldn’t be having us take our garbage cans in” or “You shouldn’t be telling me I have to paint the house.” At some point litter[ing] is going to become the norm.

A Springfield Township official similarly emphasized not only looking at subneighborhoods rather than jurisdictions, but also the need to limit HCVP migration flows into particular subareas. Current HUD regulations preclude doing this, that is, limiting migration to a certain area. HCVP recipients can move wherever they like as long as they find a landlord willing to rent to them.

An obvious solution to us was to, not necessarily maybe even limit the number that a community can have, because if you still wanted to allow people to go wherever they wanted to go you could do that, as they do now, but to say, “You should limit the number of housing choice vouchers that are allowed to be in any one census tract or block group.” That way you would prevent this type of clustering.

Why do HCVP families cluster in HCVP hotspots? CMHA informants argued that the availability of rental housing that meets the Fair Market Rent standard determines where voucher holders will locate. Communities that do not offer affordable rental housing cannot accommodate voucher holders.

Anderson Township [a mostly middle-income area to the East of Cincinnati] is 90 percent single-family residences. And I think there’s like 5 or 10 vouchers in Anderson Township and sixteen thousand housing units. Westwood [a neighborhood on Cincinnati’s West Side] is about 60-percent rental. Nobody planned this, but Anderson Township developed as single-family ownership and Westwood developed as apartments and those apartments meet the rent standard and without anything—CMHA doesn’t do anything—that’s where the apartments are. That’s where the lower cost apartments are.

Some informants mentioned that voucher holders may be more likely to locate in larger apartment complexes rather than smaller rental properties because of the process involved for landlords in participating in HCVP. As one CMHA representative explained—

Sometimes larger apartment communities are just more willing to accept the voucher than maybe a small “mom-and-pop” unit because there is a lot of red tape, and the

process is slowed down a little bit—the approvals that need to be done and the inspections and all of that. And some mom-and-pop single-unit owners aren't necessarily interested in participating in the voucher program. They have that right to do that, and in the larger apartment communities they have a better understanding of how the program works and they know how to work with us.

A Finneytown landlord indicated that properties financed using a LIHTC are substantially more likely to accept vouchers and to accept higher proportions of vouchers, because of the tax credit's requirements and financing structure. By contrast to conventionally financed rental properties, owners of LIHTC-financed properties are not allowed to turn away HCVP households based on their using vouchers.

A conventionally financed property [owner] can choose not to accept a Housing Choice Voucher holder. A Section 42 [LIHTC] financed property, by deed restriction, is required to accept Section 8 voucher holders. [This statute] doesn't require that every voucher holder that knocks on the door is rented to, but you have to accept the application. And you still have rental criteria that you can use to pick and choose who you would rent to.

HCVP consequently serves as a means for landlords of LIHTC properties to meet the tax credit's tenant income ceiling requirement while charging more rent than tenants in that income bracket would otherwise likely be able to pay. The unfortunate consequence of these LIHTC regulations is to promote income and racial segregation at the project level.

Spillover Effects

We asked informants about some of the spillover effects often attributed to HCVP, such as increased crime, culture conflicts, poor housing conditions, and declining school performance.

Crime

Crime turned out to be less of a problem than expected. A CMHA representative simply dismissed the possibility of a link between housing vouchers and crime.

There's no evidence that says there's any higher crime in public housing or housing choice vouchers. There's nothing that says that occurs. That's [just] a perception.

During the early 2000s, Galbraith Pointe was in a state of turmoil because of an increase in crime. In April 2006, Chevis Jackson, who was a sophomore and star athlete at Finneytown High School, was shot to death during a gang dispute in the parking lot of the complex (Varady, 2006). He was an innocent bystander. In June, his mother sued Galbraith Pointe for not providing adequate security. For budgetary reasons, the complex had stopped hiring off-duty police officers to patrol the property earlier in the year (Horn, 2006).

The fact that our informants did not prominently emphasize crime may have been because of recent policy efforts. A Springfield Township police officer mentioned Finneytown's Galbraith Pointe but said that crime no longer was a serious problem.

Galbraith Point—we don't have any more runs there than we do at any other apartment complex. . . . I don't know what the exact numbers are of voucher recipients there versus ones that are not. . . . It's a lot quieter now than it was when they first opened. . . . There are not a lot of problems there. There really isn't.

The Springfield Township police officer explained that when crime occurs at a voucher-assisted housing unit, the department shares the information with CMHA using a system that has served as a model for surrounding police departments. "Early on, when we identify a location where there [are] a lot of issues, it gets taken care of pretty quick [sic]. [CMHA removes the voucher] and we have no more problems there." This officer went on to explain that—

[CMHA is] really stringent on drug activity. If we do an investigation and we find that there's drug sales and drug-related violence at a location, they're quick about it. They'll do the immediate termination hearings and things like that.

CMHA's screening procedures may also help to minimize crime. One Finneytown landlord who accepts HCVP households relies on his own tenant-screening process and on CMHA's process to ensure low levels of criminal activity at his properties.

I screen my tenant very thoroughly and so do they [CMHA]. There are no drug dealers and criminals and sex offenders living in Section 8 housing. I don't think a lot of people understand that. If you've got a stack of stuff on your record, you're not getting a voucher.

Culture Conflicts

Considerable consensus existed among informants that lifestyle clashes sometimes occur between newly arrived HCVP recipients and long-term owner residents. Whereas CMHA representatives and fair housing advocates tended to explain away these clashes, however, landlords and public officials saw them as an obstacle to long-term community stability.

According to one fair housing advocate, culture clashes sometimes occur because of differing yard space usage habits.

If you've lived an urban lifestyle and you're having a cookout, you do it in a very public place and the neighbors understand they can come over. . . . [However, if you are a voucher family and] you try to have a cookout anywhere but hidden in your back yard in a suburban neighborhood . . . people are all over you. You know, just understanding the difference between the front yard and the back yard and how you use those different spaces, I mean, it's very different.

This same fair housing advocate alleged that neighbors of voucher holders in suburban settings have been known in some cases to excessively report their voucher holding neighbors to the police based on assumptions of criminal activity because of differences in yard maintenance and noise standards.

Other informants were more explicit about the kinds of social conflicts between neighbors that suburban residents have attributed to voucher holders. A Finneytown Civic Association representative mentioned that, within his community, resistance to HCVP has largely been voiced by unsubsidized

residents living in close proximity to voucher holders, who most typically cite litter and loud noise in their complaints. He said, “We have had some rough Section 8 people that would play their music loud, be a little belligerent, litter a lot, that’s about it.” These complaints are reminiscent of those made by middle-class gentrifiers in Harlem (New York City) (see Freeman, 2006); and Bronzeville (Chicago) (see Pattillo, 2007) about their lower income rental neighbors.

Other informants complained about loud music, yelling from a parked car to a house, and shouting during domestic disputes. One Finneytown landlord who works with HCVP explored this cultural divide between socioeconomic classes in dealing with domestic conflict.

Because they [HCV recipients] are coming from a lower socioeconomic class, they deal with conflict in a different manner than perhaps [would be true for a family coming] from an upper or middle class upbringing. ... If you are from that poor family, whether its white, blue, green or black, you deal with it differently. It’s bravado, it’s a push back, and that creates a sense [for the neighbor] that “I wouldn’t want my daughter living there.”

CMHA recognizes the existence of these culture clashes by carrying out its own orientation program for HCVP clients.

When we do an orientation, we try to help individuals prepare to be a good resident, to be a good community person. Different levels of skills, living in a community, living as a renter, there’s different skill levels. Some of the people we give vouchers do better than others.

Whether these orientation sessions are thorough enough to prevent culture clashes is an open question.

Substandard Housing Conditions

Our key informants cited the physical inspections regularly undertaken by CMHA and rejected the widely held belief that voucher homes are not well maintained. A Finneytown landlord said—

They inspect the houses. The run down, nasty looking houses with the broken front porches and rotten stairways and falling apart gutters, those are not Section 8 houses. They would never pass. You have to have a house in nice shape. ... When people see a run down house, their first thought is, “Oh, that’s probably a rental.” A lot of times it’s not. A lot of times a run-down house is owned by an owner-occupant who just can’t afford to keep it up for whatever reason.

One high-ranking CMHA representative explained the housing conditions inspection this way—

We do inspections every year for every apartment and we basically make sure it’s livable. And so if it’s not livable the landlord has to correct it and if the landlord doesn’t correct it, we’ll stop paying rent. The person still holds the voucher but we tell them that if the plumbing’s not working or there are safety issues, we’ll just say, “You can’t live there anymore, you have to move.” We will not pay the rent on a sub-standard living arrangement.

Nevertheless, many of our informants (other than CMHA staff) believed that, even if voucher houses met program standards, often they were not kept up—especially on the outside—as well as those

that were owner occupied. Problems included overgrown lawns and garbage, toys, and junk cars left outside. A Colerain Township administrator asserted that voucher holders were generally less likely to maintain their properties than neighboring homeowners.

Many times ... a voucher person will move into a neighborhood [and] they're not used to taking care of a single-family home. ... With our property maintenance code and [their not] cutting grass and [their] not [putting] garbage out, we see many times that these involve voucher homes.

A Springfield Township official echoed this concern: "They [HCVP-rented units] are six-to-seven percent of the total households in the township [but] they represent about ten-to-eleven percent of the total code violations that we have, on average, every year."

A public administrator from nearby Forest Park distinguished simply between renter-occupied and owner-occupied housing when making a similar claim for his jurisdiction.

The effect is there is often a noticeable difference between a house that's owned by an owner-occupant, and a landlord, and it's obvious, but it's also sometimes a little bit subtle. It's the difference between planting flowers or not planting flowers, mowing the lawn once-a-week or every-other-week, fixing small things on a timely basis versus waiting until either the tenant complains or we bring it up.

A CMHA representative acknowledged the previous points but claimed that housing conditions might be even worse in suburban communities like Finneytown and Forest Park if HCVP did not exist.

[Under that scenario] you're going to have landlords who are going to be forced to accept less rent, because they can't rent their properties because people don't have the means to be able to pay the rent. So this program gives landlords the ability to charge Fair Market Rent and have money to put back into their properties and keep them up to standards and improve them in many cases. If those dollars weren't available, I think you'd see a steady decline in some of the housing stock.

This argument would probably provide little comfort to a homeowner adjoining a poorly maintained HCVP property.

Schools

One effect of HCVP in suburban areas is the influx of children from more disadvantaged families into school systems that had previously been predominantly middle class. Many of the communities, like Finneytown and Forest Park, that have experienced an influx of HCVP households were already undergoing racial change. Administrators from the Finneytown Local School District spoke of the opening of Galbraith Pointe. As an LIHTC property that rents disproportionately to voucher holders, Galbraith Pointe brought many disadvantaged children into the school district who were more transient, who performed below grade level, and who were culturally different from children already in the school district. The school district adapted by implementing new cultural training for the school staff, making changes in school curricula, and implementing programs designed to

meet the needs of children from poorer families. The nearby Northminster Presbyterian Church also developed new after-school and summer programs in response to changes in school population demographics.

Two Finneytown school officials described the changes that the district had made in curricular and disciplinary policies, but they emphasized that they were a result of changing demographics in general and not HCVP in particular.

A Finneytown Civic Association representative thought that racial tensions and disciplinary issues were the main schooling issues.

In school, I think there's some friction between the kids. The only fights that [this informant's son] ever got in were with Section 8 kids, and they weren't serious. I think there's an attempt at some bullying, but there's enough kids around to say, "What the hell are you doing?" and eventually that stops. It's pretty much one way [the bullying]—[it's the] Section 8 kids. That's part of a culture I think that says: "You've got to look out for yourself and you've got to look out for yourself even if somebody's not threatening you."

Race is a dynamic that influences discussions of HCVP within any number of subtopics, but the subject was raised prominently in connection with school issues. A Springfield Township administrator explained the public perception issue as it relates to HCVP and race, within the context of the Finneytown schools.

You see kids that undoubtedly live at Galbraith Pointe, because you see them going back to there walking from the high school to Galbraith Pointe. You know, young, minority kids with their hat backward and their pants down, people automatically assume that they're doing something illegal. It's a perception issue.

This civic association representative also spoke of an apparent racial divide among students that has become apparent since the influx of African-American children into Finneytown.

Right after school, you see a bunch of white kids here and a bunch of black kids over there and there's a little mingling on the fringes. It's not like they're all together. And I was always uncomfortable with that.

Key informants differed regarding whether flight from local public schools was or was not race related. The Finneytown Civic Association representative estimated that maybe 20 percent of households moving away from Finneytown during this period were motivated by voucher holder immigration into Finneytown, a motivation that this informant characterized as race based. On the other hand, the Forest Park administrator asserted that this flight was not race based, it was instead a response to declining school performance, which in turn reflected growing proportions of economically disadvantaged and transient children in the school district.

We will not be able to resolve this question of whether middle-class flight from inner-suburb schools is or is not racially motivated. What is clear, however, is that unless methods are developed to slow flight, but more importantly to sustain middle-class interest in public schools serving these areas, community decline is inevitable. We now turn to a more direct discussion of this subject: the effect of HCVP on community decline.

Does HCVP Cause Neighborhood Decline?

Our interviews and the academic literature on housing vouchers (see, for example, McClure, 2010) raise the question: To what extent is HCVP a cause of neighborhood decline above and beyond other factors? Our informants suggested other causes of decline, including the influx of investor owners of rental properties and the growing undesirability of the early postwar single-family housing stock. Ellen et al. (2011) made precisely the same point: that the influx of HCVP tenants is typically a symptom rather than a dominant cause of decline.

Some informants referred to investor landlords playing a key role in the decline of particular Cincinnati suburban communities. According to a Forest Park public administrator, the recent wave of foreclosures depressed housing values and made properties in that jurisdiction more attractive to investor landlords, many of whom rent to voucher holders.

In the past few years ... you've had the foreclosure and housing crisis. ... That did a couple of things. It depressed the prices that people could get, the extra inventory made it more difficult for people to sell houses, and so what we had was a lot of investors purchasing houses. Now some of them came in, put some work into the house, and then put it back on the market. Others were landlords [who were] focused on Section 8.

This administrator also theorized that (1) investor landlords would not find a profitable business in Forest Park if not for the subsidy that HCVP provides, and (2) the investor landlords operating in Forest Park in recent years have brought problems to Forest Park by way of their poor experience and skills as landlords.

I wouldn't go so far as to say this [HCVP] has had a negative effect on the community, but again, I think it's drawn in real estate investors that, again, are not real good at it [sic]. And without this subsidy, I don't know that they would have ever been doing that. And not all of these people [the landlords] are using Housing Choice Vouchers, but what [the subsidy does is] raise the floor on the rental price for a single-family house.

A Springfield Township police officer noted a similar wave of foreclosures in Finneytown, which has attracted investors, many of whom are renting single-family homes to voucher holders. A Finneytown Civic Association leader similarly speculated that about 25 percent of the foreclosed homes in Finneytown's southwestern section (the hardest hit area) would be turned over to voucher holders.

A Finneytown landlord acknowledged that investor landlords tend to purchase single-family homes in areas where property values have decreased enough for the investor to make a profit in renting or reselling the house. He went out of his way, however, to emphasize that investor landlords are a symptom, not a cause, of change.

In some ways the purchase of these properties by landlords is a symptom of a different situation. It's a symptom of changing demographics and changing economics in that community. If there were still lots of white middle-class people to buy the houses in Finneytown, and [who] wanted to live in Finneytown, then those houses wouldn't have become run down properties that were in the price range that investors can buy, because investors

can't buy full price houses and make money. So it's only when the houses start to decline in price because they've declined in quality ... there's no longer the market to buy them at the higher price. So I use the phrase that the investors are a symptom of something, of that change, whereas the perception is we [the investors] came in and brought down the values of the neighborhood. The reality, I think, is we came in while the values were already down and it started a cycle that continued.

The growing undesirability of the single-family housing stock in inner-ring suburbs like Finneytown is a major cause behind socioeconomic decline in those communities. One CMHA representative further explained that many landlords who participate in HCVP are former owner occupants who found they could not easily resell the house in which they used to live and for which they also could not easily attract a market-rate tenant.

A Springfield Township informant referred to older, mid-20th century single-family homes as “low hanging fruit” for investor landlords. This phenomenon was corroborated by a CMHA administrator, who explained that—

I think, if I remember correctly, voucher holders choosing to move there [Finneytown] is because a lot of the homes—the single-family homes—they're slab houses with no basements. They're just less desirable, I think, for homeownership now ... the trend has been for those to be turning more toward rental. When people in this area are buying a home, they want a basement.

Another CMHA representative present at this interview added—

You see investors picking up more of those types of homes. They're owned by investment groups. You don't typically see an investor picking up a \$100,000 home and leasing it out. You know, those are more [likely to be] owner occupied.

The Springfield Township representative explained that the housing stock in Finneytown was largely built to meet middle-class standards of the 1960s and 1970s, and that families of that status now prefer newer housing in more far-flung suburbs like West Chester (a rapidly growing suburb at the northern edge of the metropolitan area, on the other side of the Interstate 275 ring road). This change in housing preferences has decreased property values in Finneytown even further, making them affordable to lower income owners and renters.

A lot of it [the decline] is just because it's an older housing stock and there's really not a market for it anymore, and it's sort of ripe [for the] picking for a Housing Choice-Voucher type program because the person moving out of Winton Terrace [a neighborhood near to the city center] or out of the urban core and moving into one of those two or three bedroom Cape Cods—to them, that's like moving to West Chester. But to the Finneytown resident who lived next door to that house for thirty years and Miss Jones owned it and planted flowers every spring in the flower bed and now she's died and no one else wants that house, and someone who's never owned a house before comes and lives in it, doesn't take care of the bushes, doesn't cut the grass regularly, you know, barbecues in the front yard, that's a big change from Miss Jones, who planted flowers every spring. And every situation like that gets labeled Section 8.

A Finneytown landlord emphasized the fact that declining property values have made single-family homes in inner-ring suburbs like Finneytown accessible to voucher holders. Moreover, property value decline has accelerated in neighborhoods in which the housing stock was built using lower quality construction materials and shoddy methods.

That's a big misperception—what caused the influx of these poor subsidized housing tenants. The neighborhoods were already in decline before investors started buying up the property. And part of it is, some of that stuff wasn't built all that good [sic] to begin with. [This was] not premium quality construction. Some of the houses in these neighborhoods, they weren't built with two-by-fours, they were built with two-by-threes, press board walls, aluminum wiring, really simple features, small rooms, concrete slabs, no garages. Some have car ports, some don't.

Thus, changing middle-class tastes in single-family housing, an aging single-family housing stock, and continued single-family development at the metropolitan fringe all contribute to the decline of inner-ring suburbs like Finneytown and Forest Park. Continuing decline in many inner suburbs is therefore inevitable. Programs to limit the entry of HCVP families into such areas after the proportion exceeds a specific tipping point would not work unless ways are identified to make these areas more attractive to White, middle-class families with children.¹⁰

How Well Is CMHA Administering HCVP?

CMHA officials viewed HCVP more favorably than did landlords and community officials. CMHA representatives stressed that their primary obligations were to the federal government and to the voucher holders, rather than to landlords and communities. They noted that the program was being run well, in accordance with HCVP guidelines; so well, in fact, that CMHA had achieved a score of 145 out of 145 in the most recent Section 8 Management Assessment Program (SEMAP).¹¹ A CMHA official similarly added: "We're a high performer. We meet all the HUD standards. It's an excellent operation." CMHA's high performance rating stands despite criticisms from public administrators and landlords because HUD and local informants are using different criteria of effectiveness. The subsections that follow speak to the deficiencies raised in interviews.

Public Relations

CMHA's inability to build and maintain positive public relations in suburban communities in regard to its administration of HCVP was a source of complaint for many informants. One Springfield Township official, recalling a 2009 meeting that CMHA officials attended in Finneytown, remembered that CMHA administrators were overly defensive when discussing HCVP.

¹⁰ A Finneytown resident offered a novel twist to this argument, favoring a quota for HCVP households. According to the informant, the number of voucher families needed to be restricted, because they tended not to become involved in school activities or to work for the passage of school levies.

¹¹ According to HUD, SEMAP "measures the performance of the public housing agencies (PHAs) that administer the Housing Choice Voucher program in 14 key areas. SEMAP helps HUD target monitoring and assistance to PHA programs that need the most improvement" (HUD, n.d.).

Overall, it's my opinion that CMHA doesn't recognize or doesn't admit the problem of the clustering of these units in suburban neighborhoods. We've had them out here for meetings before to explain the program to the public and to answer questions, and they get defensive really quick. As an organization, I don't know that they readily admit or subscribe to the perception.

On the other hand, CMHA officials thought that meetings had gone well and that the authority was proactively fostering community dialogue concerning HCVP.

We don't always wait for them to request [a meeting]. We do proactively outreach [sic] to community councils and civic associations, however, there's a fine line there because essentially you're saying we want to come talk to you, but sometimes they say, "No thank you!", and you don't get the opportunity to present at their meeting and other times you do. We reach out and let them know we're here, that we'd be happy to come out and educate.

Red Tape

Two Cincinnati-area landlords who had extensive experience with HCVP and who managed rental properties in Finneytown stressed the difficulty of navigating the program's red tape. To the landlords, the process of accepting a voucher involves not only added paperwork and communications with CMHA officials, but also delays in moving tenants in and receiving rent payments. One landlord complained, "They're a very difficult agency to work with. They are slow, cumbersome." He did admit, however, that the obvious benefit of HCVP from a landlord's perspective is that after the tenant has moved in, rent payments are guaranteed regardless of the tenant's employment status.

It adds a month to the cycle of getting a tenant approved. I've got to wade through all their paperwork and they're very inefficient. But if I have a tenant who is Section 8 and they get laid off, Section 8 picks up the rest of the rent. ... If they're a market rate tenant and they get laid off, they're pretty well done.

The same landlord complained about the lack of a partnership relationship between CMHA and landlords in implementing HCVP.

They don't treat the property owners as clients. To them, the tenant is the client and we're just this service provider, so we are not appreciated as a key part of their business model. The fact that their tenants and their program cost us a lot of money—they don't care.

Another voucher-accepting landlord, who manages rental property in Finneytown, echoed this sentiment.

CMHA, in administering the program, in my opinion, perceives their customer as the voucher holder—not the landlord, nor the community [where] the properties reside. And, to that end, they shoot themselves in the foot. The voucher concept is ... very problematic, full of prejudice—community prejudice—[a] hot potato. You need to perceive me as your customer, because without me ... you have no program. If I won't take your voucher, there will be no one to take your voucher.

The solution to this relationship dilemma, according to this landlord, is that caseworkers be assigned to landlords in the same way that they are assigned to voucher holders. He mentioned that upper level representatives from large, national property management firms with large apartment complexes (such as Towne Properties in Cincinnati) can contact upper level CMHA administrators and receive attention, but landlords of smaller properties do not have this same access.

Accepting Responsibility

It is clear based on informant interviews that CMHA accepts the responsibility to regularly inspect the homes in which voucher holders reside to guarantee their proper structural condition. It is also clear that local police departments accept responsibility for monitoring criminal activity and for sharing that information with CMHA, whose staff have the responsibility for removing offending voucher holders from the program. The question of who is responsible for dealing with cultural conflicts among neighbors and for exterior property maintenance issues, however, has not yet been adequately resolved.

According to a CMHA official, mitigating public nuisance violations, such as noise levels and yard maintenance, is the responsibility of a landlord, because such issues are violations of lease agreements between the tenant and landlord and are not the responsibility of CMHA.

[Nuisance calls against a voucher holder are] not our responsibility with this [CMHA-landlord] contract and it's not our responsibility with this [CMHA-tenant] contract. Now, if there are some other violations like drug violations, ok, we're pulling the voucher.

Another CMHA official explained that the housing authority does actively mediate between local public administrators and HCVP landlords but stressed that the responsibility for nonstructural code issues lies with the landlord.

Our inspections department works with local municipalities as far as building code violations. They provide us with a list if one of our properties ... has any code violations. ... If it's a complaint that deals with lease enforcement, then we explain to the landlord that lease enforcement is the responsibility of the property owner. We try and educate our property owners as well: "Look, you need to make sure that you are not an [absentee] landlord. If the responsibility is of the family to [maintain] the exterior, you need to drive by and make sure they're doing that."

Among the public administrators we interviewed, this answer was not satisfactory. They cited the difficulty in working with landlords on correcting code violations and the inability of CMHA to productively participate in the correction process. A Colerain Township official said—

One of the frustrations that I've seen in the time that I've been here is it seems that [CMHA's] responsiveness to me has gone down. And it's a process and we've worked with them. But when I have a landlord that's not taking care of their property, they just say to me now "Well you just have to deal with that landlord." ... Those [HCVP] landlords are very difficult to work with, and CMHA gives us very little support.

An official from the nearby Northwest Local School District also complained about CMHA's inability to influence HCVP landlords to correct code violations.

There's very little control they have over the landlords, and I think that's what the communities are most concerned with. Why don't they have a little more concern and control over them?

A Springfield Township administrator suggested that CMHA deny vouchers to residents on the basis of code violations or that CMHA require landlords to register their property as rental homes. Such requirements would make landlords easier to track down by code enforcement officials. Such a landlord registry is currently used in Minneapolis (Krueger, 2010).

Baby Steps Toward Housing Voucher and Poverty Deconcentration

Although CMHA has taken steps to promote broader housing choices—which would prevent the emergence of HCVP hotspots—these efforts have not been as energetic as they could be. A CMHA representative ticked off the types of assistance provided to voucher families.

We have a website [<http://www.gosection8.com>] that provides a listing of all available housing that property owners can register for and for program participants to lease. . . . We have a kiosk area on site at our HCV administrative offices where families can access that site and print off listings. We also encourage families to check local newspapers for rentals and check other local publications—Craig's List, Apartment Guide, for-rent magazines. "Don't limit yourselves to just looking at what we provide and what property owners have listed on our website as available units. There are other opportunities through other avenues."

This CMHA administrator explained how the housing authority may refer a voucher holder to the local nonprofit fair housing organization, Housing Opportunities Made Equal (HOME), which maintains a program for assisting voucher holders in finding housing.

We also have a mobility program with Housing Opportunities Made Equal. We refer clients to HOME if they're looking to move outside of the city limits, and they have a mobility specialist that will work with that family to find housing in the areas that they are seeking.

Although HOME can provide families with more choices, the agency cannot force families to move to areas with low poverty rates or low minority populations.

A CMHA administrator explained that the housing authority is authorized to take steps that utilize the HCVP to deconcentrate poverty in Hamilton County.

We have a deconcentration plan. . . . We try to find a way to say "let's get more landlords from areas of the city that don't have a lot of vouchers, let's go out and actively try to do that." . . . If you focus on something [wider choices] you should be able to move the needle a little bit. We just need to focus there.

To recruit landlords in areas of lower poverty concentrations, CMHA is authorized to pay higher rent vouchers in these areas. The CMHA administrator was careful to note that this policy did not constitute steering.

We can pay as much as 110 percent of the Fair Market Rent in low poverty concentration areas. We don't do that a lot, but we can do that. We also can do a mobility deconcentration plan where we try to recruit landlords where there are areas of lower concentrations. We can't do [it] wholesale. By all means we can never do anything called "steering." We can never say, "This voucher is only good for this neighborhood."

A Colerain Township official voiced opposition to CMHA's use of rent exception areas, claiming that the housing authority designated those areas using old data. Because CMHA continued to use 1990 census data to determine an area's level of poverty, (a point in time when there were few in-migrating poor families), the housing authority was encouraging voucher holders to move there as part of a deconcentration plan. The Colerain Township administrator had in mind the Northbrook area of the township.

I definitely think that exception area is antiquated, using outdated data, and it amazes me that they're still using it [given that it is] basically [being] inundated with voucher [recipients].

The preceding suggests the need to use up-to-date data to monitor community change and to supplement census data with other relevant information (for example, school enrollment data) wherever possible.

Conclusion

The aim of this article has been to explore the views of Hamilton County public officials, landlords, housing activists, and civic leaders concerning the link between HCVP and negative neighborhood spillovers (for example, crime and property maintenance standards) in the inner suburbs. We have placed these interview results in the context of broader city-suburban shifts in HCVP in Hamilton County between 2000 and 2011 and in the context of the particular changes that have occurred in Finneytown and Forest Park, two racially changing suburbs. This article is meant to supplement empirical studies of the neighborhood spillover effects (for example, on property values, see Galster, Tatian, and Smith, 1999) and large-scale surveys of voucher recipients' ability to achieve better housing and neighborhood conditions (see, for example, Varady and Walker, 2007).

The story of community change in the suburbs proves to be a complex one, within which HCVP is only one player. Most informants endorsed HCVP as an efficient and effective way to provide good-quality, affordable housing. The interviews, however, spotlighted a number of perceived problems associated with an influx of HCVP households into inner suburbs: cultural clashes between neighbors, poor exterior maintenance, and poor school performance. It is significant that several of our informants noted that HCVP may be more properly viewed as a symptom, rather than a cause, of community decline in inner-ring suburbs. Academicians like Ingrid Gould Ellen have come around to the same viewpoint in recent years. That is, HCVP families are drawn to areas that were already experiencing low levels of demand because of racial change and an aging housing stock. Middle-class families simultaneously were being drawn away to the metropolitan fringe, where new homes and more prestigious public schools were the norm. Reversing or slowing community decline in this type of suburban environment will not be easy.

Five sets of policy implications may be derived from this study. First, housing authorities like the CMHA need to find ways to hold participating landlords accountable for local code violations such as noise and inadequate property maintenance. As one public administrator suggested, simply requiring HCVP landlords to comply with Ohio state regulation—that is, to register their property as rental housing—would make landlords easier for code enforcement officials to contact. Second, housing authorities need to emphasize the importance of educational outreach and public relations, which would include stressing the authority's strict screening policies against drug use and criminality. Third, housing authorities need to view the HCVP landlord as a client, just as they view the HCVP recipient as one. One promising approach is to assign a caseworker to each landlord, just as authorities assign caseworkers to HCVP recipients. This strategy would ensure that landlords can have a consistent point of contact with the housing authority while participating in the program. Fourth, housing officials need to use current census, schooling, crime, property value, and other information to monitor possible neighborhood spillover effects. Finally, housing authorities need to work with school districts and local governments to help school districts meet the needs of lower income children living in HCVP units. These programs, if adequately funded, could slow the pattern of decline in these communities.

We offer these recommendations cautiously because (1) some of them are resource intensive at a time when HUD's current level of funding is under severe threat, and (2) the suggestions are based on a small sample of officials from one metropolitan area. A need clearly exists for further research involving a wider range of cities and regions assessing housing officials' perceptions of HCVP spillover effects.

Acknowledgments

The authors thank (1) the Hamilton County landlords and housing officials whom we interviewed (2) the anonymous *Cityscape* reviewers, and (3) the OTB Research Institute for the Built Environment, Delft University of Technology, for providing Varady an ideal setting for completing this article, as Visiting Scholar, May to July, 2013.

Authors

David P. Varady is a professor in the School of Planning at the University of Cincinnati.

Xinhao Wang is a professor in the School of Planning at the University of Cincinnati.

Dugan Murphy is a graduate of the Master's in Community Planning Program at the University of Cincinnati.

Andrew Stahlke is a graduate of the Master's in Community Planning Program at the University of Cincinnati.

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

Michael C. Lens

University of California, Los Angeles

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 unsubsidized 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

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.

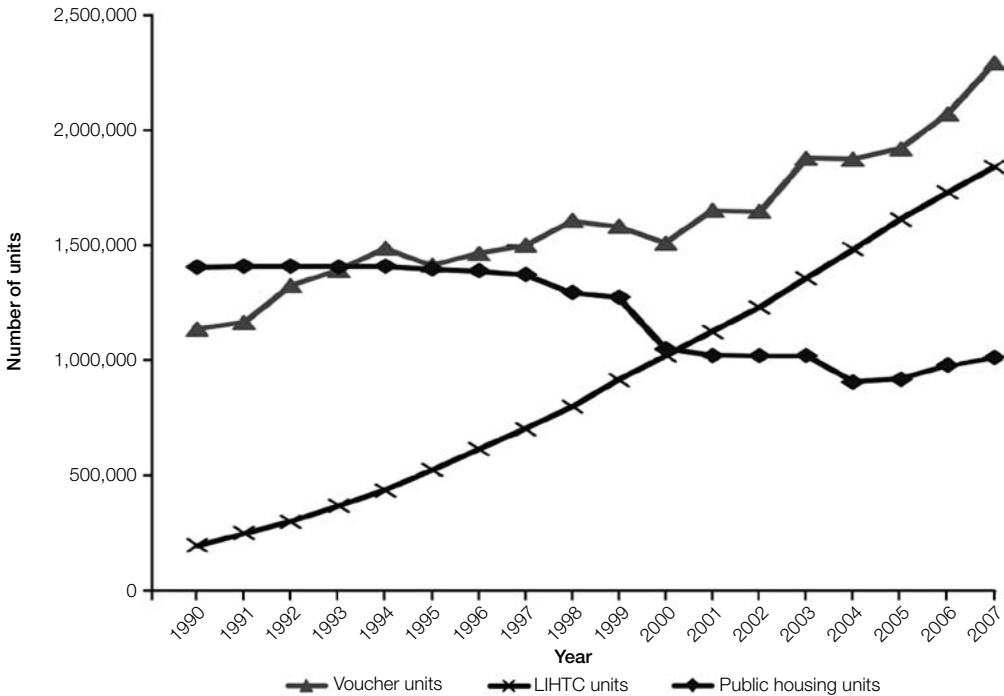
Background and Literature

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 households. 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, including the suburbs. Rubinowitz and Rosenbaum (2000) reported a number of statistics highlighting exactly how dangerous Gautreaux participants' and other Chicago public housing residents' neighborhoods 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. Relocates 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 relocates reported big problems from people using and selling drugs, and the shares of relocates reporting big problems with shooting, attacks, and rapes and sexual

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 neighborhood³ 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

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 counts⁵ 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.

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

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—

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

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

⁷ $0.5 * \sum_{i=1}^n \frac{v_i}{V} - \frac{nv}{NV}$. 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*** (0.158)	0.311** (0.130)	0.403*** (0.148)	0.312** (0.142)
Average rent in lower crime neighborhood as percent of FMR	0.305** (0.124)	-0.0553 (0.142)	-0.121 (0.142)	-0.00324 (0.150)
Percent renters in high-crime tracts	0.560 (0.390)	0.536 (0.432)	0.799** (0.373)	0.924** (0.398)
Vacancy rate in low-crime tracts	-1.140 (0.694)	-0.406 (0.609)	-0.185 (0.732)	0.224 (0.742)
Crime concentration			0.542* (0.288)	0.527* (0.293)
Voucher dissimilarity index			0.947 (0.705)	0.525 (0.753)
Voucher and crime interaction term			-0.928 (0.668)	-0.891 (0.666)
Poverty rate		-1.782*** (0.517)	-1.986*** (0.709)	-2.832*** (0.880)
Percent African American (voucher holders) minus percent African American (city)			-0.0722 (0.205)	-0.290 (0.192)
Percent Hispanic (voucher holders) minus percent Hispanic (city)			-0.223 (0.224)	-0.478* (0.254)
Poor dissimilarity index		0.603* (0.357)		0.876* (0.515)
White/non-White dissimilarity index		0.191 (0.166)		0.414 (0.266)
SOI law dummy			-0.0106 (0.0477)	-0.0109 (0.0507)
Central city dummy			0.0753 (0.0512)	0.0481 (0.0492)
Constant	0.961*** (0.112)	1.315*** (0.254)	1.099** (0.456)	0.902** (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

The author thanks the U.S. Department of Housing and Urban Development for generous dissertation research funding and thanks Ingrid Gould Ellen, Katherine O'Regan, Johanna Lacoë, and Vinit Mukhija for helpful comments. All errors are those of the author.

Author

Michael C. Lens is an assistant professor in the Department of Urban Planning at the University of California, Los Angeles, Luskin School of Public Affairs.

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Commentary: Community Policing and Public Housing Authorities

Matthew C. Scheider

U.S. Department of Justice

The opinions expressed in this article are those of the author and do not represent the official position or policies of the Office of Community Oriented Policing Services or the U.S. Department of Justice.

During the 1960s, rising public concern about crime, inner-city race riots, and fractured police and community relations spurred a new interest in policing and housing policy. Since then, public housing and municipal policing have been the subjects of much research and significant change. As the articles in this symposium make clear, these two fields are intimately entwined, and it is likely that they have much to learn from one another. This commentary specifically addresses the community policing philosophy (hereafter, community policing) and its possible application to public housing; however, opportunities certainly exist, which are not discussed here, for municipal police to likewise adopt lessons from the public housing arena.

Community policing has attempted to transform the way police departments fundamentally approach their work. This transformation has encouraged new ways for the police to understand and respond to public safety issues. Before this movement, officers had become increasingly confined to their vehicles and isolated from the community, and numerous empirical studies questioned police effectiveness (Greenwood, Chaiken, and Petersilia, 1977; Kelling et al., 1974). Community policing came about as a result of a desire to improve on the traditional policing model that emphasized preventive patrol, rapid response, arrests, and investigations. Community policing asked agencies to move beyond this reactive state by emphasizing two fundamental aspects of public safety: (1) the police can rarely solve long-term, serious public safety problems alone, and (2) the fundamental unit of police business should be “problems” rather than merely a response to crimes as discrete sets of “incidents.” Community policing asks agencies to incorporate these fundamental principles of partnerships and problem solving into their organizational structures. These principles should serve as the basis for everything an agency does, from the personnel they hire, to how they evaluate personnel and organizational performance, to the way their management structures operate. Community policing can be defined as—

... a philosophy that promotes organizational strategies, which support the systematic use of partnerships and problem-solving techniques, to proactively address the immediate conditions that give rise of public safety issues, such as crime, social disorder and fear of crime. (COPS Office, 2012: 1)¹

This philosophy, when fully implemented, provides policing agencies with new ways to examine and respond to complex public safety issues, and many of these lessons could be translated to how public housing authorities (PHAs) approach their work. Note that, according to the 2008 Census of Local Law Enforcement Agencies, the United States had 13 public housing police departments with 250 sworn personnel (Reaves, 2011). These agencies could offer great insights into the relationship between community policing and public housing, which could significantly contribute to this discussion. Community policing can provide a lens through which to examine how PHAs, police, and the communities they serve can join together to most effectively ensure that public housing and voucher programs contribute to, rather than detract from, public safety efforts.

Partnerships are critical to effective responses to important public policy issues.² All the articles in this symposium emphasize, in one way or another, the critical role that partnerships play in addressing public housing and public safety. Collaborative and structured partnerships that tap into the resources that various stakeholders bring to bear are vital for long-term sustained efforts to improve public well-being. Jocelyn Fontaine's article emphasizes the role that functioning partnerships between correctional agencies and community-based service providers play in facilitating the successful reintegration of offenders into stable households (Fontaine, 2013). Community policing emphasizes that the police can and should also play a part in the reintegration process, and successful model programs have demonstrated just such partnerships (LaVigne et al., 2006). Similarly, Christopher Hayes, Graham McDonald, Susan Popkin, Leah Hendey, and Allison Stolte bring attention to the need for improved partnerships with service providers to support relocated households to break any possible association with higher crime rates (Hayes et al., 2013). The articles by David P. Varady, Xinhao Wang, Dugan Murphy, and Andrew Stahlke and by Michael C. Lens discuss the critical role that landlords play in successfully implementing voucher programs so that these households do not become overly concentrated in high-crime and high-poverty areas (Lens 2013; Varady et al., 2013). Effective communication with landlords to combat negative perceptions of voucher holders can open up new housing opportunities and help in their transition. Similarly, police officers vary significantly in their level of understanding of the needs of subsidized housing residents and voucher holders, and including officers in coordinated efforts to understand and address these issues is critical. The article by Ann Owens points out how residents' perceptions of disorder and safety play a central role when assisted housing residents move into new areas (Owens, 2013). The importance of transparency and communication with citizens to address these perceptual issues before they exacerbate actual public safety and disorder problems is a central tenet of community policing.

¹ For a more detailed articulation of the philosophy and how it relates to other innovations in policing, see Scheider, Chapman, and Schapiro (2009).

² For a discussion of how community policing can translate to community governance and city management, see Diamond and Weiss (2009).

In addition to emphasizing partnerships with other government agencies, nonprofit service providers, and community members, community policing emphasizes the need for partnerships with private businesses and the media. Private businesses have a great stake in the health of the community and can be key partners that bring considerable resources to addressing public housing and public safety issues (Chamard, 2006). Businesses can help identify problems and provide resources for responses, including access to their security technology and community-outreach capabilities. Local chambers of commerce and visitors' centers can help disseminate information about housing programs and crime prevention practices. The media can also significantly affect public perceptions of public housing and fear of crime. They are a powerful mechanism by which to communicate with the community regarding these issues. They can help publicize public housing information and can be an avenue to address community concerns and possible solutions.

Community policing encourages police departments to engage in proactive problem-solving efforts in a systematic and routine fashion. Problem solving is an analytic approach to identifying problems, collecting and analyzing information about them, developing and implementing innovative responses to them, and evaluating those responses to determine their effectiveness (Goldstein, 1990). These problem-solving principles may have much to offer those responsible for effectively administering public housing programs. This approach would recommend the careful identification and prioritization of the issues surrounding specific housing programs and approaching them as problems rather than as discrete, unrelated incidents. Perhaps the central issue in a particular community is the reintegration of returning offenders, as Fontaine (2013) discusses, or in another community it could be addressing the cultural differences between suburban residents and incoming voucher holders from the inner city, as profiled by Varady et al. (2013). The primary problem for another public housing program could be drug and alcohol violations, as discussed by Marah A. Curtis, Sarah Garlington, and Lisa S. Schottenfeld (2013). Just as police departments confront varying crime and public safety problems, the specific mix of issues facing each PHA is likely unique. Therefore, the routine and systematic identification and analysis of these issues should be a central part of how a housing authority operates. They should have mechanisms in place to identify, prioritize, and understand their most pressing problems.

After these problems are identified and better understood, the problem-solving process would then encourage PHAs to implement broad and uninhibited responses in collaboration with relevant stakeholders.³ As Curtis, Garlington, and Schottenfeld (2013) highlight, these responses may include a reexamination of restrictions on access to housing assistance programs or the broader engagement of landlords and citizens, as other authors in this symposium advocate. PHAs should be encouraged to reach out to diverse stakeholders (including the police) to help develop solutions to the public safety issues that affect voucher holders and communities with high concentrations of residents who are on public assistance. Finally, PHAs should then measure and evaluate the effectiveness of these responses so that they can contribute to improved program design and implementation.

³ For more detail about the problem-solving process, see Goldstein (1990), Schmerler (2002), <http://www.popcenter.org>, and <http://www.cops.usdoj.gov>.

Community policing asks law enforcement agencies to transform their organizational management, structure, personnel, and information systems to institutionalize these partnerships and problem-solving principles. Public housing authorities may want to examine the benefits of employing these types of changes to their own management and administrative structures. Are they organized in such a way as to encourage effective partnerships with other entities to address ongoing problems in the properties and among the residents for whom they are responsible? Could improved mechanisms be put in place to modify and enhance their analytical capacity when it comes to understanding and addressing long-term recurring problems? Could public housing authorities modify their performance-evaluation mechanisms for their employees and their organizations to emphasize the needs to address and respond to problems and to partner with relevant stakeholders?

Community policing has become a central organizing principle for policing agencies across the United States, and its influence on police operations is unmistakable. Much has been written and learned about the implementation of community policing during the past four decades, and PHAs may want to consider adopting some of these innovations in their work. Police, in turn, likely have much to learn from the work of PHAs, given the intimate relationship between housing issues and crime. Cross-pollination between public housing and public safety agencies will surely result in improved effectiveness for both.

Acknowledgments

The author thanks Deborah Spence for reviewing an earlier version of this article.

Author

Matthew C. Scheider is the Assistant Director of the Research and Development Division at the U.S. Department of Justice, Office of Community Oriented Policing Services.

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Commentary: Crime As a Dimension of Neighborhood Quality

Jill Khadduri
Abt Associates Inc.

The overall theme of the very interesting and important articles in this symposium is rental housing assistance and crime, but the articles fall into two discreet topic areas: (1) crime as a dimension of the neighborhood quality of assisted housing and (2) the potential of assisted housing to help families or individuals with criminal background histories stabilize their lives. I will focus on the first topic and comment briefly on the second.

Exposure to crime is one main reason housing policymakers should be concerned about the neighborhood quality of assisted residents. When asked about the reasons they prefer some locations to others, families most often talk about wanting a safe neighborhood for their children (Mills et al., 2006). The exposure of children to crime was also a catalyst for the redevelopment of distressed public housing.¹

The public perception that poor families moving into a neighborhood bring crime with them is an equally important reason for concern about the relationship between the location of assisted housing and crime. That widely held perception is one of the political weaknesses of the voucher program and, in my view, the primary reason that the growth of the voucher program did not continue after the program reached a certain size. Political support for the program eroded among politicians who formerly supported the voucher approach because of its emphasis on the private market and its cost-effectiveness. Articles in this symposium point to the substantial growth in the size of the voucher program between the mid-1980s and 2009, but they fail to put the 2.1 million current vouchers in the context of the need for more units of assistance. The Bipartisan Housing Commission has recommended expanding the voucher program to serve the approximately 3.5 million unassisted renters with extremely low incomes who need the program and would use it (Bipartisan Policy Center, 2013; Buron, Kaul, and Khadduri, 2013). Even if current federal budget problems ease, that expansion is likely to come about only if negative perceptions of the voucher program ease as well.

¹ Alex Koltowitz's *There Are No Children Here* (1991), which described the exposure of children to violent crime in Chicago public housing, profoundly changed the political dynamic and made it possible to start tearing down some of the worst public housing developments.

In the public mind, housing vouchers unfortunately became closely associated with the relocation of families from the most notorious public housing projects (Rosin, 2008). This perception is a weakness even of the academic literature on the voucher program, which focuses to an excessive degree on families who relocate from the most distressed public housing projects. The Moving to Opportunity and HOPE VI relocation studies are excellent bodies of research, but they helped create a perception that the voucher program is all about public housing relocation. Ellen, Lens, and O'Regan (2012), cited by several of the articles in this symposium, is a notable exception and found that the voucher population overall does not bring crime to neighborhoods. The article by Christopher Hayes, Graham McDonald, Susan Popkin, Leah Hendey, and Allison Stolte and the article by Ann Owens contribute further by showing that, even for public housing families relocated with vouchers, the evidence on increases in crime rates in the receiving neighborhoods is ambiguous rather than conclusive (Hayes et al., 2013; Owens, 2013).

On the other hand, what the articles in this symposium show about the neighborhood quality of the voucher program is a cause for major concern and policy intervention. The articles by Michael C. Lens and by David P. Varady, Xinhao Wang, Dugan Murphy, and Andrew Stahlke look from the perspective of neighborhood crime, rather than using neighborhood poverty as a proxy for multiple dimensions of quality (Lens, 2013; Varady et al., 2013). These articles show that families using vouchers tend to locate in declining neighborhoods, where housing is getting cheaper, where owners of rental housing do not have a robust market for their units, and where the voucher program appears to provide a business opportunity for investors by offering them above-market rents for the housing units they acquire. Furthermore, vouchers are concentrating in particular buildings within these neighborhoods and communities. Varady et al. (2013) show that this concentration results, in part, from the interaction of the Low-Income Housing Tax Credit (LIHTC) Program and the voucher program. LIHTC owners are prohibited by law from rejecting a prospective tenant who proposes to use a voucher to pay the rent, and public housing authorities (PHAs) may identify LIHTC properties as convenient places to send families shopping for housing to rent with their vouchers.

This pattern of voucher use in declining neighborhoods, including weakening inner suburbs, is unfortunate, both because voucher families are not avoiding neighborhoods in which they are exposed to crime and because the pattern exacerbates the stigma attached to vouchers. Vouchers are seen as the cause rather than the result of neighborhood decline. Schoolmates identify children from voucher families as “project kids” because many such children come from the same apartment building.

Fortunately, many policy levers and administrative practices can help counteract the pattern of voucher families concentrating in declining neighborhoods.

- One of the most important policy levers is for the PHAs that administer the voucher program to enforce the program's rent reasonableness test when determining the rent they will pay an owner. A statement by a PHA official, quoted by Varady et al. (2013), about the ability of landlords to get higher rents from the voucher program is an example of the very common weakness of not paying enough attention to the location of the housing when determining its market-comparable rent.
- PHAs should broaden the information on where rental housing is available beyond lists of owners who are particularly interested in having voucher tenants. The practice described by Varady et al. (2013) is a positive example of such PHA practice.

- PHAs should refuse to sign housing assistance payment contracts in crime “hotspots.” I recently interviewed a voucher program director in a high-poverty northeastern community who does exactly that. She is a notable exception to the nearly universal PHA practice of ignoring neighborhood quality when applying the voucher program’s housing quality standards.
- Lens (2013) proposes paying closer attention to the location of LIHTC developments, and I agree. The state agencies that administer the LIHTC program should strengthen selection policies that discourage locating (or preserving) multifamily rental developments in locations where rental housing is already inexpensive. The Qualified Allocation Plans (QAPs) that guide the location of LIHTC housing include market studies that focus on whether property proposed for subsidy will have occupancy problems. They do not focus enough, however, on whether the LIHTC property would weaken an otherwise vulnerable neighborhood by concentrating voucher households there. This area may be one in which the federal legislation that creates the framework for QAPs should be changed (Khadduri, 2013).

Articles in this symposium recommend other practices that can combat the perception that voucher families are poor tenants and bad neighbors.

- The close coordination with the police department to identify households that should lose their vouchers, as described in Varady et al. (2013), is an example of such good practice.
- Varady et al. (2013) recommend that PHAs treat landlords and neighborhood associations as partners and make efforts to solve real or perceived problems, even when doing so goes beyond their narrow responsibility for enforcing program rules. This idea is an old recommendation (see Churchill, Holin, Khadduri, and Turnham [2001], a study by Abt Associates, Inc., cited in Varady et al. [2013]) and remains an important one.

In a world in which the number of individuals and families who need housing assistance exceeds the number who can receive subsidies, policymakers are interested in using housing assistance to do more than make housing affordable. Attention focuses on “special needs” populations, including people who experience homelessness, people with disabilities, people with fragile health, and families involved with the child welfare system. In recent years, most of the growth of the voucher program (other than its use to replace public housing and privately owned assisted projects) has been through special allocations of vouchers for special needs populations, most recently homeless veterans.

Marah A. Curtis, Sarah Garlington, and Lisa S. Schottenfeld find a broad range of PHA policies on screening out households with criminal histories and also some discretionary application of those policies within the PHA (Curtis, Garlington, and Schottenfeld, 2013). In a study for the U.S. Department of Housing and Urban Development of how PHAs attempt to serve people who experience homelessness, Dunton et al. (forthcoming) find that PHAs are most willing to alter their policies on screening out households with criminal backgrounds when they are working in a partnership with service organizations that will take responsibility for solving any problems that might occur in the family’s or individual’s use of the housing.

Jocelyn Fontaine’s article shows that housing with services for reentering prisoners can be effective in reducing recidivism (Fontaine, 2013). The article, unfortunately, does not go very far in

describing the services and differentiating the service models between those applied when the housing is in a single property and those applied when the program's clients are scattered. Therefore, the article does not contribute much to the lively debate about the pros and cons of project basing versus complete integration of vulnerable populations into mainstream community housing.

Acknowledgments

The author thanks her colleague Larry Buron for a thoughtful review of this commentary.

Author

Jill Khadduri is a principal associate and senior fellow at Abt Associates Inc.

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Commentary: Considerations for Improving the Quality of Life for Voucher Recipients

Mark A. Stallo

Dallas Police Department

The six articles included in this *Cityscape* symposium address a wide range of issues related to public housing and crime. These articles present very interesting and important issues that need to be considered when developing a public policy toward the safety of all neighborhood residents, including public housing tenants. This commentary addresses some of the insights gained from my 34 years of law enforcement experience and a great deal of study related to various types of public housing. The findings from each article lend a new perspective toward possibly improving the quality of life for public housing and voucher recipients. The authors cover issues such as criminal records, mental health, neighborhood integration, and education. They remind the reader that no quick fix exists with regard to integrating government housing populations into the various neighborhoods that have developed throughout the United States. I highlight important passages from each article to emphasize the most salient points about public housing issues related to crime, and, when relevant, I provide examples from my experience with the Dallas Police Department (DPD).

In their article, Marah A. Curtis, Sarah Garlington, and Lisa S. Schottenfeld make it clear in the following statement that change is needed and that the policies should be made clear and consistent.

Policymakers may need to consider structural changes to the federal alcohol, drug, and criminal history restrictions and limitations to PHA [*public housing authority*] discretion in favor of clear, equitable policy standards that are transparent and consistent across the housing assistance programs. (Curtis, Garlington, and Schottenfeld, 2013: 49)

Although a more liberal policy shift may help first-time offenders obtain public housing, strict rules should be put in place to monitor these individuals and protect those tenants who follow the rules and are well integrated into society. Many potential policies would affect tenant freedom, but they would necessarily increase the security of the residents. One example is a restriction in the lease on the time tenants and visitors can linger in the common areas. When these restrictions were placed in high-crime areas in Dallas, crime was reduced because the opportunity for conflicts and fights to occur late at night was less. This enforcement works well in all types of multifamily housing. Another policy that I have seen protect residents is an early criminal record check to determine if the resident has committed other crimes. Another issue that I repeatedly observed was offenders who were not on the lease living with a tenant for an extended period of time.

These individuals need to be removed from the property through criminal trespass laws. Overall, landlords are responsible for the well-being of all tenants living in the complex, and landlords working with various public housing authorities (PHAs) to implement policies can create a safe environment in which to live while giving ex-offenders an opportunity to restart their lives.

In her article, Jocelyn Fontaine demonstrates, with the Returning Home—Ohio (RHO) experiment, that programs to help individuals coming out of prison can be successful but may need to be customized for mentally ill people and drug abusers.

Finally, although the overall program was effective, this study does show that some participant characteristics were significantly related to recidivism. Specifically, the finding that those with a substance abuse (mental health) or personality disorder diagnosis had worse outcomes than those without these diagnoses may reveal something about RHO or about individuals with these characteristics. (Fontaine, 2013: 71)

Proper support for these individuals is necessary to help them to become productive citizens once again, and housing is a critical component. PHAs must be prepared to deal with these types of tenants and formulate plans to reintegrate them into the neighborhood. If these populations are ignored, citizens living in their neighborhoods will suffer the consequences—these tenants will end up somewhere and leave some community vulnerable. Throughout my career, I have seen individuals who have received counseling and support become successful in society. This approach seems to work much better than enforcement.

Christopher Hayes, Graham MacDonald, Susan Popkin, Leah Hendey, and Allison Stolte point out in their article that special services are important in helping neighborhoods absorb voucher households and in integrating them into the neighborhood to prevent crime.

These findings support the conclusions of our earlier study, further emphasize the need for greater services and supports for relocated households, and can help inform policy directed at breaking the association between these households and neighborhood crime rates. (Hayes et al., 2013: 9)

These services could range from additional security to onsite counseling. Both types of services are expensive and could reduce the number of dollars available to provide housing for those who need it. Each action will have a reaction in the budget for each PHA. One method for monitoring criminal activity in public housing is to determine who has been arrested and who has given an address in a public housing development. Many of these individuals are not on the lease, and this information can be provided for the management at the PHA to take appropriate action. This approach was used in the past between the DPD and the Dallas Housing Authority (DHA). It is quite necessary, however, to provide housing to these individuals and to introduce programs so that they do not affect other tenants.

In his article, Michael C. Lens discusses the difficulty of finding good quality housing in a safe neighborhood.

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. (Lens, 2013: 131)

This statement is quite true and can be explained by cost. It is a difficult decision for PHAs to pay more money to place tenants into good neighborhoods, because the PHA could locate more voucher recipients into housing units in lower cost neighborhoods. But such lower cost units, in general, are in neighborhoods with higher crime rates. Therefore, it becomes a policy balancing decision between placing more recipients in cheaper units or placing fewer recipients into higher rent properties with less crime. In Dallas, the DHA built expensive housing in a wealthy neighborhood in North Dallas and spent approximately \$500,000 for each unit. The purpose of this building was to create integration in this neighborhood. If the DHA had placed voucher recipients into cheaper housing, however, it would have been able to provide many more units for needy individuals. Educating and empowering recipients in cheaper units to help them gain the means of improving their neighborhoods through reduced crime may go a long way in producing the same effects desired in more stable neighborhoods. Programs such as crime watch, working more closely with the local police departments, can improve the safety of neighborhoods. The DPD works hard in developing these groups through social media, meetings, and so on. The Department targets all neighborhoods and socioeconomic groups.¹

Ann Owens shows in her article the need to diversify housing throughout a city. In neighborhoods where rent is cheap, PHAs can afford to provide more vouchers, but those neighborhoods unfortunately are often on the decline. Therefore, it is counterintuitive to locate voucher holders in higher priced neighborhoods. Nevertheless, placing voucher holders throughout both high- and low-crime neighborhoods will help spread out the voucher programs and enable poor households receiving the voucher to be more likely to live cohesively with the middle class.

Boston residents perceived their neighborhoods to be less safe if more voucher users lived there, perhaps because voucher users tend to move to higher crime areas. Overall, the transformation of assisted housing appears to shape residents' perceptions of neighborhood disorder, violence, and safety in positive or neutral ways. (Owens, 2013: 77)

When residents are faced with living on the street or being provided with housing in a bad neighborhood, they will choose the bad neighborhood. High concentrations of voucher holders in a neighborhood unfortunately create pockets of poverty similar to public housing developments. Therefore, the end result is several concentrated neighborhoods throughout a city rather than concentrated public housing. Both types of neighborhoods have similar demographics and problems. The solution is to issue vouchers in disparate areas to thin the concentration. It is necessary, however, to educate voucher recipients on the benefits of moving into this type of neighborhood although their friends choose not to move. Another approach is to tear down substandard housing and to move the residents to a different section of town. Thinning out the bad housing provides a neighborhood with a better chance to grow.

¹ A list of DPD programs is available for review at <http://dallaspolice.net/community/community.html>.

David P. Varady, Xinhao Wang, Dugan Murphy, and Andrew Stahlke reveal the potential value of PHAs holding participating Housing Choice Voucher Program (HCVP) landlords accountable for local code violations by treating them as clients, just as they do the voucher recipients (Varady et al., 2013). The PHAs should point out “the importance of educational outreach and public relations, which would include stressing the authority’s strict screening policies against drug use and criminality” (Varady et al., 2013: 127). The authors also point out that PHAs can work with school districts and other youth agencies to help meet the needs of children living in HCVP units. Each recommendation is common sense and quite important if the PHAs are going to help to change the direction of the voucher program. In Dallas, a community engagement program targets substandard areas of town and brings the schools, churches, community leaders, and philanthropic groups together to improve the neighborhood.

Overall, these articles demonstrate a need for more flexible and creative policies in moving public housing forward as a foundation to improve public safety for all public housing tenants. As important, addressing the stigma associated with vouchers and other public housing programs is imperative. One possible solution is examining the threshold for the number of vouchers within an apartment complex to prevent their concentration. In Dallas, many apartments that became overloaded with voucher holders led to flight by those who could afford to move elsewhere. This dynamic merely perpetuated deepening problems in the neighborhoods after all the middle-class residents left. If the middle class leaves, the goal of poor residents learning from the middle class is diminished and the stigma will persist.

Finally, PHAs should invest in research to evaluate the effect and effectiveness of programs that aim to improve the quality of life of residents within various neighborhoods. Understanding what actually works is the foundation for the success of any special service or targeted policy. This research should help PHAs think about refining their policies to improve existing and future housing programs, particularly in helping improve public safety in the neighborhoods in which they are located. PHAs, however, still must determine which programs need to be introduced by neighborhoods to improve the quality of life while mitigating the cost of a unit for individuals who receive housing.

Acknowledgments

The author thanks Ron Wilson from the U.S. Department of Housing and Urban Development for the opportunity to provide this commentary. The purpose of the Caruth Police Institute, where the author is assigned by the Dallas Police Department as a liaison, is to broaden the views of how law enforcement in Dallas addresses issues within society and can better serve the citizens.

Author

Mark A. Stallo is a lieutenant of police in the Dallas Police Department and a liaison at the Caruth Police Institute.

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Point of Contention: A Denser Future?

For this issue's Point of Contention, we asked scholars with substantial knowledge of the topic to argue for or against the following proposition—"In 40 years, the average person will live closer to her neighbors and farther from the ground than she does today."

Changes in Urban Population Densities Over the Next 40 Years

Nathaniel Baum-Snow
Brown University

Although the many forces at play will push both for and against increases in residential densities, the current institutional and market environments in the United States and the world, examined in the context of empirical evidence on reasons for urbanization and changes in urban form, point most likely toward increased urban densities in the years to come. In making my case that higher population densities are most likely, I discuss in turn the most important mechanisms that are likely to shape human land use patterns in the coming years. I first consider forces that influence city structure for existing city residents and firms, taking employment locations and urban infrastructure as given. I then consider infrastructure, local amenities, and forces that influence firm location choices. In closing, I consider the urbanization process and the influence of a rising world population.

Rising wage income increases both the value of commuting time and the demand for space. As is discussed in Glaeser, Kahn, and Rappaport (2008), rising wages cause urban densities to increase only if the income elasticity of demand for space is sufficiently low. Consensus empirical estimates indicate that this elasticity is this low. Since the early 1980s, we have seen rapid wage increases for many with incomes above the 50th percentile of the wage distribution and, consequently, an increasing fraction of the population with very high values of commuting time. As shown in Baum-Snow and Pavan (forthcoming), these changes in the wage structure have been especially pronounced in larger cities. This phenomenon helps explain the remarkable amount of gentrification and residential population growth we have seen in almost all U.S. cities' downtowns since 2000. Even struggling cities like Detroit and Cleveland have experienced an influx of high-income residents in search of short commutes into their downtowns.

Increases in women's labor force participation rates since the early 1970s and declines in fertility rates have reinforced increases in demand for the most densely developed space. As women have entered the labor force, a greater fraction of the population values commuting time, which provides an incentive for more people to live closer to work. Children do not commute very far, and

thus contribute essentially zero to a household's value of commuting time. Children do contribute to households' demand for space, however. The decline in the U.S. fertility rate from its peak of 0.122 births per woman of childbearing age in 1967 to only 0.065 births per woman today has markedly reduced each household's demand for space and the associated demand for suburban living.

One of the most important changes to urban areas worldwide has been the construction of high-speed, limited-access highways. As demonstrated in Baum-Snow (2010, 2007), these highways promoted an enormous amount of urban residential and employment decentralization between 1950 and 2000 in U.S. cities. Urban highway construction has almost completely ceased in U.S. cities, however, with similar construction trends in most other industrialized nations. Several cities have even torn down highways. Therefore, this mechanism for reduced urban densities is a thing of the past in most countries, although China is a notable exception (Baum-Snow et al., 2012). Instead, cities in industrialized countries continue to invest robustly in public transportation systems, which encourage high residential density (Baum-Snow and Kahn, 2005). Moreover, higher gasoline prices, which are not expected to recede, have encouraged less driving and shorter commutes (Molloy and Shan, forthcoming).

An additional force that has precipitated decentralization in many U.S. urban areas is the declining consumer amenity value of cities. Baum-Snow and Lutz (2011) provide evidence that declines in school quality for many public school students have led to decentralization of White families in particular. Cullen and Levitt (1999) provide evidence that rising crime rates have led to urban decentralization. Albouy (2012), however, provides evidence that urban quality of life has recently rebounded: public school quality has at least stabilized, crime rates have declined and remained at historic lows, and the central city decay of the 1960s and 1970s has begun to reverse. Given these recent experiences, it appears unlikely (although still possible) that city amenities will decline sufficiently in the near future to again reduce demand for urban living.

In the past century, employment densities declined along with residential densities. Some of this decline is explained by transportation and telecommunications infrastructure expansions, which are now largely complete. Some of the decline results from the close structural links between residential and employment locations. It may also be the case that the cross-firm productivity and cost spillovers that led firms to agglomerate have become less important with expansions in infrastructure. For certain skill intensive industries, however, Rosenthal and Strange (2003) and Arzaghi and Henderson (2008) provide evidence that agglomeration spillovers remain strong, or are strengthening, and are much stronger over very small distances between firms. Face-to-face interactions are becoming an increasingly important part of worker productivity (Baum-Snow and Pavan, 2012). Because downtown office configurations and density make interpersonal interactions relatively inexpensive, the composition of central-city employment has shifted from being concentrated predominantly in blue-collar jobs to white-collar jobs. Many large city downtown areas have experienced office construction booms, drawing high-income office workers to live nearby. In the future, growing industries, which require skilled workers, will only promote denser urban development.

To this point, I have discussed density mostly in the context of the United States. But each of the ideas developed in the previous discussion also holds for most other countries the world. Developing countries in particular have a few additional relevant forces that will also promote denser living.

Rapid urbanization has been occurring in many developing countries. While a detailed discussion of reasons for such urban-rural migration is well beyond the scope of this article, they include capital deepening in agriculture, improved urban infrastructure, and globalization's promotion of demand expansions for urban productive activities. In addition, population growth rates in many developing countries continue to be very high. With more than 50 percent of the population in many developing countries now living in urban areas, some of this new population has to be accommodated higher off the ground and in more cramped conditions.

This article lays out the myriad reasons for which urban population densities are expected to grow during the coming 40 years. Although such density growth brings challenges, it also brings opportunities. Cities and dense economic activity are engines of innovation and growth and typically generate lower environmental costs than low-density living. We should be hopeful about the bright prospects that denser living brings, although simultaneously be aware of the burdens that density growth can impose.

Author

Nathaniel Baum-Snow is an associate professor of economics and urban studies at Brown University.

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The Transportation Transformation of Our Cities Will Be More Important Than Density Changes

Marlon G. Boarnet

University of Southern California

This article addresses the following point of contention: “In 40 years, the average person will live closer to her neighbors and farther from the ground than she does today.”

In 40 years, U.S. metropolitan areas will be less dense *and* less automobile oriented. The transportation transformation of our cities, already well under way, will be more important to future urban policy than any measure of average metropolitan density.

Population density in Manhattan peaked in 1910 and, as of 2010, had dropped by nearly one-half (Angel, 2012; Saywack, n.d.; U.S. Census Bureau, n.d.a). During the same timespan, the percentage of Americans living in census-defined urban areas increased from 46 to 81 percent (U.S. Census Bureau, n.d.b). So, one forecast would juxtapose those two facts—central city densities are declining and the world is becoming more urbanized—and would ask how those two forces will balance out. That balancing, however, would miss a key point.

Approximately every two generations, we rebuild the transportation infrastructure in our cities in ways that shape the vitality of neighborhoods; the settlement patterns in our cities and countryside; and our economy, society, and culture. The Eisenhower Interstate Highway System, initiated in 1956, was the last such great transformation. We are well into a new wave of transportation transformation. Los Angeles is building six new rail transit lines, and, after those are complete, the world’s prototypical automobile city will have a metrorail system longer than today’s Washington Metro rail system (Boarnet, 2013). The best available data indicate that walking, as a percentage of all trips, increased in the United States from 2001 to 2009 (Pucher et al., 2009) and, during that same time period, walking mode share went up in 9 of the 10 largest U.S. metropolitan areas (Boarnet, 2013). In many of those 10 largest metropolitan areas, one-fifth of all trips are on foot. Driving, measured either by trips per driver or miles per driver, peaked sometime in the late 1990s in this country (Boarnet, 2013). Why the change? Two trends are important.

First, gasoline is becoming more expensive. In 2002, a gallon of gasoline cost, in inflation-adjusted terms, about the same as it cost in 1978, but, since 2002, the inflation-adjusted cost of gasoline has

increased by nearly 60 percent (data are from the U.S. Energy Information Administration, as cited in Boarnet, 2013). As China and India develop, increasing the global demand for oil, that trend is likely to continue.

Second, and more important, the time cost of urban travel has also increased. The Texas Transportation Institute (Shrank et al., 2011) reports that highway delay hours in the largest metropolitan areas more than doubled from 1982 to 2010—that despite a drop in delay hours coincident with the 2008 recession. Urban highways are becoming expensive at precisely the same time that our primary transportation funding instrument, the fuel tax, generates declining revenues on a per-mile-traveled basis (Taylor, 1995, 2000). U.S. Department of Transportation data show that, nationwide, from 1980 to 2009 urban highway and arterial miles increased 73 percent, and urban-vehicle miles traveled on those roads increased 136 percent. We cannot build highways fast enough to keep up with increases in travel, not only because of Downs' (1962) well-known conjecture that more unpriced (or nontolled) roads will induce more travel (Duranton and Turner, 2011), but also because urban highways are becoming more expensive while our highway funds are shrinking relative to miles driven. The likelihood of more strict environmental regulations, including efforts to reduce greenhouse gas emissions, will add pressure that favors infill development in ways that will increase street and highway traffic congestion.

We have come to expect that new technologies will dramatically lower transportation costs (the driverless car seems the most recent of these ideas), but our urban areas are becoming more congested, if not more densely populated, and transportation innovations and available policies are not likely to change that trend toward more congested urban travel. The implications will be twofold.

First, absent some great new “one size fits all” transportation innovation, cities will be left to make progress incrementally, as finances and politics allow. Bicycle lanes and bike-sharing programs, car sharing, and pedestrian-friendly streetscapes are all becoming common elements of the urban transportation landscape. Instead of one massive national infrastructure project (such as the Interstate Highway System), the transportation project of the next several decades will be incremental and varied. The second implication is a corollary of the first. I call it the “return of the local” in urban transportation. What makes sense in one neighborhood will not necessarily make sense in another neighborhood. Some locales will lobby for real-time parking pricing, and other places will experiment with neighborhood vehicles, while still other areas might implement ambitious bike-sharing programs, or congestion pricing, or rapid-transit systems. The fabric of urban land use and transportation will be substantially more varied in two generations than it is today.

Will we live closer to our neighbors and farther from the ground in two generations? Some people will and some will not, and our metropolitan areas will grow larger, become more economically important, and have higher density in some places even as overall densities continue to fall. Yet that likely change in urban density patterns obscures the dramatic transformation that is already occurring. The private car is no longer the only organizing theme for urban transportation. The variation in infrastructure, the implications for neighborhood transitions, the diversity of associated land use types, and the need for new governance and financing tools all will create a more complicated but potentially more vibrant urban world. Developing policies, plans, financing tools, and governing structures that can knit together these newly empowered neighborhoods into a regional structure will be the policy challenge of the next 20 years, and whether we live on the 1st or 40th floor will be less important than adapting our cities to this new transportation reality.

Author

Marlon G. Boarnet is a professor and the Director of Graduate Programs in Urban Planning and Development in the Sol Price School of Public Policy at the University of Southern California.

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High Optimism

Jill Stoner

University of California, Berkeley

This article addresses the following point of contention: “In 40 years, the average person will live closer to her neighbors and farther from the ground than she does today.”

Who is the *average* person? What is *closeness*? Where is *the ground*?

These questions are not rhetorical; they address the multiple paradoxes of our contemporary cities. Demographics of *majority* and *average* in the United States continue to evolve, challenging the paradigm of middle-class America that has been in place since the mid-20th century. The idea of *proximity* has been compromised and radically altered through social media; and the very notion of *ground* is a concept made precarious by advances in vertical agriculture, sky gardens, and elevated transit.

We are variously engaged in the political, the social, and the ecological; thus the response to the above provocation is tempered by tints in our own metaphorical glasses. At the time of this writing, I had recently moved from a relatively old 3rd-floor walk-up in an intimate San Francisco neighborhood to the 17th floor of a relatively new apartment building in Oakland. My “garden” is one elevator stop down on the 16th floor, complete with lawn, picnic tables, and thermal bath. My closest neighbor sleeps with her head only a wall-thickness away from mine, an intimate distance by any standard, although we have not yet met and I do not know her name. In many ways, I have taken the ground with me, but there are also aspects of terra firma that I am happy to leave behind.

Conventional wisdom often claims that urban dwellers, particularly those in highrise buildings, eschew closeness and choose this residential typology for the anonymity it offers. The stereotype of averted eyes in elevators persists, alongside the reluctance to knock on doors to borrow the proverbial cup of milk. Neighborliness is most often associated with sidewalks and porches, and all the other attendant arguments that have made the “new urbanism” model take hold across the country and, more recently, across the world. Densities and heights that are only possible by elevator ascent can carry with them the promise of an idealized privacy, or even a taint of aggressive territoriality.

The latter is the premise of J.G. Ballard’s novel, *High Rise*, a modern dystopian narrative of architecture’s power to provoke conflict, alienation, and violence. Set in Ballard’s own time near the end of the 20th century, the novel features an architect who finances and designs five identical 40-story towers in London’s Docklands district. The first completed tower, which is the setting of the story, literally embodies a socioeconomic hierarchy. Lower floors are separated from middle ones by a public level, including a supermarket and swimming pool. The top floors are serviced by their own

exclusive executive elevators. Stewardesses, teachers, and secretaries live near the ground level; above them are the minor executives and doctors. The architect, whose name is Royal, lives in rarefied and isolated luxury in the penthouse on the 40th floor.

The novel opens with this line:

As he sat on his balcony eating the dog, Dr. Robert Laing reflected on the unusual events that had taken place within this huge apartment building during the previous 3 months (Ballard, 1975: 1).

This scene is the endgame in a narrative of social disintegration that parallels the physical disintegration of the building itself. Architect and architecture support and subvert each other, reflecting a coded hierarchy of class divisions that eventually (in its stubborn resistance to any fluidity) causes the building and its architect to self-destruct. (The sacrificial dog being consumed by Laing in that opening scene is Royal's Alsatian.) Utilities break down, elevators become garbage dumps, and stairwells are taken over and become sites of mortal combat. The residents wall themselves apart from each other, using furniture to barricade their apartment doors from the inside. In this story, closeness becomes the very engine of aggression, and those who live farthest from the ground are the most willful aggressors. The "Royal" architect has designed a building that arouses primitive survival instincts in its residents; at one point, he leads a hunting party through the interior wilderness. He finally makes his last stand against another tenant (significantly named Wilder) on the penthouse roof. A highly stratified and seemingly ossified architecture has engendered a complete de-evolution, a spatial drama in which tactics of self-preservation unfold on a vertical battlefield.

Ballard's novel is a narrative and negative caricature of a visionary, utopian urbanism that began with French-Swiss architect Le Corbusier's design for the Radiant City (*Ville Radieuse*) in 1924. For Le Corbusier and other architects of the *Congrès Internationaux d'Architecture Moderne*, tall towers surrounded by green space held the promise of social equality, and even of universal happiness. After World War II, the architectural concept of the highrise, further fueled by advances in steel construction, crossed the Atlantic to engage two distinct American agendas. In cities across the United States, corporations embraced the skyscraper as the very symbol of their identities, while federal policies in the 1950s and 1960s tested the concept of the Radiant City in large developments of subsidized housing. It was not long before this latter experiment was deemed a disaster; the sanctioned demolition of the 33 Pruitt Igoe towers in St. Louis became a universal symbol of visionary good intentions gone awry. More recently, in newly built cities of Asia and the Middle East, skyscraper housing has become the norm. As we approach the century mark of Le Corbusier's radiant vision, digital technologies are producing new building configurations, and environmental technologies are contributing layers of living walls, sky gardens, and energy generation to ever more radical forms of vertical architecture.

I am an incurable optimist, yet I have no utopian answers for our urban future. Instead, I imagine a continuing saga of resilience to pursue, abandon, reinvent, and resurrect forms of social and ecological relationships, most fundamentally expressed in our forms of dwelling. We currently face a fork in this proverbial road—leading in the opposing directions suggested by this Point of Contention series of articles. Those who will advocate for more distance between dwellings and more connection to the ground are perhaps guided by the desire for continuities between past

and future and an understandable affection for the traditions of townships, neighborhoods, and gardens planted in terra firma behind firmly owned houses. Those of us who argue for encouraging new architectural experiments in height and density, on the other hand, have no ideal images from history in which to plant our vision. Yet to assume a return to the familiar certainties of walkable neighborhoods and corner stores as our only possible future is to suggest that the future can never be different from the past—that, in fact, we are finished with urban inventions and urban dreams.

Several years ago, The History Channel sponsored a competition, inviting eight architects to imagine the city of San Francisco 100 years in the future. My team and I offered a narrative vision of tall *strands* of city, winding along the routes of obsolete roads and freeways, which themselves have been given over to wildlife and agriculture. The strands take the urban ground up with them, supporting an infrastructure of commercial boulevards 20 stories in the air and a density of population that stands in contrast to the wilderness below it. This vision was the result of collaboration among architects, essayists, urbanists, wildlife biologists, and civil engineers who argued for a new kind of city—one open to the contingencies of nature and the imaginings of writers and artists.

We deliberately kept that visual future vague—to emphasize that a time 100 years in the future is certainly ours to imagine—but it is not ours to design, or even to plan. Now, as I look out from my 17th-floor windows, I can squint into a time 40 years ahead, look through the Bay Area fog to beyond those well-worn nostalgias for the front porch and the back garden. Although my apartment faces east, the setting sun is reflected in the façade of another tall building on the adjacent block. Here, even east and west become close, ambiguously joined through accidents of an architecture that was designed to keep nature’s mysteries at bay.

So perhaps our task in looking ahead is to begin to forge policies that will allow us to experience the unexpected and the ephemeral. Such policies may emerge through local voices both in argument and with consensus. To argue for living farther from those macadam streets below requires a leap of faith and an agreement to forego clear pictures in favor of blurry speculations.

Acknowledgments

The discussion of Ballard’s novel *High Rise* appears in a different form in the author’s book *Toward a Minor Architecture* (Stoner, 2012).

Author

Jill Stoner is a professor of architecture at the University of California, Berkeley.

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Population Density: Some Facts and Some Predictions

Stephen Malpezzi

Wisconsin School of Business

This article addresses the following point of contention: “In 40 years, the average person will live closer to her neighbors and farther from the ground than she does today.”

When thinking about the typical American regarding density and building height, I predict—no way, and probably not. When thinking about people globally, I predict—no, and no.

How strong are my prior beliefs? Of the four predictions, on a scale of 1 to 10, where 1 is winning a lottery jackpot and 10 is the sun rising tomorrow, my subjective confidence on each of them, in turn, is United States: 9, 6; global: 7, 8.

In this article I explain why I am more confident about my density predictions than my predictions about building height in the United States, although the reverse is true for my global predictions.

Population Density: Some Basic Facts

Much of the discussion in this article is about cities and urbanization. The simplest definition of *urbanization* is the existence of above-average density. Densities vary across countries and within them. Divided evenly, every person in the world could have about 2 hectares of land.¹ The United States has an above-average endowment of raw land, by world standards: about 3.1 hectares per person (or about 0.3 people per hectare [pph]). Some other countries, however, have even larger areas relative to their population: Canada has about 30 hectares of raw land per person, Australia has 40 per person, and Russia has 12 per person. At the other extreme of the density scale, examples of higher densities include China, which has only 0.75 hectare per person (or about 1.35 pph); India and Japan have about 3.5 pph; Korea and the Netherlands have about 4.75 pph; Bangladesh has about 10 pph; the city states Singapore and Hong Kong have about 65 pph.

The figures presented in the previous paragraph, however, are extremely crude; densities vary even more *within* countries than *across* countries. Within the United States, most of the population lives within a few hundred miles of the major coasts (including the Great Lakes); with a few exceptions, such as Denver and Salt Lake City, most of the country is fairly empty between Minneapolis and the area 100 miles or so from the Pacific Ocean (Rappaport and Sachs, 2003). This pattern is not

¹ A hectare is 10,000 square meters, or 1/100 of a square kilometer. About 2.47 acres comprise a hectare.

atypical; many countries have some fairly dense areas and some (often large) “empty quarters.” For example, almost 90 percent of Canada’s population lives within 200 miles of the U.S. border, most of China’s population lives within 100 miles of the coast, and very few Australians live very far from the coast.

The average densities of U.S. states ranges from about 4 pph in New Jersey (denser than India or Japan), 3 pph in Rhode Island (denser than Germany), and more than 2 pph in Connecticut and Massachusetts to less than 0.05 pph in Nevada and New Mexico and less than 0.02 pph in Alaska. To give some idea of the state density differences, if the entire United States, excluding Alaska, were settled at New Jersey’s density, the country would contain more than 3 billion people.

Density Within Cities

So far, this article first examined data regarding density and now examines population as it relates to cities. The U.S. Census Bureau defines *urbanized* as census tracts and blocks that meet certain population density thresholds and that are part of or connected to some urban core of 2,500 or more people. During the past 40 years, the total U.S. population has grown about 1.1 percent per year, the urban population has grown about 1.3 percent per year, and the rural population has grown slightly more than 0.2 percent per year. Thus, the United States has been becoming more urban. In total, about 81 percent of the U.S. population is currently urbanized compared with 74 percent 40 years ago.² Over the very long run, the fraction of the U.S. population that is urbanized follows a logistic curve, sort of a stretched-out S, which is bounded between 0 and 100 percent. Given the recent slowing of the upward shift, it will be surprising if the overall U.S. rate of urbanization goes up more than a few percentage points over a 40-year time horizon.

Turning from the population of cities, the article now examines land as it relates to cities. U.S. Department of Agriculture (USDA) land use data show that urban areas comprise only about 3 percent of the U.S. land mass; another 2 percent is built-up rural areas, including highways (Nickerson et al., 2011).³ Between 1969 and 2007 (USDA’s closest available years to our benchmarks for population in the preceding paragraph), U.S. urban land grew from about 13 million hectares to 25 million hectares; at 1.6 percent growth per year, urban land grew 0.3 percent per year faster than urban population. That difference is more meaningful than it might first appear, given the effects of compounding over 40 years. On the other hand, urban population growth and urban land growth have

² The first census was undertaken shortly after the ratification of the U.S. Constitution in 1790. The definition of “urban” has changed, unsurprisingly, from time to time; the most recent significant changes were in 2000. We have made no adjustments for these changes to census data. Some U.S. data we will mention in the following section are based on metropolitan areas, rather than urbanized areas. Metropolitan areas are collections of counties containing one or more principal cities, but they can contain some nonurbanized area. The distinction between metropolitan and urban can be very important for many purposes, but it does not matter much for the discussion in this article, which focuses on urban, except as otherwise noted.

³ Independent research by Shlomo Angel and associates using a different methodology (satellite imagery and statistical modeling) estimated a U.S. urbanized land share of 1.2 percent, which is less than one-half of the estimate from USDA’s broader definition of urban (Angel et al., 2012). Overall, Angel et al. (2012) estimated the world’s cities cover about 0.5 percent of the world’s total land area, but, of course, large deserts, mountain ranges, and practically unusable places like Antarctica exist; Angel et al. (2012) estimated that cities cover about 4 percent of the world’s *arable* land area. Angel et al.’s (2012) methodology estimated that 6.3 percent of arable U.S. land is urbanized.

been broadly slowing down in the United States. Between the end of World War II (WWII) and 1970, urban population grew at an annual rate of 2.7 percent and urban land grew at an annual rate of about 3.0 percent, or roughly double the more recent rate.

Next this article examines population and land together, relying on USDA's estimates of urbanized land. When considering only urbanized land and urbanized population, the average U.S. urban density is about 10 pph. This density is about 30 times the simple national average we calculated in the previous section. The density is calculated for urban and rural populations combined; compared with the simple average for the United State's densest state, the national *urban* average of 10 pph is more than double the *simple* average for New Jersey's urban and rural areas.

Although country averages are often cited and are of some interest, densities across and within cities vary remarkably, whether in U.S. cities or in cities around the world. Bertaud and Malpezzi (2013) recently updated their research on urban density in 54 cities around the world, including 8 major U.S. cities,[†] using a consistent methodology. They measured the average density of built-up census tracts, or their local equivalent, in each place; then they examined that pattern of these measures using several second-stage measures. (For a more detailed description of their method, see Bertaud and Malpezzi, 2013.) Exhibit 1 presents their overall average population density for the built-up areas of these cities. Exhibits 2 through 5 go beyond the overall city averages and present some simple density patterns within the cities of New York, Paris, Moscow, and Johannesburg. These exhibits present the average density of built-up areas in each 1-kilometer ring from the central business district (CBD).

Exhibit 1

Average Population Density of Selected World Cities (1 of 2)

City	Country	Year of Data	Average Number of People per Hectare in the Built-Up Area of the City
Mumbai	India	1991	389
Hong Kong	Hong Kong	1990	367
Guangzhou	China	1990	365
Seoul Municipality	Korea, Republic of	1990	322
Shanghai	China	1990	286
Seoul and New Towns	Korea, Republic of	1990	282
Tianjin	China	1988	228
Hyderabad	India	1991	223
Kabul	Afghanistan	2005	215
Hanoi	Vietnam	2009	209
Bangalore	India	1991	207
Moscow	Russia	1990	182
Addis Ababa	Ethiopia	2002	177
Barcelona	Spain	1990	171

[†] This article uses the term "city" in its generic sense; the units of observation, in general, are close to the U.S. definition of a metropolitan area. See Bertaud and Malpezzi (2013) for details. Many detailed country case studies are available at <http://alainbertaud.com/>.

Exhibit 1**Average Population Density of Selected World Cities (2 of 2)**

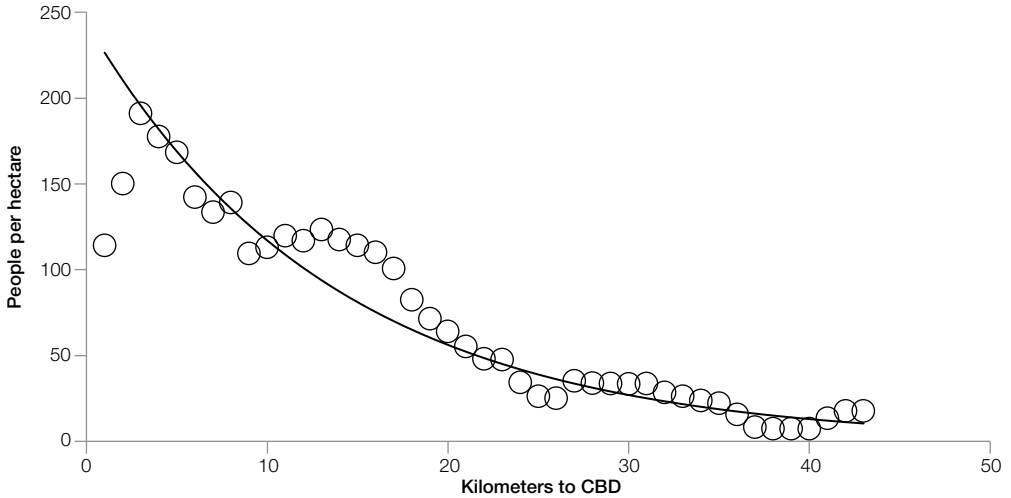
City	Country	Year of Data	Average Number of People per Hectare in the Built-Up Area of the City
Tianjin	China	2000	170
Yerivan	Armenia	1990	168
Ho Chi Minh City	Vietnam	2009	150
Tehran	Iran	1996	146
Beijing	China	1990	145
Abidjan	Cote d'Ivoire	1990	143
Ahmedabad	India	1991	134
Jakarta	Indonesia	1990	127
St. Petersburg	Russia	1990	121
Singapore	Singapore	1990	107
Tunis	Tunisia	1990	102
Rio de Janeiro	Brazil	1991	101
Mexico City	Mexico	2000	96
Sofia	Bulgaria	1999	94
Paris	France	1990	88
Danang	Vietnam	2009	88
New York City MSA	United States	1990	80
Prague	Czech Republic	1990	71
Warsaw	Poland	1993	70
Buenos Aires	Argentina	2000	66
Krakow	Poland	1988	65
Riga	Latvia	2000	64
Budapest	Hungary	1990	63
London	United Kingdom	1990	62
Bangkok	Thailand	1990	58
Brasilia	Brazil	1991	55
Curitiba	Brazil	1991	54
Marseille	France	1990	53
Johannesburg	South Africa	1991	53
Ljubjana	Slovenia	1990	46
New York CMSA	United States	1990	40
Toulouse	France	1990	36
Berlin	Germany	1990	36
Stockholm	Sweden	2000	36
Capetown	South Africa	1990	32
Los Angeles	United States	1990	22
Washington, DC	United States	1990	21
San Francisco MSA	United States	1990	19
Chicago	United States	1990	16
San Francisco Bay CMSA	United States	1990	16
Portland	United States	2000	14
Houston	United States	1990	11
Atlanta	United States	1990	6

CMSA = consolidated metropolitan statistical area. MSA = metropolitan statistical area.

Source: Bertaud and Malpezzi (2013)

Exhibit 2

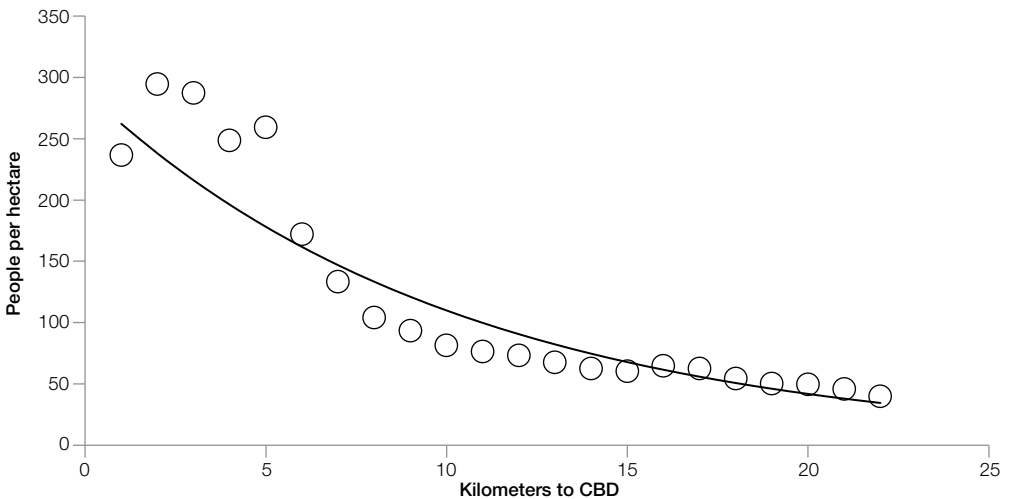
New York City MSA, 1990



CBD = central business district. MSA = metropolitan statistical area.

Exhibit 3

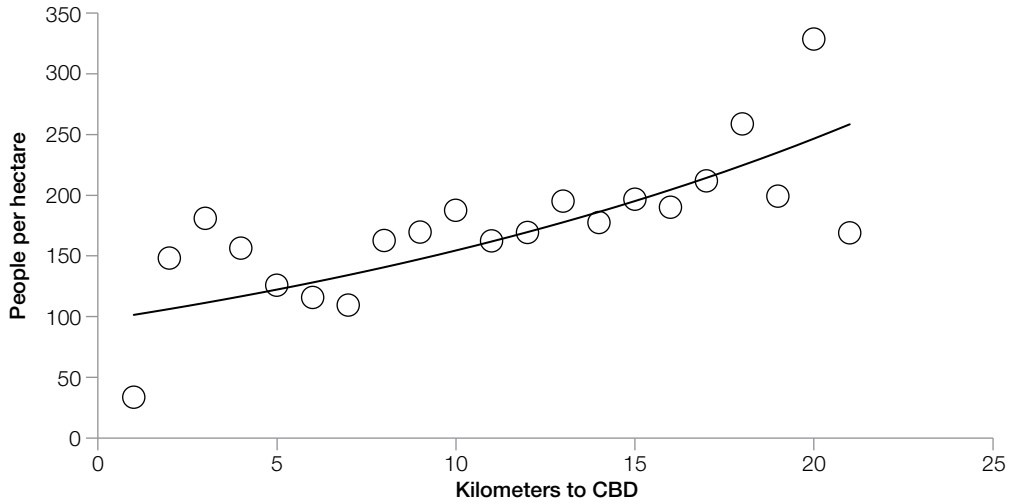
Paris, 1990



CBD = central business district.

Exhibit 4

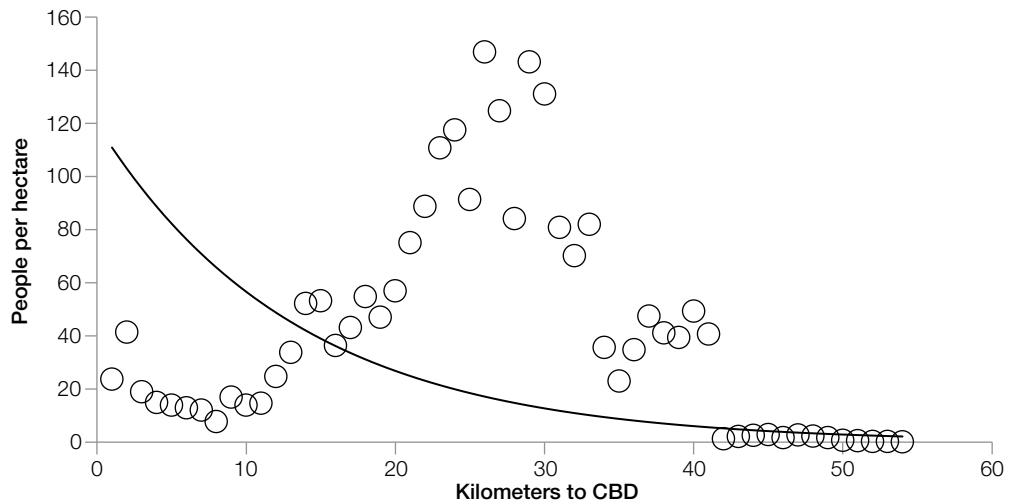
Moscow, 1990



CBD = central business district.

Exhibit 5

Johannesburg, 1990



CBD = central business district.

Enormous variation in the average density of cities is immediately apparent in exhibit 1; these population densities range from 6 pph in Atlanta to 389 pph in Mumbai. According to these averages, the densest cities in our sample are mainly in Asia, but Africa has some fairly dense cities (Addis Ababa and Abidjan), and Europe has a few very dense cities in our sample (Barcelona and Moscow). Moscow is a particularly unusual and instructive case, as Bertaud and Renaud (1997) have carefully documented, and we note briefly in the following section.

The eight U.S. cities examined in Bertaud and Malpezzi (2013) and in this article—New York; Chicago; Los Angeles; Washington, DC; San Francisco; Houston; Portland; and Atlanta—are at or near the bottom of our global comparisons of average density. Among large cities in the United States, New York is the densest, with an average density of 50 pph and a central density approaching 200 pph, falling off rapidly to 50 pph or fewer about 20 kilometers from midtown Manhattan. Chicago and Los Angeles have central densities of 50 to 70 pph and average densities of around 20 pph; Chicago's central density is higher, but Los Angeles' average density, 22 pph, is greater than Chicago's 16 pph. At the other extreme, Atlanta's central density is only 25 pph, although it exhibits an even faster dropoff with distance from the center, from a lower base, and an average density of 6 pph.

What Can Urban Economics Teach About Density?

Urban economists have developed and tested a family of models, deriving from the closely related models of Alonso (1964), Mills (1972), and Muth (1969), which we will refer to simply as the AMM model.⁵ The AMM model demonstrates that this pattern of a high central population density followed by a rapid initial dropoff that slows as we move out from the center of the city is a consequence of qualitatively similar patterns, first in land rents, and then in real estate rents and asset prices. These land rents, in turn, are derived from the value of access to a central location; in particular, the increase in value of a location a kilometer closer to the center of the city depends on savings in transportation cost. In the higher land value locations, developers and landlords have incentives to apply more capital (structures) to a unit of land, leading density to roughly correlate with these land values.⁶ Simple, but broadly defensible, versions of the AMM model characterize the dropoff in land rents, and therefore in population density, as a “negative exponential” function; that is, measured density follows the form—

$$D(\mu) = D_0 e^{-\mu/\epsilon}$$

⁵ In addition to consulting the original works of Alonso (1964), Muth (1969), and Mills (1972), see Turnbull (1995), McMillen (2004), and Glaeser and Kahn (2004) for elaboration and variations on the simplest models.

⁶ Construction costs do not vary much by location within a city and are usually assumed to not vary at all in the models (Davis and Palumbo, 2008). Land rents and corresponding asset prices vary a lot, both in reality and in the models. Real estate developers combine land and structure to obtain houses and other real estate, so real estate rents and asset prices vary more than the structures but vary less than the land. Further, if technology and regulations permit the production of different kinds of housing (single family, duplexes, multifamily, all of varying sizes), developers will build most densely where land costs the most; in the simpler models, this land is located at or near the city center. The population density data observed directly and discussed in this article correlate with the development of more or less dense housing. The models formalize this perfectly intuitive process. See Follain, Renaud, and Lim (1979) for representative empirical evidence on the relationship between land rents and density patterns.

where D is population density at distance u from the center of a city, usually called the central business district (CBD) by urban economists; D_0 is the density at the center; e is the base of natural logarithms; γ is “the gradient,” or the rate at which density falls from the center.

Thus, urban economists concern themselves with more than just the average density of a city. Malpezzi and Guo (2001) and Galster et al. (2001), for example, discussed a wide variety of measures. For most urban economists, the second top density measure, after the average, is the aforementioned density gradient. Economists also find it very useful to measure how well the simple model fits the data; that is, to use the simple model as a benchmark. The simple measure of fit used in this paper is the R-squared from the regression equation that estimates the parameters of the simple exponential model written above. To an urban economist, a “sprawling” city, in general, will have some combination of low density, a flat gradient (the city spreads out), and, quite possibly, a poor fit to any version of the standard model.

In the large literature devoted to variants of this model, urban economists also consider taxes, regulations, local governance, fiscal arrangements, other public policies, as well as amenities and natural features of the landscape.⁷ The authors also relax initially strong assumptions about a single center or CBD, and incorporate the effects of infrastructure and physical geography in their analyses. This article defers those for now and focuses on city size, income, and transport costs—the most fundamental determinants of density and urban form across the majority of this rich literature.

Three central predictions of the standard model, for purposes of this article, are (1) cities will decentralize as incomes rise, because richer households will demand more living space, on average, which generally translates into higher demand for land;⁸ (2) cities will decentralize as (if) transport costs fall, because lowering transport costs flattens the tradeoff between a more central location and those farther out; and (3) cities will decentralize (sprawl)⁹ as they grow in population, in no small part because the jobs and other features that attract people to the CBD are in turn decentralized in larger cities. The standard model ironically is often (mis)labeled the monocentric model because it begins with highly centralized employment, dense cores, and steep gradients. Over time, however, fundamental forces revealed by the model cause the city to decentralize, or sprawl. Put melodramatically, the initial monocentric version of the model contains the seeds of its own destruction.

Models Versus Reality

No real-world city mirrors the simple AMM model exactly, but this “negative exponential” density pattern *roughly* corresponds to reality, not only in most U.S. cities, but also in most cities in market-oriented economies, as many studies, including Bertaud and Malpezzi (2013), have documented.

⁷ The works listed in previous footnotes and the references contained in those papers provide an introduction to this rich literature.

⁸ The mapping of increased demand for living space into demand for land is not one for one because of the aforementioned ability to substitute capital (structure) and land to produce houses of different types. Given increased demand for floor space, however, demand for land would increase in the end.

⁹ Many studies emphasize this built-in entropy; see, for example, McMillen (2004) and Wheaton (2004).

A comparison of Paris (exhibit 3) with New York (exhibit 2) shows that, in both cities, the very center of the city is not the densest spot, because the CBD devotes substantial space to office and public uses; it shows, instead, that the densest annuli in the city are a few kilometers out. The exhibits show that density then tends to decrease at a decreasing rate moving out from the center. The estimated density gradients for New York and Paris are -0.07 and -0.10 , respectively. The R-squared values for the two regressions that estimate these gradients are about 0.9 in both cities. In other words, for every 1-kilometer move from the center of New York, density falls about 7 percent; in Paris, the decline is about 10 percent. This very simple descriptive regression captures about 90 percent of the variation in the average density of the two cities' concentric 1-km rings. Within Bertaud and Malpezzi's sample, examples of other cities that very broadly follow this pattern, albeit with steeper or flatter gradients and reasonable but usually somewhat lower R-squared values, include almost all U.S. cities, most western European cities, many (not all) Asian cities, and many Latin American cities (Bertaud and Malpezzi, 2013).

Some cities, however, show very different patterns. The density gradient of Moscow (exhibit 4), for example, goes beyond "flat" and "poor fit": density patterns are actually *inverted* from the standard urban model's prediction, a legacy of a particular central planning system, as discussed in detail by Bertaud and Renaud (1997). The gradient is a positive 0.05, with an R-squared of about 0.44. Johannesburg (exhibit 5) under apartheid shows a less dense central White city, with very dense Black townships some kilometers distant from the CBD. Although the overall estimated gradient, -0.04 , does not look outrageously out of line with other cities, the R-squared is only 0.18, and the equation completely misses the density of the Black townships. In addition to apartheid's other deleterious effects, it created a commuting nightmare for many Black South Africans, whose 2-hour one-way commutes were, and still are, surprisingly common.

Bertaud and Malpezzi (2013) examined other cities, which are more or less similar to standard model predictions, but also point out a number of other anomalies.¹⁰ For example, Curitiba and Brasilia are cities designed by architects and planners with relatively little reference to land-price signals and other market indicators. The cities' density patterns are also very much at odds with the model's predictions; most of their low-income residents live far out from the central core in very dense settlements.

Bertaud and Malpezzi (2013) analyzed these cross-city differences in density patterns more systematically and found, *inter alia*, that cities become less dense and more decentralized as incomes rise and as transport costs fall. Larger cities become more decentralized but also denser on average, *ceteris paribus*, as economists would expect. Although the Bertaud and Malpezzi (2013) study documented these results across countries in a unique way, urban economists are not surprised by these qualitative results, because they have been foreshadowed in the standard models and documented repeatedly in both case studies and comparisons of cities within countries.¹¹ As incomes

¹⁰ Only a few cities are addressed in this article for lack of space; see the full paper and data appendix for figures and detailed data for each city. The data for the four cities discussed in this article are based on 1990 data; the full sample includes data ranging from 1990 to 2009.

¹¹ In addition to consulting papers cited elsewhere in this article, see McDonald (1989), Paulsen (2013), and Jordan, Ross, and Usowski (1998) for good examples of U.S. comparisons.

rise and transport costs fall, households consume more housing. Although the ability to substitute structure for land breaks the one-to-one link between the consumption of housing floor space and the consumption of land, space and land consumption are still positively correlated. As incomes rise and transport costs fall, people consume more land.

The Future of U.S. Cities

What does the AMM model tell us about the point of contention at hand? If incomes continue to rise and transport costs continue to fall, powerful forces will fundamentally continue to decentralize cities and reduce average densities. On the other hand, increasing the size of cities will tend to increase average density, although it will lessen the importance and the density of one or a few central locations in each city.

Despite the well-known recent stagnation in U.S. household income growth, especially for those households with modest incomes, real income growth is expected to resume in due course, although debate continues regarding whether that growth will return to the same patterns of growth and distribution that were present during much of the post-WWII period. Over the long run, rising incomes and the resultant demand for land will cause cities to spread out.

Regarding post-WWII transport costs, there is little trend in the real cost of transportation as measured by the Consumer Price Index (CPI), although these costs rise and fall quite a bit over shorter time horizons, driven partly by the volatility of fuel costs. The transportation CPI, however, leaves out one of the largest costs of commuting and other intracity transport: the cost of time. As incomes rise, the opportunity cost of time also rises, providing at least a partial offset to the demand for housing effect discussed in the preceding paragraph. In addition to these increases in per-hour costs, traffic congestion seems to be increasing in U.S. cities in recent decades. The average one-way commute in metropolitan areas was stable at about 21 or 22 minutes for several decades (the data were first collected in the 1980 census), but that same commute now averages up to 25 minutes, according the American Community Survey.¹² Some trends could push back against these recent increases, including technological innovations (increased telecommuting, “smart cars”) and improved transportation policies (for example, if we adopted congestion pricing of roads and carbon taxes). Although improved transportation policies face serious political roadblocks, improvements in automobiles and road designs are proceeding. Transport costs are likely to increase, on balance, for a while, but it is hard to see that the densifying effects of increases in transportation costs would be so great that they would offset the effects of increasing incomes and demand for housing.

As noted previously, the U.S. population continues to grow at a rate that is a bit less than 1 percent per year. Average metropolitan population growth is just slightly higher than the overall national average. Nonmetropolitan population growth rates are lower than national averages, sometimes substantially so, and are also more volatile year to year. Some tendency exists for the relative popu-

¹² Commutes are actually a modest fraction of urban trips, but the increase in commute time generally will be correlated with congestion. In fact, overall congestion often increases faster than commutes, because one of the “safety valves” in a growing city is the fact that decentralization of jobs can improve commutes (see Gordon, Richardson, and Jun, 1991). As an alternative, one could simply imagine Chicago’s commute if all 4 million metropolitan area workers headed to the Willis Tower each day.

lation growth of the largest metropolitan areas to slow down in recent decades, and, unsurprisingly, much more variation exists in the growth rates of small metropolitan areas than of large areas (Ehrlich and Gyourko 2000). In the end, the population of most metropolitan areas will continue to grow, even in areas such as Cleveland, Detroit, or Harrisburg, where the area's central city populations are declining. Overall population growth will contribute to further sprawl, even if some cities could see increases in average density from this population growth.

Future Patterns of Global Settlements

The outlook for density is similar, if not exactly the same, for cities globally as it is for cities in the United States. Rising incomes are driving demand for increased housing consumption (Malpezzi and Wachter 2012). Long-run average growth rates of gross domestic product per capita are slightly less than 2 percent, which is close to the U.S. average; of course, these averages mask large variations between star performers, like China and Botswana, and countries that have underperformed just as dramatically. The IMF (2013) abstracted from Europe's current stagnation; and Eichengreen, Park, and Shin (2012) expressed concerns about slowdowns in China and elsewhere; and Banerjee and Duflo (2008), Kharas (2010), and Pinkovskiy and Sala-i-Martin (2009) described their expectations for long-run global incomes to continue to rise, extreme poverty to decline, and a much larger global middle class to emerge.

If you consider the minimum floor space consumption worldwide to be represented by 1 square meter of Kolkata pavement, much of the density decrease will signify a wonderful improvement in many lives. We have already seen an extreme case of this improvement in China, where urban floor space per capita *doubled* in less than 20 years.¹³ Furthermore, although big cities like Shanghai have built a large number of tower blocks, the pre-reform housing was so crowded that, on balance, land consumption per capita is probably increasing.

When turning our attention from the United States to the global picture, we need to consider the urban transition that is still under way in many countries, including some of the largest countries. The U.S. population is about 80 percent urbanized; most developed countries and a number of emerging markets are also highly urbanized; Latin America's population as a whole is also about 80 percent urbanized. On the other hand, China's population is about 50 percent urbanized, and India's is about 30 percent urbanized. The populations of many African countries and poorer Asian countries are also around 30 to 50 percent urbanized, which analysis of World Bank World Development Indicators data shows is roughly the point of inflection at which urbanization takes off and begins to increase relatively rapidly until the growth of urbanization slows down again at around 60 to 70 percent.

United Nations (U.N.) population projections suggest that global population growth, already slowing down, will stabilize later in this century.¹⁴ Between overall population growth and increases in

¹³ In 1987, urban residential floor space per capita was 12.7 square meters; by 2005, it was 26.1. See Chow and Niu (2010).

¹⁴ See United Nations (2012) for a more detailed discussion. All such projections obviously are subject to error. The U.N.'s country-by-country analysis uses each country's own definition of urban.

the percentage of people living in the cities of developing countries, however, during the 40-year time horizon of our charge, substantial increases are expected in the number of people living in cities, globally. U.N. population projections roughly suggest an increase of 2.2 billion in cities during the next 40 years, of which 0.5 billion might be in China alone. Although such projections may sound scary (they have given rise to a number of alarmist news items), it is worth noting that in the previous 40 years we added 2.6 billion to the world's cities (340 million in China alone), and that increase was over a much smaller base, with less in the way of resources, knowledge, and infrastructure. I would be the last to minimize the challenges ahead, especially for poorer countries, but we have faced these challenges before, and urbanization presents tremendous opportunities. A huge amount of literature exists on agglomeration and other benefits of urbanization. World Bank (1991) and Henderson (1997) are examples of policy-oriented reviews; Glaeser's (2011) review is a recent and extremely readable introduction to these benefits.¹⁵

What effect does moving from the countryside to the city have on population density? It is hard to put a number on the effect. We have some data on floor space per capita of many international cities, but we have little on the rural areas of many countries. Still, it is surely the case that on first moving from rural areas to cities, density increases. Will this effect be enough to offset the increases in space per urban resident as incomes grow? It is worth noting that often half or more of the growth of developing countries' cities comprises natural increase (number of births divided by number of deaths) of pre-existing residents, with the other half coming from rural-urban migration (and sometimes immigration from other countries). So what we might call the urbanization effect will increase population density, but rising incomes work in the other direction.

Worldwide, a number of forces could cause transportation costs to decline, primarily in developing and emerging markets, as more people shift from slow transport modes (walking, bicycling) to faster modes. How this transformation takes place, and its exact effect on urban form, will be determined in part by public policies including energy pricing. But in the end, both developed and developing countries are expected to see overall declines in density, through this channel, and also after all channels are accounted for. A careful and very rich analysis by Angel et al. (2012) came to the same conclusion. Angel et al. (2012) provided a summary, and they also provided country-by-country forecasts of urban land under alternative scenarios at their website, <http://www.lincolnst.edu/subcenters/atlas-urban-expansion/>.

What Does Density Tell Us About Height?

In addition to asking about density, our charge asked about the population becoming "farther from the ground," or about a building's height. Although much of the press coverage of the U.S. housing market focuses on single-family homes, at the end of World War II about 11 percent of the housing stock was multifamily (5 or more units in a structure); by 1980 the multifamily portion of the

¹⁵ Some of Glaeser's (2011) reported density figures are very different from our own, especially for Chinese cities. This disparity is almost certainly because of the unusual ways that China legally defines cities, which can be more like a city and its surrounding state in other countries. The Bertaud and Malpezzi (2013) method gives a better view of density in the presence of such administrative definitions. None of these differences detract from the main messages of Glaeser's fine review.

housing stock had grown to about 18 percent, and, despite lots of annual volatility in multifamily construction, that is about where it remains today. Within the category of multifamily housing, in recent years we have been building a somewhat larger share of larger (50 or more units) buildings, but, overall, the size distribution of multifamily buildings changes rather slowly. We have been suburbanizing, but the multifamily stock has largely retained its national market share.

Although a correlation exists between building height and population density, this correlation is modest. For example, New York has a number of residential buildings 50 stories or higher; although dense by U.S. standards, New York's central density is only two-thirds the density of central Paris, where heights have been limited to 7 stories.¹⁶ By all accounts, the densest settlement in modern times has been the so-called walled city in Kowloon; at the time of its demolition about 20 years ago, this 2.6-hectare political and urban anomaly reportedly contained an estimated 33,000 people, a density of more than 12,000 pph; the buildings were about 12 stories high (Basler 1992).

As of the writing of this article, the tallest residential building is Dubai's 101-story Princess Tower.¹⁷ It reportedly comprises 763 units on about 0.5 hectares of land. At present we do not have the data that would permit us to analyze Dubai using the same methodology that we use in the analysis of the other cities discussed in this article. Some rough calculations, however, can still be instructive. A reasonable guess is that the Princess Tower building might house 1,500 residents. If the plot is equivalent to a census tract, 3,000 pph would be denser than any other tract in our 54-city sample. If applied, our method would average this pph out over other buildings and intervening land (including roads), yielding a lower estimate than this crude back-of-the-envelope estimate.¹⁸

One back of the envelope deserves another. Compare Princess Tower to another, older, large building—New York's London Terrace. Principal construction was completed in 1928, and it comprises 1,665 units, which probably house 3,000 residents. Its maximum height of 19 stories is about one-fifth the height of the Princess Tower, and London Terrace covers most of a city block, or roughly 2 hectares. This back-of-the-envelope estimate would yield something similar to the densest census tract equivalents in our 54-city sample, or about 1,500 pph. One-fifth of the height of the Princess Tower might, we guess, yield one-half of the density.

Princess Tower and London Terrace are instructive but obviously exceptional. In the end, the United States builds lots of "semi-tall" apartments that are dense by U.S. standards, but not by global standards. U.S. neighborhoods that comprise many 10- to 12-story apartment buildings are often less dense than Parisian neighborhoods with 4-story buildings, much less the denser lowrise neighborhoods of Mumbai or Shanghai.

¹⁶ The outstanding exception (and we mean outstanding in the sense of standing out, not in the sense of excellent) is Tour Montparnasse. This 59-story anomaly in the 15th arrondissement is mainly office space, so it does not directly affect any density calculations. As of this writing, proposals have been written to relax the height restrictions currently in place in central Paris.

¹⁷ Taller office and mixed-use buildings exist; a notable example, also in Dubai, is the 163-story Burj Khalifa building, which happens to have a large number of residential units. To my knowledge, Princess Tower is the tallest primarily residential building currently extant.

¹⁸ Certainly Dubai would be a very welcome addition to the Bertaud and Malpezzi (2013) sample, were the data made available.

In fact, Mumbai provides some of the most compelling evidence of low correlation between building height and density. Mumbai is the densest city in our sample, on average, but it also has some of the most stringent restrictions on building height, as Bertaud (2004) pointed out. Mumbai's Floor Area Ratio (FAR), locally called the Floor Space Index (FSI), is particularly problematic.

FAR regulations directly limit the amount of floor space per unit of land. If the FAR is one, and we have a 1-hectare plot, then we are permitted to build up to a hectare of floor space. If FAR were the only binding regulation, we could theoretically build a one-story structure out to the lot line, or we could build a two-story structure on one-half of the plot, or three stories on one-third of the plot, and so on. Other regulations are usually in place, such as setback requirements, so we rarely see a structure extending out to the lot line all around. (Even in the absence of setback requirements, such a strange building would rarely pass market tests.)

Despite its large population and high overall density, Mumbai has a maximum FAR of, in general, 1.3, even in some of the most central locations. A very few small areas have recently permitted an FAR of 4. For comparison, the maximum FAR in much less dense New York is about 15. Bertaud and Brueckner (2005) undertake a simulation analysis of Bangalore (another city with very low FARs, although not as binding as Mumbai's). Bertaud and Brueckner's (2005) model makes clear that in Bangalore, and surely more so in Mumbai, India's extremely stringent FARs have the effect of depressing development at the center, pushing population out to the periphery. Secondary effects abound; these FARs increase the size of informal (technically illegal) settlements such as Dharavi (made superficially familiar to American viewers of the film *Slumdog Millionaire*) and make bad commutes worse. In terms of our measures, in Mumbai the density gradient is very flat, -0.01, and the R-squared is a paltry 0.19. The problems created by this badly designed FAR are compounded by low incomes, challenging physical geography, other inappropriate regulations on land use and rental markets, and inadequate infrastructure.¹⁹

These few crude examples are only suggestive, but I think they are sufficient to make the point that, although a relationship exists between building height and density, that relationship is not fixed. We have much to learn about the empirics of height and density on any systematic basis, despite some interesting simulation studies, such as Chau et al. (2007). As of the writing of this article, I am not as confident of statements about height as I am about density, because comparatively little research has focused on height per se. More careful research on this subject could be beneficial.

What is my bottom line on whether the average person will live higher up? In the United States, I expect height will decrease along with the general decentralization of population that we will see over the next four decades, even if some individual tall buildings are successfully developed. But I do not have as much data or strong models to stand behind this prior belief. In much of the rest of the world, I expect height to increase somewhat, largely by effects we will probably fail to measure very well: relatively smaller fractions of our world's population will live in rural areas, at whatever density, and a higher fraction in cities. I have not seen too many tower blocks in rural India.

¹⁹ In addition to higher FARs existing on some older grandfathered buildings, developers can build above the legal FAR on some parcels by reducing already low FARs on other parcels; that is, they can implement a form of transferable development rights. Presumably this transfer of rights was the way Mukesh Ambani obtained approvals for his controversial, recently completed, 27-story house in Mumbai, described in Reginato (2012).

Flies in the Ointment?

Famous urban thinker Yogi Berra warned, “It is difficult to make predictions, especially about the future.” Incomes could collapse, transportation costs could skyrocket, and the growth of U.S. urban population could shudder to a halt. Such shocks would clearly sabotage my predictions, but I consider those events unlikely. On the other hand, it is well known that economists are good at working through marginal changes of things in front of them, but occasionally, rather like the dinosaurs, are blissfully unaware of an impending asteroid. What are some of the blue-sky developments that could counter my views?

Some analysts think that cultural and generational shifts are taking place; that some combination of downsizing among the baby boom generation and being environmentally aware among the millennial generation will exhibit radically different preferences for housing and modes of commuting. Nelson (2009) is an interesting example of this view. Although anecdotal conversations with my students over the years suggest less interest in buying a home right out of college than a decade ago, I am skeptical that such changes will be strong enough to drive declines in density. Economists often point to Stigler and Becker (1977), who argued that tastes are more stable than is commonly realized and showed how easy it is to confuse changes in prices and budget constraints with changes in tastes. More recent research by psychologists, without much stake in economists’ desire to reclaim the high ground of unchanging preferences, finds substantial (if not complete) stability in tastes (Kahneman and Snell 1992). My claim is not that underlying preferences cannot change, or will not change at all, but rather that I will be surprised if tastes change enough to drive a reversal in long-run trends in population density over the next several decades.

Many broad technological changes have affected real estate development and density in recent years, and they will continue to do so. The effects of new technology, however, including the Internet, are complex and difficult to sort out completely. The view that telecommuting and other uses will generally lead to a much more spread-out form of development is well represented by Cairncross (2001), but, as others such as Kolko (2000) have pointed out, many new technologies complement urbanization and substitute for it; centripetal and centrifugal forces are at work. It is worth pondering that some of the industries that know and have access to the best telecommuting and other Internet technologies exhibit some of the greatest clustering effects—Silicon Valley and Wall Street immediately come to mind. Many industries do both simultaneously; for example, moving back-office jobs to suburban locations, or even other states or countries, while concentrating on other kinds of jobs.

Both manmade and natural disasters can affect urban form. We noted in the introduction that much of the world’s densest settlements—parts of New York, Florida and the Gulf Coast, the Netherlands, and Bangladesh—may be at risk of sea level changes and future storm surges (Nicholls 2011; Rosenzweig, et al., 2011). Some knowledgeable observers worry about entropy in the control of the world’s thermonuclear devices and other weapons of mass destruction. For most of the history of cities, urbanization has improved personal security, but the 20th century’s military technology has complicated matters. Density may no longer be much of a defense, and the prospect of terrorism may have some effects on density (Blomberg and Sheppard 2007). I have not tried to factor such possibilities of natural and manmade disasters into my simple scenarios, although, taken together, they could have powerful, if uncertain, effects on urban form in the future.

What about public policy? Policies like the mortgage interest deduction have been shown to increase demand for larger homes, albeit with negligible effect on homeownership rates, the oft-cited rationale for these subsidies. On tax policy, see Green and Vandell (1999) and Gyourko and Siani (2003), for example; Brueckner (2001) analyzed a wide variety of public policies and their effects on urban form. Other research, some already mentioned, suggested that sufficiently high energy costs could change household behavior enough to measure (Larson, Lui, and Yezer 2012). Granted, fundamental tax reform that included about a \$50 per ton tax on carbon, reduction in marginal income tax rates, and elimination of the deductions for property taxes and mortgage interest could, over several decades, measurably affect urban form. Such reforms, however, are politically unlikely in the foreseeable future.

Acknowledgments

This article relies heavily on joint work carried out over many years with Alain Bertaud. Solly Angel, Alain Bertaud, Bertrand Renaud, Steve Sheppard, and Tony Yezer provided helpful comments. Errors and omissions are the author's alone.

Author

Stephen Malpezzi is a professor in the James A. Graaskamp Center for Real Estate at the Wisconsin School of Business, University of Wisconsin-Madison.

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The Future of the Affluent American City

Joel Kotkin

Chapman University

Wendell Cox

Demographia

This article addresses the following point of contention: “In 40 years, the average person will live closer to her neighbors and farther from the ground than she does today.”

In 40 years most Americans will likely not live closer to their neighbors and farther from the ground than they do today, at least not materially so. American cities (which are all areas outside rural areas) will continue to disperse, as they did in the decade of the 2000s, when nearly 95 percent of major metropolitan growth was more than 10 miles from downtown areas (Cox, 2012c). Even the share of the Millennial generation (young adults ages 18 to 31) living in lower density areas increased (Kotkin, 2013b) (both contrary to popular lore and refuted by reality).

To be sure, the resurgence of the micro-urban cores, including their population growth, has been encouraging. The actual footprint of occupying disused commercial buildings and abandoned land, however, is small compared with the growth that continues in the suburbs. This micro-urban core growth reflects something rarely considered by urban planners: the vast preference—roughly 80 percent—of most Americans for single-family houses (Beldon, Russonello, and Stewart, 2011). As Pew Research (2009) and others report, suburbanites are surprisingly satisfied with their environment, and considerably more so than urban dwellers. Nor is this preference merely that of older people; both Millennials, particularly as they enter their 30s (Winograd and Hais, 2010), and immigrants (Kotkin, 2012), the two key demographically expanding groups, also seem to prefer suburbs as their long-term residence.

This outward movement, however, is not simply an American trend. As Shmolo Angel (2012) points out in his recently released *A Planet of Cities*, dispersion continues in nearly all global metropolitan areas; with the exception of extremely land-constrained places like Hong Kong and Singapore, virtually all the world’s largest cities are becoming less dense (Cox, 2013a).

This continuing dispersal is being driven by the very reason people moved to cities, the desire for a better life for themselves and their families. This higher standard of living, in turn, is facilitated by the near universality of personal mobility (the automobile) in most of the higher income world. Personal mobility has become so pervasive that no metropolitan planning organization anywhere in the world has seriously proposed a transit system that could largely replace the automobile.

Nearly all the higher income world cities rely principally on the automobile, and citizens in the two or three cities that do not rely on the automobile pay for it in much longer travel times. For example, transit carries most urban travel in Tokyo and Hong Kong, yet travelers in those cities have one-way work trips of more than 45 minutes, more than 1.5 times that of automobile-oriented and much less dense Los Angeles.

The pervasiveness of automobile use may appear to contradict the current theology in urban planning that imagines car drivers can or will be dragooned into transit and walking by increasing urban population densities. In fact, despite rising gas prices and the massive expansion of new rail lines, the percentage of people commuting to work by transit is less than it was 30 years ago. At the same time, the vast majority of urban growth in the country, even since the recession, has been in the more dispersed and least transit-oriented areas (Kotkin, 2013a).

This is not to say that appropriate places for transit-oriented development will not exist, but that transit works primarily in cities where downtowns play an outsized role in the local economy. In terms of transit, proximity to downtown is far more important than density (Ewing and Cervero, 2010). It is not surprising that more than one-half of the transit commuting (Cox, 2013b) in the United States is to only six municipalities (“legacy cities”) with the largest share of downtown employment, including New York, which alone accounts for 35 percent of transit commuting destinations (25 percent in Manhattan alone). By contrast, virtually all other metropolitan areas, from Los Angeles and Miami to Salt Lake City and Indianapolis, have smaller downtowns and much lower transit ridership.

Even in metropolitan areas with legacy cities, however, job locations are so dispersed that less than 10 percent of jobs are accessible (calculated from Tomer et al., 2011) to the average metropolitan area employee in 45 minutes by transit service. The capital and operating subsidies required to materially change this reality are well beyond the capacity of taxpayers. Overall, the average travel time by car to work is about 25 minutes, but, by mass transit, travel time averages 47 minutes.

The densification agenda for urban planning has been around for decades, but it has been re-energized by the concern about greenhouse gas (GHG) emissions. Yet, data in national studies indicate that nearly all the anticipated reduction in GHG emissions (Cox, 2012b) to 2050 will be the result of fuel-efficiency improvements. More restrictive land use regulation, such as densification, spends far more per ton of greenhouse gas removed than necessary and leads to less economic growth, less household affluence, and more poverty, as economic research has indicated (see, for example, Jansen and Mills, 2013).

The densification agenda also has other negative consequences. Virtually all economic research (see, for example, Cheshire, 2009; Green and Malpezzi, 2003) demonstrates that policies such as urban growth boundaries lead to higher housing costs (just as tighter Organization of the Petroleum Exporting Countries, or OPEC, quotas lead to higher gasoline prices). As densities increase, so do traffic congestion and travel times, which impede economic growth. As a result, the densification agenda leads to less household affluence and greater poverty. Metropolitan economies perform better (Prud'homme and Lee, 1999) when greater mobility exists (more jobs can be reached in a particular period, such as 30 minutes).

The Portland, Oregon metropolitan area may be a good indicator of the future. Portland has had the most radical regional densification policies in the nation. The area has developed one of the nation's largest light-rail systems and restricts development to within an urban growth boundary. Some densification has taken place, but not enough to make much of a difference. Portland remains a medium-density urban area. If Portland were to continue to densify at its 2000-to-2010 rate, it would take another 125 years before Portland's density would reach the density Los Angeles has today.

Working at home (which requires no densification and no public funding) has increased substantially in Portland—and in most major American metropolitan areas—and now exceeds transit (both light rail and bus) in most American regions. At the same time, the car has increased its share of travel relative to the so-called sustainable modes of transit—walking and cycling—since before the first light-rail line was opened. Now the financial situation of transit in Portland is so dire that 70-percent service cuts have been threatened, largely because of the transit agency's failure to control labor costs (Rose, 2013). Does the average Portlander live closer to her neighbors or farther from the ground than she did 33 years ago? Not to any material degree. Yet, the median house price has skyrocketed relative to incomes.

We do not suggest that future suburban development will replicate the planning-induced and artificially low densities of urban areas such as Atlanta and Boston but suggest instead that densities will remain in a range that accommodates both automobiles and consumer preference. Indeed, the continuing expansion of information technology could lead more people to leave the urban area completely, which would lead to even lower densities.

U.S. cities are the richest in the world—36 of the 50 most affluent metropolitan areas in the world are in the United States, according to data in the Brookings Institution *GlobalMetro Monitor* (Istrate and Nadeau, 2012). They also have the some of the most affordable housing in the world (Cox and Pavletich, 2013). U.S. traffic congestion is less intense, largely because of the lower population densities and more dispersed employment patterns of American cities. Finally, American workers have shorter work trip travel times than workers in Europe, Canada, Australia, or high-income Asia (Cox, 2012a). The success of American cities in shorter commute times and more affordable housing is at least partially attributed to their lower densities.

Given this success and the vast weight of preferences, it appears highly unlikely—short of draconian planning restrictions or decades-long recession—that the American city will ever see revival of the high urban densities experienced in the 19th and early 20th centuries. Density may retain and even expand its presence in places, but the future of the American city seems more likely to remain largely dispersed in the decades ahead.

Authors

Joel Kotkin is the R.C. Hobbs Fellow in Urban Studies at Chapman University.

Wendell Cox is principal of Demographia, a St. Louis-based public policy consultancy.

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Which Metropolitan Areas Work Best for Poverty Deconcentration With Housing Choice Vouchers?

Kirk McClure
University of Kansas

Abstract

The Housing Choice Voucher Program (HCVP) offers choice to poor renter households, but only a fraction of the households in the program use that choice to locate in low-poverty neighborhoods. Analysis of metropolitan areas across the United States finds that the typical metropolitan area locates 19 percent of its HCVP households in census tracts where less than 10 percent of the population is impoverished. This rate is less than the share of units with rents low enough for the program found in these low-poverty tracts. Race and ethnicity matter. Non-Hispanic White HCVP households are able to enter low-poverty neighborhoods at a rate greater than the availability of affordable units, whereas minorities are not. The metropolitan areas differ markedly in the percentage of HCVP households who locate in low-poverty tracts. Greater entry into low-poverty tracts is found in soft markets and markets with a high percentage of total tracts that are low-poverty tracts. The level of the Fair Market Rents (FMRs), which govern the HCVP, also proves to influence the level of voucher entry into low-poverty neighborhoods, suggesting that gains could be realized by localized changes to the FMRs.

Introduction

The Housing Choice Voucher Program (HCVP) is the nation's largest rental housing assistance program. It helps 2.2 million households and more than 5 million people (HUD, 2012). This program is characterized in its subsidy delivery by the choice given to the participating household. With project-based subsidy programs, the household enjoys reduced housing costs, but the choice is

constrained. The household must reside where the assisted housing is located to gain the benefits. The HCVP permits the household to locate any place the household can find a unit that will pass physical inspection and is offered at rents that are within the program limits.

The program works well (Turner, 2003). It generates high levels of satisfaction among its participating households, especially among those households that use HCVP to move to neighborhoods with low crime rates and improved access to services (Briggs and Turner, 2006; Comey, Briggs, and Weismann, 2008; Varady and Walker, 2003). Very low-income households given vouchers are less likely to suffer from a high housing cost burden and are more likely to live in quality housing than their poor counterparts (HUD, 2000). By far most voucher households pay 30 percent of their incomes on housing. About one in six households pays more than 40 percent of its income on housing, and although doing so is not permitted in the program's rules, the problem appears to be because of short-term fluctuations in income rather than an inability of the program to accommodate variations in the marketplace (McClure, 2005).

The program is understood to have both income and substitution effects (Jacob and Ludwig, 2008; Shroder, 2002). The voucher augments income, but the increased income, coming in the form of a voucher, is not fungible; it must be used for housing. This restriction generates some distortion in the recipient household's consumption decisions. The voucher also influences employment decisions. In the HCVP, the rent is set at 30 percent of income, which means that any increase in income through additional employment will generate an automatic increase in rent, discouraging additional employment. Researchers disagree on the magnitude of this substitution effect, with opinions ranging from effectively nil to as much as a 4-percent reduction in labor force participation.

The program is relatively efficient. Nearly all the federal tax expenditure goes into the consumption of housing. The public housing authorities (PHAs) that administer the program do so on a shoestring budget (Henriquez, 2013). The program serves the poorest of the poor; the typical HCVP household has an income placing it at 22 percent of the Area Median Family Income (McClure, 2005). The program makes the consumption of good-quality housing affordable for these participating households.

Among the program's successes is that it helps some households locate in low-poverty census tracts, although the number of such households is fewer than we might expect given the availability of units (McClure, 2008). Two aspects of this movement to low-poverty tracts remain unknown: What explains the variation among metropolitan areas in the percentage of HCVP households entering into low-poverty tracts? What does this variation imply for expanding the use of vouchers in a poverty-deconcentration effort? The U.S. Department of Housing and Urban Development (HUD) establishes a Fair Market Rent (FMR) for each metropolitan area that generally does not vary across a metropolitan area. The availability of rental units at rents less than the FMR, however, may vary considerably across a metropolitan area and between low- and high-poverty tracts. Do the limitations imposed through the FMRs inhibit entry of voucher holders into low-poverty areas? The research in this article attempts to explain the variation among metropolitan areas in terms of how well HCVP households are able to locate in low-poverty neighborhoods and tests the hypothesis that the level of the FMRs influences this process.

Literature Review

Using vouchers as a vehicle for deconcentrating poor households is not an articulated goal of the HCVP. The Section 8 Management Assessment Program (SEMAP) evaluates the performance of each PHA that administers the HCVP. Each PHA is given points for performance across 14 administrative areas, leading to a total performance score. Each PHA is given additional points if more of its HCVP households locate in tracts with lower poverty levels (HUD, 2013). Adding points to a PHA's SEMAP rating is, at best, a very minimal endorsement of the goal of poverty deconcentration. Moving poor households out of neighborhoods with high poverty levels and into neighborhoods with low poverty levels is, however, at least implicitly found in two rental assistance experiments supported by HUD.

The first experiment was the Gautreaux initiative. This program was born out of a court settlement, but it was, in effect, a quasi-experiment in the use of vouchers to promote racial integration (Rubinowitz and Rosenbaum, 2000). The effort offered a set of low-income, inner-city households a voucher with the condition that, to receive the voucher, each household must move to a racially integrated, suburban neighborhood. Although its purpose was racial integration, the high correlation between concentrated poverty and the presence of racial minorities meant that the Gautreaux experiment became a poverty deconcentration initiative in addition to its stated purpose of correcting past racial segregation. The households given vouchers with the requirement that they move to a racially integrated neighborhood were compared with another set of households given vouchers without a restriction on the neighborhoods where they could locate. Surveys of participants indicated that those households that moved to suburban locations were 16 percentage points more likely to have a job after they moved, although they did not work more hours or earn higher wages (Rosenbaum, 1995). Survey results also indicated that the children in the households that moved to the integrated suburbs were more likely to stay in school, to be employed after graduation, and to go on to 4-year colleges or universities (Popkin et al., 2000).

The results from the Gautreaux program were always suspect because of the problem of self-selection of the households that moved to the suburbs. The households that entered the program volunteered for participation knowing the requirement to move to the racially integrated suburbs. These households also knew that they would be subject to more stringent screening for past criminal behavior, for past performance in paying rent in a timely manner, and for care of the rental unit. This screening could have caused the movers to the suburbs to be a different population than the households that chose unrestricted vouchers.

Given the doubts that researchers expressed with the Gautreaux results and the desire to learn more about how to deconcentrate poor households, the Gautreaux initiative fostered HUD's Moving to Opportunity (MTO) for Fair Housing Demonstration (Goering, Feins, and Richardson, 2003). This second effort sought poverty deconcentration very explicitly, and the criteria for selecting a neighborhood did not contain a racial component. HUD offered a set of low-income households in five test cities vouchers with the condition that the household must locate in a census tract with a poverty rate of less than 10 percent, with no restrictions on the tract's racial composition or location in the central city or suburbs. The households were surveyed repeatedly during a period of years. The quality of their housing, employment, and health were assessed, as were their educational attainment and many other factors. These results were compared with those of households that

lived in public housing and of other households given vouchers but without any constraints on the poverty level in the neighborhood where they chose to locate. The MTO program had the distinct advantage over the Gautreaux program in that it was carefully designed to be an experiment. Efforts were taken to ensure that the experimental group (households given vouchers with the restriction that they move to low-poverty neighborhoods) could be compared directly with a control group who stayed in public housing and a control group offered vouchers without restriction on where they could move.

The results of the MTO program were mixed. Reviews of the experiment come from different sources. The final report to HUD by a team of researchers outlines the outcomes in some detail (Sanbonmatsu et al., 2011). For an ethnographic study of MTO households in three of the five cities, see Briggs, Popkin, and Goering (2010). A recent issue of *Cityscape*, edited by Ludwig (2012), not only covers the outcomes for the participating households but also reviews the experimental design, its implications from an international perspective, and possible policy responses.

A basic measure of the success of the MTO program is found in the percentage of households that were able to successfully lease a housing unit in a low-poverty tract and continue to reside in a low-poverty tract over time. The results indicate that it is not easy; only about one-half of the households that entered the program were successful at doing so (Shroder and Orr, 2012).

For those households that successfully entered the program, specific outcomes were examined across the five cities during a long period. The positive outcomes were limited but important. Gains for participating households were found in the health benefits realized by adults. MTO adults had a lower incidence of diabetes, extreme obesity, physical limitations, and psychological distress than did adults in the control groups. Many of these positive health benefits are associated with movement away from crime-intensive areas and into relatively crime-free areas. Reducing the stress resulting from a fear of crime appears to have beneficial physical and mental health effects (Sanbonmatsu et al., 2012). Neutral outcomes, even a few negative results, were found in the many tests made for hypothesized outcomes. For youths in the program, the study found few detectable benefits (Gennetian et al., 2012). Schooling outcomes were no different between those households that moved to low-poverty tracts and those that did not, even for those children who were of preschool age when they entered the program. The MTO program also had few detectable effects on physical health outcomes for young people. Where favorable outcomes were found, they tended to be among female youth, particularly on mental health outcomes. Less favorable patterns were found among male youth (Gennetian et al., 2012). The MTO program generated few effects on economic well-being, as measured through employment, earnings, household income, and the receipt of government assistance programs such as food stamps or Temporary Aid to Needy Families (Sanbonmatsu et al., 2012). Turner (2012: 215) offered, "One possible reason that MTO gains were limited to health outcomes is that the special mobility assistance provided by the demonstration did not enable families to gain and sustain access to high-opportunity neighborhoods." Success apparently takes more than a voucher and a directive to move to a tract with a poverty rate of less than 10 percent.

Even with this mixed success, calls have been made to ramp up efforts to use the HCVP as a mechanism to foster greater poverty deconcentration. Polikoff (2006) proposed that 50,000

vouchers be set aside each year for 10 years for MTO-style placement. The thrust of Polikoff's proposal is more focused on racial integration than on poverty discrimination, because he would limit these vouchers to African-American households that would move to low-poverty and low-minority census tracts. If implemented, this initiative could mean that 500,000 households relocate within a decade, meaning that as many as one in every four or five vouchers would be constrained for use in low-poverty areas. Briggs and Turner (2006) suggested that this proposal was slightly premature, because we do not yet know enough about what constitutes a desirable neighborhood for HCVP families. They proposed identifying high-opportunity neighborhoods to which voucher households would be guided. They argued that the identification of high-opportunity neighborhoods should assess the neighborhoods' safety, quality of schools, and access to jobs suitable to the assisted households. It is unfortunate that researchers find little agreement on what constitutes a high-opportunity neighborhood (McClure, 2010). At minimum, we can examine the extent to which HCVP families move to low-poverty neighborhoods and the variation among metropolitan areas in placing these households in low-poverty tracts.

Several studies evaluate the HCVP and its capacity to move households to high-opportunity neighborhoods. Pendall (2000), Basolo and Nguyen (2005), McClure (2010), and Galvez (2010) all examined the extent to which households with vouchers are able to locate in low-poverty tracts. All found that HCVP households are less likely to live in distressed, high-poverty neighborhoods than are other poor renter households but are more likely to do so than all renter households. All authors found that race is a factor; racial and ethnic minorities are less able to enter low-poverty tracts and are more concentrated in high-poverty tracts.

Devine et al. (2003) examined the 50 largest metropolitan areas in the nation to determine where HCVP households locate. Their study found that nearly 30 percent of HCVP households live in neighborhoods with a poverty rate of less than 10 percent and that 22 percent live in tracts with a poverty rate of more than 30 percent. To some extent, successful location in low-poverty areas is a function of living in suburbs versus living in central cities. More than one-third of central-city HCVP households live in tracts with poverty rates of more than 30 percent, but only 6 percent of suburban households live in high-poverty tracts. Race and ethnicity are factors; African-American and Hispanic households are more likely than White households to live in neighborhoods where poverty is concentrated, and White households are more likely than minority households to live in low-poverty tracts.

Galvez (2010) added a temporal component, finding that, although racial disparities persist, African Americans made modest gains over time, whereas Whites lost ground. Feins and Patterson (2005) found a tendency of HCVP households to make a sequence of moves from one year to the next, improving their neighborhood quality in terms of concentrated poverty.

The scale of the neighborhood matters. Nearly all these studies examined census tracts. Tracts can be too large, however, sufficiently large that clusters of HCVP households can form within tracts. These clusters can defeat the intended purpose of poverty deconcentration (Wang and Varady, 2005). Reconcentration of poor households can be a problem independent of the scale of the spatial unit of analysis. Hartung and Henig (1997) found that market forces and personal choices may cause HCVP households to cluster, creating new concentrations of poor households, even in otherwise vibrant metropolitan areas.

This body of research suggests that the HCVP is helping some households to successfully locate in low-poverty neighborhoods. Mandatory requirements that the participating household must move to a low-poverty tract were found to be less than successful. The MTO program may have suffered from being “a good idea weakly implemented” (Briggs, Popkin, and Goering, 2010). Most MTO households stayed in tracts within the same school district (Orr et al., 2003). Meeting the requirement to move to a tract with a poverty rate of less than 10 percent did not compel movement to an economically and racially integrated tract offering good employment prospects or high-performing schools. Moving households away from crime did produce some health benefits, but no economic benefits. A spatial element exists; suburbs show greater success than do central cities at providing housing in low-poverty tracts, but the generation of new poverty clusters remains a problem. Unanswered in this work is an exploration of how well HCVP households enter low-poverty tracts without an MTO mandate. Does the rate vary across metropolitan areas? What might explain the variation? Pendall (2000) specifically noted that market softness drives the process. Softer rental markets—those with greater vacancy rates—facilitate dispersal of poor households. Devine et al. (2003) found that the 50 largest metropolitan areas provide entry to low-poverty tracts at levels somewhat better than was true for the program as a whole, suggesting that larger metropolitan areas may be doing a better job. Does this finding mean that the scale of the market matters? Do larger metropolitan areas facilitate movement into low-poverty tracts? McClure (2010) found that the level of the FMR influences the number of units eligible for use by participating households. If the metropolitan area’s FMRs are more relative to market rents, does that facilitate entry into low-poverty tracts? This variable is the key test variable for this analysis, because it is within the domain of policy. HUD can do little about the size of the market where the HCVP operates or the vacancy rate. It can adjust the FMR if that adjustment could prove beneficial to helping deconcentrate poor households.

Data and Analysis

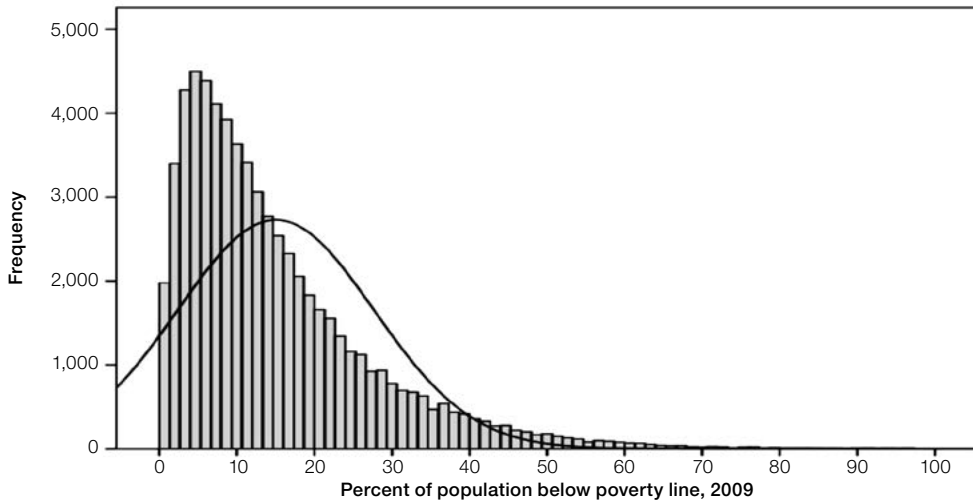
To help our understanding of where HCVP households choose to locate, this analysis examines metropolitan areas across the nation. The examination seeks to explain the variation in the shares of HCVP households in each metropolitan area that locate in low-poverty neighborhoods.

For this analysis, I prepared a national dataset at the census tract level from 2005–09 American Community Survey (ACS) 5-year data. Approximately 65,000 tracts exist nationwide, but this analysis is limited to the 51,000 located in the nation’s 276 metropolitan statistical areas (MSAs). The typical tract contains about 2,000 housing units, about 660 of them for renters. In this study, census tracts are viewed as neighborhoods. The data indicate that the average poverty level among metropolitan tracts is 14.6 percent, but that this poverty level is not normally distributed (see exhibit 1). Rather, most neighborhoods have relatively low poverty levels, and a small share suffer from very high poverty levels. About one-half of all tracts have poverty rates of less than 10 percent, whereas only about 6 percent of all metropolitan tracts have poverty rates of 40 percent or more.

For purposes of this study, a low-poverty neighborhood is defined as one with less than 10 percent poverty. This number is arbitrary, and others could have been chosen, but several arguments exist for using the median figure of 10 percent. First, it narrows the population of neighborhoods to those that are better than the 15-percent average, rather than including many that are about

Exhibit 1

Census Tracts by Percent of Population With Income Below Poverty Line (normal curve superimposed)



Source: 2005–09 American Community Survey 5-year data

average and perhaps less desirable as locations for HCVP households. Second, the number of neighborhoods available with poverty rates less than the 10-percent threshold is ample for the HCVP. One-half of all neighborhoods fit this standard, providing a great many rental housing units. Third, MTO adopted this threshold for its experimental program, and it was found to be workable. Not all applicant households were able to find units, but overall, the program was able to operate with households finding units meeting this requirement. Finally, the 10-percent level is comfortably less than the 15-percent threshold suggested by Galster (2005), less than which incremental growth in poverty has no negative effect on the receiving neighborhood.

I merged 2010 HUD administrative data with the ACS tract data. These data provide counts of households in the HCVP for each tract and describe about 2.08 million households. Only about 0.5 percent of the reported HCVP households could not be located in a tract, a very minimal loss of data. Note also that only vouchers in place are counted. At any given time, many vouchers are either in the process of being awarded to households on the waiting list or have been awarded but the household is still looking for a unit. Of these 2.08 million households, 1.78 million (85 percent) locate in metropolitan areas. It is these HCVP households that reside in metropolitan tracts that form the population for this study.

Descriptive Analysis of the Data

In general, the level of entry into low-poverty metropolitan areas by HCVP households is less than what might be expected (see exhibit 2).

Exhibit 2

Percent of HCVP Households Locating in Low-Poverty Neighborhoods for Metropolitan Statistical Areas

	Percent
All metropolitan statistical areas	
Mean percent	18.7
Standard deviation	11.7
Minimum	0.4
Maximum	67.8
Percent of neighborhoods with poverty below 10 percent	43.9
Percent of rental units in low-poverty neighborhoods	32.8
Percent of rental units offered for less than Fair Market Rent in low-poverty neighborhoods	26.1

HCVP = Housing Choice Voucher Program. N = 276.

Sources: U.S. Department of Housing and Urban Development HCVP data, 2010; 2005–09 American Community Survey 5-year data

Among the 276 metropolitan areas examined, 19 percent of all HCVP households locate in low-poverty tracts. This measure of HCVP entry into low-poverty tracts is normally distributed, with a standard deviation of 12 percentage points. The range is broad, with the lowest poverty metropolitan area at less than 1 percent and the highest poverty at 68 percent.

The interpretation of this 19-percent figure depends on the counterfactual employed. Compared with the number of low-poverty tracts, entry by HCVP participants is minimal. Whereas 19 percent of voucher households enter into low-poverty tracts, a much greater 44 percent of all metropolitan tracts qualify as low poverty. Thus, the voucher households are not distributed as would be expected if vouchers were evenly distributed across all tracts.

The scarcity of rental units may be partly to blame. Rental units are not distributed across the metropolitan tracts of the nation in a manner that is independent of the poverty level. Because the renter population is poorer than the owner population, rental units are more concentrated in moderate- and high-poverty tracts. Low-poverty tracts comprise nearly one-half of all neighborhoods, but they contain only 33 percent of all rental units. The HCVP gives mobility to the participating households, but the households cannot move to tracts where rental units do not exist.

Even where rental units exist, not all rental units are admissible into the HCVP. Rents are limited by the FMRs published by HUD. PHAs are granted some discretion to vary the program’s payment standards, which set the maximum amount of subsidy a household may receive. The FMR is, for most PHAs, set at the 40th percentile of rents in the metropolitan area. The payment standard is the maximum amount that a PHA will pay in support of a household. If the payment standard is set too low, households will have trouble finding units. If the payment standard is set too high, fewer households will be able to be assisted with the available program funds. To accommodate these problems, HUD permits PHAs to set payment standards for each unit size category at as low as 90 percent or as high as 110 percent of the FMR. Where extraordinary circumstances exist, HUD can permit PHAs to vary the payment standards further (HUD, 2001).

FMRs are generally the 40th percentile of rent paid by recent movers. Because they were set less than the median for new mover rents, and because rents for units without turnover tend to be less, the FMRs and the median gross rents in markets roughly align. Variation exists, however, for a variety of reasons. Some markets may use FMRs set at the 50th percentile through a provision granting higher rents to help HCVP households find and lease decent and affordable housing in high-cost markets. Some markets may have very high or very low turnover rates, causing variation in the spread between the FMRs and the typical rents in the market. Some markets may have FMRs that are much less than market rents because of a high incidence of new or luxurious housing, which HUD excludes from its data. Some metropolitan areas are split with multiple FMRs. All these reasons can contribute to variation between the FMRs and the median gross rents in a metropolitan area. This variation permits testing of the influence of different FMR levels on the capacity of HCVP households to locate in low-poverty tracts.

The rent limits imposed by the program therefore vary in each metropolitan area, but the FMRs loosely govern the program. They provide a good estimate of the availability of units that can enter into the program. The low level of entry of HCVP households into low-poverty neighborhoods may be a function of the absence of rental units offered for less than the FMR. Although 33 percent of rental units are located in low-poverty neighborhoods, only 26 percent of the rental units offered for less than the FMR are found in those neighborhoods. A rental housing price effect appears to correlate strongly with the incidence of poverty. Less-than-FMR units are not found in low-poverty neighborhoods in the same proportion as low-poverty neighborhoods are among all neighborhoods.

These conclusions are sensitive to the decision to use 10 percent as the threshold for inclusion in the low-poverty category of neighborhoods. If the threshold is raised to 15 percent, the problems of dissimilar distributions are significantly reduced. Thus, the category of neighborhoods with poverty rates of between 10 and 15 percent contain a great deal of rental housing, much of it priced less than the FMR. These neighborhoods with moderate amounts of poverty would not be considered good recipient neighborhoods for poor households with HCVP assistance, however, because the neighborhoods could be harmed by incremental increases in impoverished households, pushing them into above average poverty levels. Thus, the analysis continues with only those neighborhoods with poverty rates of less than 10 percent.

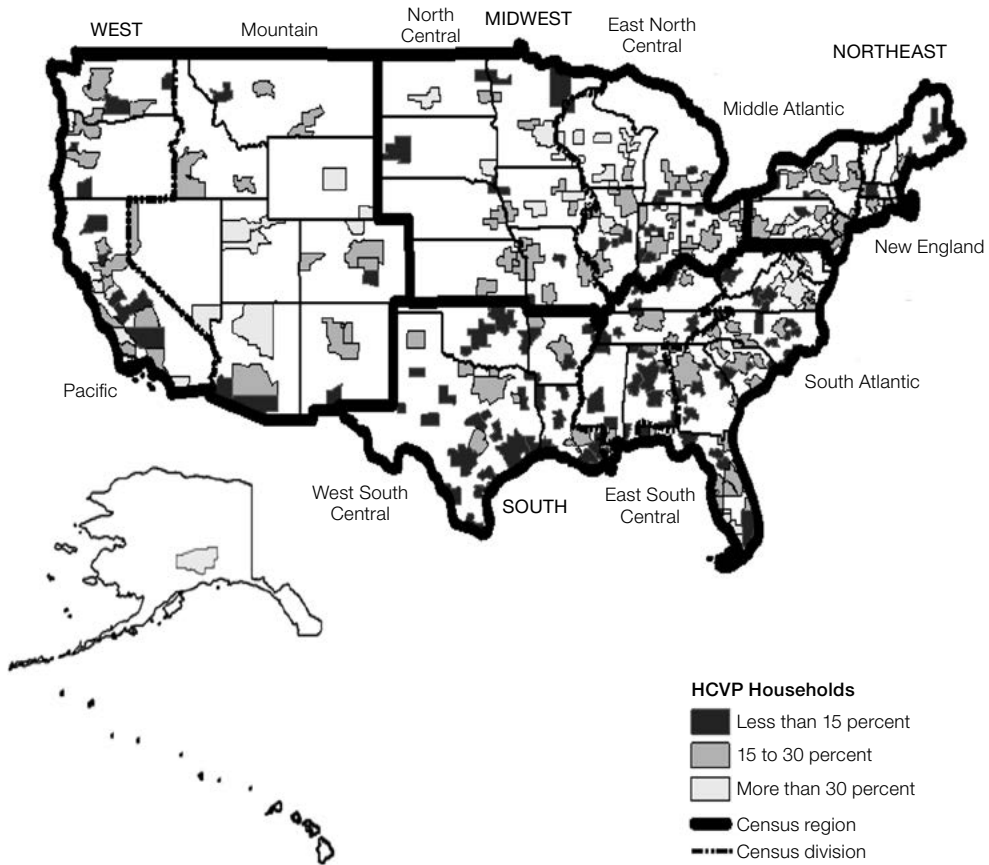
As a baseline, we can expect that 19 percent of voucher households will locate in low-poverty areas under the standard administration of the HCVP; that is, with only very minimal encouragement to PHAs to guide HCVP households to low-poverty tracts and with no effort to impose an MTO requirement at a national scale. This 19-percent entry into low-poverty tracts is 14 percentage points less than the availability of rental units and 7 percentage points less than the availability of units offered for less than the FMR.

Spatial Variation in the Percentage of HCVP Households Entering Low-Poverty Tracts

Metropolitan areas vary considerably in terms of the percentage of HCVP households entering into low-poverty neighborhoods. Exhibit 3 illustrates this variation. Of the 276 metropolitan statistical areas, 66 (24 percent) averaged less than 10 percent (roughly one-half of the national average)

Exhibit 3

Percent of HCVP Households Locating in Census Tracts With Poverty Rates of Less Than 10 Percent in Metropolitan Statistical Areas



HCVP = Housing Choice Voucher Program.

entering low-poverty neighborhoods, but 25 (9 percent) averaged greater than 35 percent (roughly twice the national average) entering low-poverty neighborhoods. The East South Central and West South Central division states and the Central Valley of California appear to have a high incidence of metropolitan areas averaging very low levels of HCVP entry into low-poverty neighborhoods. The northern Plains and New England division states appear to have a high incidence of metropolitan areas averaging very high levels.

Exhibit 3 suggests that region influences the level of HCVP entry into low-poverty tracts in the various metropolitan areas. Exhibit 4 breaks down the metropolitan areas by census region and division.

Metropolitan areas in the West and the Midwest regions seem to operate on par with the nation, at about 21 percent. The Northeast region averages more, at 24 percent, and the South region averages less, at only 14 percent.

Exhibit 4

Average Percent of HCVP Households Locating in Low-Poverty Neighborhoods by Census Region and Division in Metropolitan Statistical Areas

Region/Census Division	Mean Region (%)	Mean Division (%)	N
Northeast	24.4		35
New England		28.6	11
Middle Atlantic		22.4	24
Midwest	21.2		73
East North Central		18.8	45
West North Central		25.2	28
South	14.5		118
South Atlantic		18.4	53
East South Central		11.9	24
West South Central		10.9	41
West	21.2		50
Mountain		22.6	23
Pacific		19.9	27
All metropolitan statistical areas	18.7		276

HCVP = Housing Choice Voucher Program.

Sources: U.S. Department of Housing and Urban Development HCVP data, 2010; 2005–09 American Community Survey 5-year data

Looking one step closer, exhibit 4 refines the analysis into the nine census divisions, providing slightly more clarity. The New England division averages the most HCVP entry into low-poverty tracts, at 29 percent. The West North Central division, made up of the Plains states of Iowa, Kansas, Minnesota, Missouri, Nebraska, North Dakota, and South Dakota, is next, at 25 percent. The East South Central division (Alabama, Mississippi, Kentucky, and Tennessee) falls near the bottom. The West South Central division (Arkansas, Louisiana, Oklahoma, and Texas) averages the least, at 11 percent.

Washington, D.C., locates 44 percent of its HCVP households in low-poverty tracts, the highest level of entry among large metropolitan areas. This metropolitan area is in the South region, which does not fit the pattern. The second highest level, also 44 percent, does fit the pattern; it occurs in Las Vegas in the Mountain division of the West Region. The lowest levels of entry are found in the McAllen (less than 1 percent) and the El Paso (1.3 percent) metropolitan areas in Texas. Both are in the West South Central division, which fits the pattern of the South region averaging lower levels of entry than elsewhere.

Exhibit 5 identifies the greatest and least averages among larger metropolitan areas; that is, those with a population of greater than 800,000. The metropolitan areas with the most average placements of HCVP households in low-poverty tracts are not the ones that were expected. Washington, D.C., and San Francisco averaged among the highest levels of entry. Both areas are known for their high-priced, very competitive housing markets, attributes one would not typically associate with income integration. The metropolitan areas with the lowest levels of entry include the Fresno and Bakersfield, CA MSAs and the San Antonio-New Braunfels, TX MSA. Miami, Florida, another

Exhibit 5

Best and Worst Performing Large MSAs

MSA	Percent of HCVP Households Locating in Low-Poverty Neighborhoods
Best performing MSAs	
Washington-Baltimore-Arlington, DC-MD-VA-WV-PA	43.8
Las Vegas-Henderson-Paradise, NV	43.5
San Francisco-Oakland-Hayward, CA	42.6
Urban Honolulu, HI	40.4
Boston-Worcester-Providence, MA-RI-NH-CT	36.9
Salt Lake City, UT	35.2
Worst performing MSAs	
New Orleans-Metairie, LA	9.4
Tulsa, OK	8.9
Fresno, CA	6.7
San Antonio-New Braunfels, TX	6.1
Bakersfield, CA	5.2
Average for all MSAs	18.7

HCVP = Housing Choice Voucher Program. MSA = metropolitan statistical area.

Sources: U.S. Department of Housing and Urban Development HCVP data, 2010; 2005–09 American Community Survey 5-year data

metropolitan area with low average entry, saw its real estate bubble burst, which may be a factor, but the Las Vegas-Henderson-Paradise, NV MSA, also with a burst bubble, is among the metropolitan statistical areas with greatest average entry of HCVP households into low-poverty neighborhoods. (The appendix lists all metropolitan areas by their level of entry.)

The HCVP is administered relatively uniformly across the country. PHAs have some discretion in how they administer the program, but for the most part, no obvious reason explains why the program performs so differently across the nation. What then explains the variation?

Racial and Ethnic Variation in the Percentage of HCVP Households Entering Low-Poverty Neighborhoods

The previous studies of HCVP location patterns suggest that the racial and ethnic composition of the population being served influences the capacity of the HCVP household to locate in low-poverty tracts. If the program and the housing markets are neutral to race and ethnicity, the analysis should find the same percentage of HCVP households entering low-poverty neighborhoods across all racial and ethnic groups. In this study, non-Hispanic Whites are referred to as Whites, and non-Hispanic African Americans are referred to as African Americans. Hispanics of any race are referred to as Hispanics.

Exhibit 6 shows this parity not to be the case. The exhibit examines all voucher households in metropolitan areas. Across 1.8 million metropolitan voucher households nationwide, 21 percent reside in low-poverty neighborhoods, slightly more than the mean of 19 percent found when averaging the 276 metropolitan areas. Because large metropolitan areas tend to place more HCVP households in low-poverty tracts, the smaller metropolitan areas bias the average percent of HCVP households to locate in low-poverty tracts among metropolitan areas downward.

Exhibit 6

HCVP Households in MSAs Locating in Low-Poverty Tracts by Race and Ethnic Group

Racial/Ethnic Group	Count	Count in Low-Poverty Neighborhoods	Percent in Low-Poverty Neighborhoods	Increase in Low-Poverty Residency if 30%*	Percent of Group
White HCVP households	586,924	173,765	29.6		
African-American HCVP households	835,870	144,112	17.2	103,356	12.4
Hispanic HCVP households	299,581	47,583	15.9	41,111	13.7
Other race/ethnic group HCVP households	57,729	15,669	27.1	1,422	2.5
All HCVP households in MSAs	1,780,104	381,129	21.4	145,889	8.2

HCVP = Housing Choice Voucher Program. MSA = metropolitan statistical area.

* The number of additional HCVP households from each minority category who would locate in tracts with poverty rates below 10 percent if each minority group entered these low-poverty tracts at the same 30-percent rate as Whites.

Sources: U.S. Department of Housing and Urban Development HCVP data, 2010; 2005–09 American Community Survey 5-year data

About 30 percent of White households locate in low-poverty neighborhoods. Note that this 30-percent level approaches the 35 percent of rental units that are in low-poverty neighborhoods, which suggests that the HCVP provides the income augmentation to enable poor White households to compete successfully with nonpoor renter households in the market. It is important to note that the 30 percent entry by Whites exceeds the percentage of rental units with rents less than the FMR (26 percent) that are in low-poverty neighborhoods. This disproportionately high percentage of market entry by Whites means that, with housing choice vouchers, they are able to enter these desirable markets and compete for units against unsubsidized households, including households of much higher income levels.

Among minorities, the level of entry is predictably lower. About 17 percent of African Americans and 16 percent of Hispanics locate in low-poverty neighborhoods, levels much lower than their White counterparts. The level of minority entry is lower than the supply of rental units and the supply of units with rents less than the FMR. The 13-percentage-point differential between White and African-American households is substantial if taste for living in low-poverty tracts is the same. The 14-percentage-point difference between White and Hispanic households is similarly substantial.

If the share of African Americans and Hispanics living in low-poverty neighborhoods were the same as for Whites, about 103,000 additional African-American HCVP households (12 percent of the total) and 41,000 additional Hispanic households (14 percent of the total) would live in low-poverty neighborhoods. Race and ethnicity clearly influence the ability of HCVP households to locate in low-poverty neighborhoods. This issue may factor into the variation among metropolitan areas.

As is so often the case in studies of this type, it is unclear if discrimination or self-selection lies behind the different spatial distributions households by racial or ethnic group. Hispanics may self-select a level of segregation to accommodate a need to live where Spanish language services are provided. With any minority, it is difficult to distinguish among overt discrimination, fear of

discrimination, and self-selection based on a preference for living in a neighborhood with a high percentage of the same minority group. These forces cannot be separated with the data available to this study.

Models Explaining Variation in the Percentage of HCVP Households Among Metropolitan Areas

The exploratory analysis confirms variation among metropolitan areas in terms of the level of entry that HCVP households make into low-poverty tracts. Region of the nation, scale of the metropolitan area, and the racial and ethnic identity of the voucher household all appear to influence this process. The softness of the market plays a role, as does the share of tracts that qualify as low-poverty tracts. HUD can do little about these factors, but it can adjust the FMR levels that guide the implementation of the program. Higher FMRs could make more units eligible for HCVP households and could increase the level of entry by these households.

To test the validity of this concept and to see if higher FMRs do result in greater HCVP entry into low-poverty tracts, I prepared models to explain the variation across the metropolitan areas.¹ The first model includes all HCVP households, independent of race or ethnicity. Three additional models help to highlight the different location patterns of White HCVP households, African-American HCVP households, and Hispanic HCVP households. Exhibit 7 lists the descriptive statistics for the variables in these models.

The dependent variable for these models is the percentage of HCVP households that locate in tracts with less than 10 percent poverty. The unit of analysis is the metropolitan area, covering the 276 metropolitan areas for which complete data are available. The models contain independent control variables describing various characteristics of the various markets. These variables include market scale, testing whether larger markets operate differently. Scale is measured by the size of the population. Another important measure of a market's capacity to absorb HCVP households is the number of low-poverty neighborhoods relative to the whole. It is expected that a greater share of total tracts that have poverty rates of less than 10 percent will result in greater entry into such tracts.

Market softness, measured as the difference between the vacancy rate in the low-poverty neighborhoods and the metropolitan market as a whole, is also expected to influence the process. This approach is used because a household's location decision is driven by the relative vacancy between the low-poverty neighborhoods and the remainder of the neighborhoods. It would be expected that if vacancy rates are greater in low-poverty neighborhoods than in the market as a whole, it would be easier for HCVP households to locate in the low-poverty neighborhoods.

¹ The dependent variable is a proportion, constrained by a low of 0 and a high of 1, which can violate the assumptions of regression. The dependent variable, however, is fairly normally distributed, with a mean of 19 percent and with a standard deviation of 12 percentage points. The minimum is 0.4 percent and the maximum is 68.0 percent. The distribution does not include any significant frequencies at the extremes; rather, nearly all the cases are normally distributed away from the extremes. This distribution makes a linear form of the dependent variable defensible.

Exhibit 7

Descriptive Statistics of Variables Included in Models of HCVP Household Entry Into Low-Poverty Tracts

Variable	Mean	Standard Deviation
Percent of all HCVP households to neighborhoods with poverty rates of less than 10%	18.73	11.70
Percent of White HCVP households to neighborhoods with poverty rates of less than 10%	23.81	13.65
Percent of African-American HCVP households to neighborhoods with poverty rates of less than 10%	15.23	11.48
Percent of Hispanic HCVP households to neighborhoods with poverty rates of less than 10%	19.29	14.38
Population (millions)	0.88	2.08
Share of neighborhoods that are low poverty	39.33	15.59
Region of the market (Mid-Atlantic reference)		
Region 1 New England	0.04	0.20
Region 3 East North Central	0.16	0.37
Region 4 West North Central	0.10	0.30
Region 5 South Atlantic	0.19	0.39
Region 6 East South Central	0.09	0.28
Region 7 West South Central	0.15	0.36
Region 8 Mountain	0.08	0.28
Region 9 Pacific	0.10	0.30
Relative market softness		
Vacancy in low-poverty neighborhoods minus vacancy in all neighborhoods	- 0.57	2.85
Rental units less than FMR		
Percent less than FMR in low-poverty neighborhoods minus all neighborhoods	- 10.67	6.43
Ratio of FMR to median gross rent	0.99	0.07

FMR = Fair Market Rent. HCVP = Housing Choice Voucher Program.

Sources: U.S. Department of Housing and Urban Development HCVP data, 2010; 2005–09 American Community Survey 5-year data

Race is known to influence the capacity of minorities to locate freely across metropolitan markets. To control for the capacity to locate, two dissimilarity indexes are included in the models. The first measures the spatial differences between Whites and African Americans, and the second measures the spatial differences between Whites and Hispanics.²

No obvious reason explains why region of the nation should matter, but it clearly does. As such, dummy variables are entered for region. These regional variables serve as controls for other fixed effects that are unobserved in the available data.

² The dissimilarity index is the sum of the absolute values of $\{[(P_{i1}/P_1)-(P_{i2}/P_2)]/2\} \times 100$, where P_{i1} is the count of a reference population, such as Whites, in a tract; P_1 is the count of the entire reference population, such as Whites in the metropolitan area; P_{i2} is the count of a comparison population, such as African Americans, in a tract; and P_2 is the count of the entire comparison population, such as African Americans, in the metropolitan area. The index is interpreted as the percentage of the comparison population that would need to locate for the comparison population to be evenly distributed across all areas. (See White, 1983.)

Finally, variables are entered that measure the availability of units rented for less than the applicable FMR. One variable measures the difference between the percentage of units available for less than the FMR in low-poverty neighborhoods and in the market as a whole. As with vacancy, if low-poverty areas have a greater proportion of rental units available for less than the FMR than elsewhere in the market, those neighborhoods are expected to attract more HCVP households. A second variable assesses the how much the FMR is relative to typical rents in the market. This variable is the ratio of the FMR to the median gross rent in the metropolitan area. It is expected that the greater the ratio, the greater will be the entry of HCVP households into low-poverty areas.

Exhibit 8 lists the details of the various models.³ Model 1 explains the variation in HCVP entry into low-poverty neighborhoods for all HCVP households. The model is fairly sturdy, with an R-square statistic of 0.78. The outcomes for the control variables are informative.

The control variable that adds the greatest explanatory power to the model is the variable measuring the percentage of neighborhoods in the metropolitan area that are low poverty. It suggests, unsurprisingly, that the greater the share of low-poverty tracts, the greater the entry by HCVP households. It is highly significant and unambiguous. If the housing market offers a large proportion of its tracts as targets for location, an HCVP household is more likely to end up there.

Scale of the metropolitan area does not matter much when other controlling variables are entered into the model.

The market softness variable, the vacancy differential between low-poverty tracts and the market as a whole, is positive and significant. It suggests that HCVP households respond to market softness in an economically rational manner. If the market is softer inside the low-poverty tracts, then HCVP households will locate in these low-poverty tracts. If the market is softer outside the low-poverty tracts, then HCVP households will locate in higher poverty tracts. The coefficient for this variable indicates that tight markets in low-poverty tracts can inhibit HCVP households from locating in desirable tracts, and soft markets can facilitate the poverty deconcentration process.

Two variables examine the level of the applicable FMRs. These variables have particular significance because the FMR is a component of the program that program administrators can adjust. The first variable indicates that greater entry is also associated with greater proportions of units offered for less than the FMR in low-poverty neighborhoods relative to the market as a whole. The second variable suggests that greater entry into low-poverty tracts is associated with FMRs being greater relative to the typical rents in a market. These two results both follow from expectations.

Models 2, 3, and 4 explain the variation in entry to low-poverty neighborhoods for White, African-American, and Hispanic HCVP households. The models are less sturdy, with R-square statistics of 0.68 for White, 0.68 for African-American, and 0.66 for Hispanic HCVP households, but they are

³ Note that the models are weighted least squares models because the dependent variables are proportions. Because proportions are constrained by a minimum of 0 and a maximum of 1, they may introduce inconsistency into the model. This problem is not significant because the proportions are normally distributed around the means of 15 to 24 percent, with no significant frequencies at the extremes of 0 or 1. Because of the variation in the denominator of each dependent variable, the count of HCVP households in the metropolitan area, however, the cases are weighted as a function of this count.

Exhibit 8

Models Explaining Variation in the Percent of HCVP Households Locating in Low-Poverty Neighborhoods in Metropolitan Areas, by Race and Ethnicity

Variable	Model 1 All HCVP HH	Model 2 White HCVP HH	Model 3 African- American HCVP HH	Model 4 Hispanic HCVP HH
Dependent variable	Percent of all HCVP HH to neighborhoods with poverty less than 10%	Percent of White HCVP HH to neighborhoods with poverty less than 10%	Percent of African-American HCVP HH to neighborhoods with poverty less than 10%	Percent of Hispanic HCVP HH to neighborhoods with poverty less than 10%
Independent variables				
Scale of the market population (millions)	- 0.083	- 0.0343	0.101	- 0.083
Share of neighborhoods that are low poverty	0.739**	0.581**	0.808**	0.778**
Dissimilarity index: White-to-African American	- 0.209**	0.133*	- 0.289**	- 0.162*
Dissimilarity index: White-to-Hispanic	0.000	- 0.056	- 0.091	- 0.064
Region of the market (Mid-Atlantic reference)				
1-New England	1.637	5.693*	0.674	- 3.820
3-East North Central	4.991**	4.403*	5.776**	12.804**
4-West North Central	4.215**	6.371**	4.545*	9.313**
5-South Atlantic	6.629**	3.459*	9.825**	21.258**
6-East South Central	7.574**	5.674*	10.372**	20.966**
7-West South Central	7.284**	3.357	10.666**	15.342**
8-Mountain	9.579**	8.803**	9.008**	13.452**
9-Pacific	8.205**	7.549**	3.923**	15.259**
Relative market softness				
Vacancy in low-poverty neighborhoods minus vacancy in all neighborhoods	0.441*	0.364	0.314	0.503
Rental units < FMR				
Percent < FMR in low-poverty neighborhoods minus all neighborhoods	0.333**	0.501**	- 0.017	0.365**
Ratio of FMR to median gross rent	19.607**	32.831**	11.865	21.424**
Constant	- 21.364	- 35.905	- 16.719	- 31.196
R square	0.782	0.679	0.677	0.656
No. of metropolitan areas	276	276	276	275

FMR = Fair Market Rent. HCVP = Housing Choice Voucher Program. HH = households.

**significant at .05. **significant at .01.*

Note: Weighted least squares using count of HCVP households in the market as the weight.

adequate to test some of the issues. The models for each racial or ethnic subpopulation generally work very similarly to the model for all HCVP households. The models for African Americans and Hispanics have much lower constants than is found in the models for Whites, indicating that racial or ethnic minorities enter low-poverty tracts less, independent of the other controlling factors in the models. In each model for Whites or minorities, the variable for the share of all neighborhoods that are low-poverty continues to contribute the greatest explanatory power. The dissimilarity index for the African American-to-White differential is significant for African-American HCVP households, as would be expected. The coefficient for the Hispanic-to-White index is not significant for Hispanic HCVP households, which is unexpected. The coefficients for the two variables describing the relative and absolute levels of the FMRs are significant for Hispanics and for Whites, as was true for the total population of HCVP households. These coefficients are not significant in the model for African Americans, which suggests that modifications to the FMRs may be more effective in generating poverty deconcentration for Whites and Hispanics and less so for African Americans.

Conclusions and Policy Implications

The HCVP is achieving much, but it could achieve more. HCVP households are not making entry into low-poverty tracts at levels that might be expected. Their entry is not even up to the share of units with rents less than the FMR. What causes these less-than-expected levels of market entry is unclear.

Unmeasured in this analysis is the capacity of HCVP households to compete for available units in low-poverty neighborhoods. It is possible that the asymmetric market power of upper-income households is at fault. Upper-income households have the option to spend a lower percentage of their income on housing. They can compete very well for low-priced rental units in desirable neighborhoods. Landlords will generally prefer a higher income household when choosing between two households applying for a lease. The higher level of income better insulates the household from problems in making rent payments should the flow of that income be interrupted. The competition between HCVP households and other, especially upper-income, households could be greater in low-poverty neighborhoods, thereby pushing HCVP households out of these neighborhoods. It is also possible that landlord resistance to accepting a housing choice voucher as a means of payment may be greater in low-poverty neighborhoods. Landlords in low-poverty neighborhoods will generally have greater capacity to refuse a voucher applicant, knowing that a non-HCVP household will likely come along. Landlords are beginning to lose this capacity, however, as states and communities adopt prohibitions on source-of-income discrimination. These laws effectively prohibit a landlord from refusing an application from an HCVP household solely because of the use of a voucher. Landlord resistance and increased competition for units, however, can push down the percentage of HCVP households that can successfully enter low-poverty neighborhoods.

We learn from the analysis of metropolitan markets that White HCVP households can overcome these barriers, entering low-poverty neighborhoods at a rate greater than the share of units offered at rents less than the FMR limits. This finding means that HCVP households can successfully seek out, negotiate for, and lease these units, perhaps because racial barriers do not stand in their way. For White HCVP households to be found in low-poverty neighborhoods in greater proportion than the share of units available for less than the FMR means that landlord resistance and competition

from higher income households is not prohibitive. The promise of the HCVP is to augment the incomes of extremely low-income households such that they can enter into the market for good-quality housing. A significant share of HCVP households is evidently realizing this promise. Barriers appear to exist for racial and ethnic minorities. The data available here do not permit us to know the extent to which these barriers result from self-selection by minority households, from actual discrimination, or from fear of confronting discrimination. Whatever the source or sources, racial differences in the ability of HCVP households to enter low-poverty tracts are large.

The analysis indicates that the level of the FMR does influence the success with which HCVP households enter low-poverty neighborhoods. The models indicate, with some ambiguity, that if FMRs were raised so that the share of units in low-poverty neighborhoods offered for less than the FMR could be increased, then the share of HCVP households that locate there would rise. Selective adjustments to the FMRs must be done with care, however, recognizing the local market forces that influence the availability of units in high-opportunity tracts. The analysis in this article is performed at the level of census tracts, which may be too large a spatial unit for identifying neighborhoods. The analysis suggests that, if it is desirable to facilitate entry into low-poverty tracts, then FMRs should be raised in these tracts, and perhaps even in smaller neighborhoods, and not in in the moderate- or high-poverty tracts which may be harmed by the presence of additional poverty.

As we learn more about the ability of the HCVP to help poor households locate into good-quality housing in opportunity-rich tracts, it appears the voucher households can compete well. Race and ethnicity remain forces that separate people. The research reported here, however, suggests that HUD can facilitate the process by selectively altering the FMR in target neighborhoods. The results presented here indicate that small-area FMRs hold promise. FMRs set for a spatial unit much smaller than a metropolitan area, if carefully implemented, can increase the number of rental units that qualify for placing HCVP households into high-opportunity neighborhoods. Such small-area FMRs will improve the capacity of the HCVP to deconcentrate poor households, but they are not a panacea. Other actions may need to be explored and adopted. Metropolitan area administration of the HCVP could increase the information flow on available units to households. More intensive housing counseling is a proven technique that can help guide HCVP households to high-opportunity neighborhoods. Enforcing fair housing laws can help racial and ethnic minorities gain access to markets previously closed to them. All these approaches have merit. The evidence from this research indicates that carefully adjusting FMR levels can increase poverty deconcentration with minimal effect on the program budget. Raising FMRs, however, unfortunately does distribute the available program funds across a smaller number of participating households. Further study is needed to determine whether the beneficial effects of helping HCVP households into low-poverty tracts justify the reduced numbers of households served.

Appendix

Exhibit A1

Percent of HCVP Households Locating in Low-Poverty Neighborhoods for Metropolitan Areas (1 of 6)

Abilene, TX MSA	2.42
Albany, GA MSA	10.47
Albany-Schenectady-Troy, NY MSA	29.83
Albuquerque, NM MSA	16.53
Alexandria, LA MSA	4.82
Allentown-Bethlehem-Easton, PA MSA	32.87
Altoona, PA MSA	19.58
Amarillo, TX MSA	23.42
Anchorage, AK MSA	32.17
Anniston, AL MSA	9.01
Appleton-Oshkosh-Neenah, WI MSA	42.16
Asheville, NC MSA	22.73
Athens, GA MSA	5.98
Atlanta, GA MSA	18.34
Auburn-Opelika, AL MSA	19.33
Augusta-Aiken, GA-SC MSA	2.28
Austin-San Marcos, TX MSA	26.76
Bakersfield, CA MSA	5.19
Bangor, ME MSA	13.31
Barnstable-Yarmouth, MA MSA	67.06
Baton Rouge, LA MSA	15.32
Beaumont-Port Arthur, TX MSA	10.59
Bellingham, WA MSA	19.68
Benton Harbor, MI MSA	2.75
Billings, MT MSA	21.89
Biloxi-Gulfport-Pascagoula, MS MSA	17.86
Binghamton, NY MSA	16.55
Birmingham, AL MSA	10.84
Bismarck, ND MSA	67.75
Bloomington, IN MSA	9.16
Bloomington-Normal, IL MSA	20.09
Boise City, ID MSA	28.07
Boston-Worcester-Lawrence, MA-NH-ME-CT CMSA	36.87
Brownsville-Harlingen-San Benito, TX MSA	.51
Bryan-College Station, TX MSA	3.37
Buffalo-Niagara Falls, NY MSA	12.96
Burlington, VT MSA	34.79
Canton-Massillon, OH MSA	17.23
Casper, WY MSA	32.72
Cedar Rapids, IA MSA	39.33
Champaign-Urbana, IL MSA	5.99
Charleston, WV MSA	18.00
Charleston-North Charleston, SC MSA	14.57
Charlotte-Gastonia-Rock Hill, NC-SC MSA	17.36
Charlottesville, VA MSA	56.33
Chattanooga, TN-GA MSA	15.79
Cheyenne, WY MSA	53.46
Chicago-Gary-Kenosha, IL-IN-WI CMSA	22.45

Exhibit A1

Percent of HCVP Households Locating in Low-Poverty Neighborhoods for Metropolitan Areas (2 of 6)

Metropolitan Area	Percent of HCVP Households to Low-Poverty Tracts
Chico-Paradise, CA MSA	16.67
Cincinnati-Hamilton, OH-KY-IN CMSA	19.96
Clarksville-Hopkinsville, TN-KY MSA	10.63
Cleveland-Akron, OH CMSA	17.65
Colorado Springs, CO MSA	29.62
Columbia, MO MSA	14.23
Columbia, SC MSA	23.62
Columbus, GA-AL MSA	6.98
Columbus, OH MSA	17.47
Corpus Christi, TX MSA	6.54
Corvallis, OR MSA	8.26
Cumberland, MD-WV MSA	18.59
Dallas-Fort Worth, TX CMSA	18.48
Danville, VA MSA	7.95
Davenport-Moline-Rock Island, IA-IL MSA	23.53
Dayton-Springfield, OH MSA	20.62
Daytona Beach, FL MSA	21.66
Decatur, AL MSA	1.30
Decatur, IL MSA	12.41
Denver-Boulder-Greeley, CO CMSA	23.20
Des Moines, IA MSA	38.71
Detroit-Ann Arbor-Flint, MI CMSA	19.01
Dothan, AL MSA	8.09
Dover, DE MSA	19.48
Dubuque, IA MSA	43.04
Duluth-Superior, MN-WI MSA	11.97
Eau Claire, WI MSA	38.19
El Paso, TX MSA	1.38
Elkhart-Goshen, IN MSA	30.61
Elmira, NY MSA	4.39
Enid, OK MSA	19.49
Erie, PA MSA	17.67
Eugene-Springfield, OR MSA	17.59
Evansville-Henderson, IN-KY MSA	13.68
Fargo-Moorhead, ND-MN MSA	26.60
Fayetteville, NC MSA	7.18
Fayetteville-Springdale-Rogers, AR MSA	19.72
Flagstaff, AZ-UT MSA	32.29
Florence, AL MSA	15.77
Florence, SC MSA	11.28
Fort Collins-Loveland, CO MSA	30.70
Fort Myers-Cape Coral, FL MSA	33.46
Fort Pierce-Port St. Lucie, FL MSA	23.00
Fort Smith, AR-OK MSA	3.53
Fort Walton Beach, FL MSA	23.98
Fort Wayne, IN MSA	25.44

Exhibit A1

Percent of HCVP Households Locating in Low-Poverty Neighborhoods for Metropolitan Areas (3 of 6)

Metropolitan Area	Percent of HCVP Households to Low-Poverty Tracts
Fresno, CA MSA	6.73
Gadsden, AL MSA	17.95
Gainesville, FL MSA	7.75
Glens Falls, NY MSA	16.83
Goldsboro, NC MSA	11.11
Grand Forks, ND-MN MSA	5.16
Grand Junction, CO MSA	15.04
Grand Rapids-Muskegon-Holland, MI MSA	20.59
Great Falls, MT MSA	16.97
Green Bay, WI MSA	33.56
Greensboro--Winston-Salem--High Point, NC MSA	14.03
Greenville, NC MSA	3.87
Greenville-Spartanburg-Anderson, SC MSA	18.50
Harrisburg-Lebanon-Carlisle, PA MSA	42.37
Hartford, CT MSA	23.86
Hattiesburg, MS MSA	4.83
Hickory-Morganton-Lenoir, NC MSA	15.58
Honolulu, HI MSA	40.41
Houma, LA MSA	14.36
Houston-Galveston-Brazoria, TX CMSA	13.24
Huntington-Ashland, WV-KY-OH MSA	11.43
Huntsville, AL MSA	22.31
Indianapolis, IN MSA	15.11
Iowa City, IA MSA	28.47
Jackson, MI MSA	13.30
Jackson, MS MSA	7.39
Jackson, TN MSA	11.33
Jacksonville, FL MSA	21.38
Jacksonville, NC MSA	8.98
Jamestown, NY MSA	10.64
Janesville-Beloit, WI MSA	31.17
Johnson City-Kingsport-Bristol, TN-VA MSA	8.81
Johnstown, PA MSA	19.03
Jonesboro, AR MSA	12.18
Joplin, MO MSA	3.81
Kalamazoo-Battle Creek, MI MSA	9.38
Kansas City, MO-KS MSA	25.32
Killeen-Temple, TX MSA	13.32
Knoxville, TN MSA	12.44
Kokomo, IN MSA	10.54
La Crosse, WI-MN MSA	38.79
Lafayette, IN MSA	16.93
Lafayette, LA MSA	5.08
Lake Charles, LA MSA	11.87
Lakeland-Winter Haven, FL MSA	25.35
Lancaster, PA MSA	28.64

Exhibit A1

Percent of HCVP Households Locating in Low-Poverty Neighborhoods for Metropolitan Areas (4 of 6)

Metropolitan Area	Percent of HCVP Households to Low-Poverty Tracts
Lansing-East Lansing, MI MSA	16.60
Laredo, TX MSA	2.87
Las Cruces, NM MSA	.35
Las Vegas, NV-AZ MSA	43.50
Lawrence, KS MSA	20.88
Lawton, OK MSA	6.71
Lewiston-Auburn, ME MSA	7.86
Lexington, KY MSA	15.44
Lima, OH MSA	8.82
Lincoln, NE MSA	19.55
Little Rock-North Little Rock, AR MSA	17.03
Longview-Marshall, TX MSA	9.28
Los Angeles-Riverside-Orange County, CA CMSA	20.81
Louisville, KY-IN MSA	13.32
Lubbock, TX MSA	9.54
Lynchburg, VA MSA	5.26
Macon, GA MSA	13.77
Madison, WI MSA	38.59
Mansfield, OH MSA	17.65
McAllen-Edinburg-Mission, TX MSA	.69
Medford-Ashland, OR MSA	6.06
Melbourne-Titusville-Palm Bay, FL MSA	32.67
Memphis, TN-AR-MS MSA	10.02
Merced, CA MSA	1.94
Miami-Fort Lauderdale, FL CMSA	10.77
Milwaukee-Racine, WI CMSA	23.53
Minneapolis-St. Paul, MN-WI MSA	34.19
Missoula, MT MSA	4.61
Mobile, AL MSA	7.15
Modesto, CA MSA	34.95
Monroe, LA MSA	10.41
Montgomery, AL MSA	13.55
Muncie, IN MSA	18.98
Myrtle Beach, SC MSA	13.46
Naples, FL MSA	34.44
Nashville, TN MSA	18.47
New London-Norwich, CT-RI MSA	44.86
New Orleans, LA MSA	9.42
New York-Northern New Jersey-Long Island, NY-NJ-CT MSA	19.25
Norfolk-Virginia Beach-Newport News, VA-NC MSA	26.73
Ocala, FL MSA	10.36
Odessa-Midland, TX MSA	8.30
Oklahoma City, OK MSA	12.08
Omaha, NE-IA MSA	22.14
Orlando, FL MSA	21.07
Owensboro, KY MSA	13.11

Exhibit A1**Percent of HCVP Households Locating in Low-Poverty Neighborhoods for Metropolitan Areas (5 of 6)**

Metropolitan Area	Percent of HCVP Households to Low-Poverty Tracts
Panama City, FL MSA	23.29
Parkersburg-Marietta, WV-OH MSA	10.22
Pensacola, FL MSA	9.78
Peoria-Pekin, IL MSA	31.50
Philadelphia-Wilmington-Atlantic City, PA-NJ-DE-MD	22.41
Phoenix-Mesa, AZ MSA	22.63
Pine Bluff, AR MSA	2.82
Pittsburgh, PA MSA	17.39
Pittsfield, MA MSA	21.11
Pocatello, ID MSA	19.88
Portland, ME MSA	29.67
Portland-Salem, OR-WA CMSA	19.09
Providence-Fall River-Warwick, RI-MA MSA	26.53
Provo-Orem, UT MSA	32.22
Pueblo, CO MSA	12.96
Punta Gorda, FL MSA	38.63
Raleigh-Durham-Chapel Hill, NC MSA	28.90
Rapid City, SD MSA	9.71
Reading, PA MSA	30.17
Redding, CA MSA	4.62
Reno, NV MSA	18.20
Richland-Kennewick-Pasco, WA MSA	22.29
Richmond-Petersburg, VA MSA	34.15
Roanoke, VA MSA	14.69
Rochester, MN MSA	42.80
Rochester, NY MSA	26.05
Rockford, IL MSA	16.18
Rocky Mount, NC MSA	3.59
Sacramento-Yolo, CA CMSA	28.97
Saginaw-Bay City-Midland, MI MSA	7.61
St. Cloud, MN MSA	27.93
St. Joseph, MO MSA	16.33
St. Louis, MO-IL MSA	20.40
Salinas, CA MSA	17.44
Salt Lake City-Ogden, UT MSA	35.19
San Angelo, TX MSA	4.91
San Antonio, TX MSA	6.10
San Diego, CA MSA	32.19
San Francisco-Oakland-San Jose, CA CMSA	42.62
San Luis Obispo-Atascadero-Paso Robles, CA MSA	41.11
Santa Barbara-Santa Maria-Lompoc, CA MSA	24.10
Santa Fe, NM MSA	18.19
Sarasota-Bradenton, FL MSA	24.14
Savannah, GA MSA	15.51
Scranton--Wilkes-Barre--Hazleton, PA MSA	20.23
Seattle-Tacoma-Bremerton, WA CMSA	29.45

Exhibit A1

Percent of HCVP Households Locating in Low-Poverty Neighborhoods for Metropolitan Areas (6 of 6)

Metropolitan Area	Percent of HCVP Households to Low-Poverty Tracts
Sharon, PA MSA	20.06
Sheboygan, WI MSA	40.51
Sherman-Denison, TX MSA	27.01
Shreveport-Bossier, LA MSA	9.77
Sioux City, IA-NE MSA	11.39
Sioux Falls, SD MSA	37.43
South Bend, IN MSA	8.72
Spokane, WA MSA	12.83
Springfield, IL MSA	11.71
Springfield, MA MSA	9.18
Springfield, MO MSA	18.91
State College, PA MSA	52.87
Steubenville-Weirton, OH-WV MSA	17.48
Stockton-Lodi, CA MSA	17.04
Sumter, SC MSA	9.43
Syracuse, NY MSA	17.09
Tallahassee, FL MSA	12.36
Tampa-St. Petersburg-Clearwater, FL MSA	20.15
Terre Haute, IN MSA	7.93
Texarkana, TX-Texarkana, AR MSA	12.27
Toledo, OH MSA	12.63
Topeka, KS MSA	20.20
Tucson, AZ MSA	11.43
Tulsa, OK MSA	8.91
Tuscaloosa, AL MSA	12.62
Tyler, TX MSA	24.73
Utica-Rome, NY MSA	18.55
Victoria, TX MSA	5.45
Visalia-Tulare-Porterville, CA MSA	15.29
Waco, TX MSA	5.76
Washington-Baltimore, DC-MD-VA-WV CMSA	43.80
Waterloo-Cedar Falls, IA MSA	18.73
Wausau, WI MSA	33.99
West Palm Beach-Boca Raton, FL MSA	17.62
Wheeling, WV-OH MSA	15.11
Wichita, KS MSA	17.39
Wichita Falls, TX MSA	25.62
Williamsport, PA MSA	13.49
Wilmington, NC MSA	12.27
Yakima, WA MSA	8.72
York, PA MSA	29.34
Youngstown-Warren, OH MSA	7.57
Yuba City, CA MSA	11.97
Yuma, AZ MSA	.79

CMSA = consolidated metropolitan statistical area. HCVP = Housing Choice Voucher Program. MSA = metropolitan statistical area.

Author

Kirk McClure is a professor in the Department of Urban Planning at The University of Kansas.

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Data Shop

Data Shop, a department of Cityscape, presents short articles or notes on the uses of data in housing and urban research. Through this department, the Office of Policy Development and Research introduces readers to new and overlooked data sources and to improved techniques in using well-known data. The emphasis is on sources and methods that analysts can use in their own work. Researchers often run into knotty data problems involving data interpretation or manipulation that must be solved before a project can proceed, but they seldom get to focus in detail on the solutions to such problems. If you have an idea for an applied, data-centric note of no more than 3,000 words, please send a one-paragraph abstract to david.a.vandenbroucke@hud.gov for consideration.

Comparing Households in HUD Rental Assistance Programs With PUMS Data

Brent D. Mast

U.S. Department of Housing and Urban Development

The views expressed in this article are those of the author and do not represent the official positions or policies of the Office of Policy Development and Research or the U.S. Department of Housing and Urban Development.

Abstract

In February 2012, the U.S. Department of Housing and Urban Development (HUD) launched a new Public Use Microdata Sample (PUMS) database, which contains household-level data for 5 percent of households in five of HUD's largest rental assistance programs. PUMS includes household characteristics as well as geographic information, enabling researchers to perform analyses not possible using other datasets.

This article describes the PUMS data and sampling methodology, and it compares the PUMS with other data sources. A data analysis example is presented using PUMS data comparing rent burdens across programs, adjusting for income differences using Barskey et al.'s (2002) nonparametric technique. Before accounting for income differences, rent burdens are much higher in the Housing Choice Voucher Program (HCVP) compared with HUD's other rental assistance programs. Results indicate that when comparing households that have similar incomes, rent burdens of HCVP households are even higher compared with those of other assisted households.

Introduction

To advance the federal government's *Open Government Initiative*, in February 2012, the U.S. Department of Housing and Urban Development (HUD) launched a public database to help the research community better understand the characteristics of households receiving assistance under five of the Department's largest rental programs.

HUD's new Public Use Microdata Sample (PUMS) database¹ (HUD, 2012) includes household-level data for 5 percent of households assisted through five HUD programs: (1) the Housing Choice Voucher Program (HCVP), (2) public housing (PH), (3) Section 8 Project-Based (PBS8) Rental Assistance, (4) the Supportive Housing for the Elderly Section 202 program (S202), and (5) the Supportive Housing for Persons with Disabilities Section 811 program (S811).

HCVP tenants find rental units in the private market, paying at least 30 percent of their own income toward rent and utilities; the remainder of the rent is subsidized using a HUD voucher. PH tenants live in housing owned and operated by public housing agencies. PBS8 tenants live in privately owned and operated developments, where HUD subsidizes some, or all, housing units. S202 subsidizes privately owned and operated supportive housing developments for the elderly, and S811 subsidizes privately owned and operated supportive housing developments for persons with disabilities.

The 2009, 2010, and 2012 PUMS data currently are available, and annual updates are planned. The PUMS includes household characteristics and geographic information.

Using these household-level data, researchers can calculate results and statistical relationships at levels of demographic or geographic detail not available in HUD's tabular reports.

To protect tenant privacy, the PUMS contains no personally identifiable information, such as addresses, to ensure that it will not be possible to identify any individual or household. Some variables that have a high identification risk have been categorized, top-coded, or masked. The sample size is large enough to be representative of states and the nation as a whole, but it is small enough to preserve confidentiality.

The next section describes the PUMS data and sampling methodology. The following section compares the PUMS with other data sources. The section after that provides a data analysis example that compares rent burdens across programs that are adjusted for income differences, using Barskey et al.'s (2002) nonparametric method. The final section presents the author's conclusions.

Data Description

This section describes the PUMS scope, sources, sampling methodology, and variables. More information is available in the data dictionaries on the PUMS HUD USER webpage (HUD, 2012).

¹ Users must register before accessing PUMS data (HUD, 2012). Users must provide their names, institutions, and e-mail addresses and certify that they will use the data for legitimate research purposes and will in no way use the data to try to identify households.

Programs

The PUMS contains separate datasets for households assisted by programs administered by HUD's Office of Public and Indian Housing (PIH) and Office of Housing. The PUMS contains data for the two largest PIH programs: PH and the HCVP. The PUMS contains data on three Office of Housing multifamily programs: PBS8, S202, and S811. Exhibit 1 reports 2009 sample sizes, weighted household counts, and percentage frequencies by program and variance estimates. Standard errors reported in this article are Taylor series approximations that account for sample design and have finite population corrections.

The 2009 PUMS contains data on 237,689 households representing an estimated 4.7 million assisted households: 2.1 million in the HCVP, 1.1 million in PH, 1.4 million in PBS8, 113,828 in S202, and 30,574 in S811.

Exhibit 1

PUMS Program Frequencies

Program	Sample Size (N)	Weighted Households	Standard Deviation	Weighted Percent	Standard Error
Housing Choice Voucher Program	100,797	2,111,234	0.001	44.433	0.000
Public housing	61,687	1,137,413	0.002	23.938	0.000
Project-based Section 8	70,172	1,358,459	0.001	28.590	0.000
Section 202	3,955	113,828	0.000	2.396	0.000
Section 811	1,078	30,574	0.000	0.643	0.000
Total	237,689	4,751,508	0.003	100	

PUMS = Public Use Microdata Sample.

Source: U.S. Department of Housing and Urban Development Public Use Microdata Sample 2009

Data Sources

Household characteristics for households in PIH programs were extracted from HUD's Inventory Management System/PIH Information Center (IMS/PIC) data system (HUD, 2013a). Household characteristics for households in Office of Housing programs were extracted from HUD's Tenant Rental Assistance Certification System (TRACS) data system (HUD, 2013b).

Both IMS/PIC and TRACS are transaction based. The PUMS is based on the most recent certification transaction for each household at the end of the calendar year. For most households, the record is at most 18 months old. For PH and HCVP households assisted by housing agencies in the Moving to Work demonstration program (HUD, 2013c), the record is at most 3 years old.

Sample Design

The PUMS is a 5-percent sample, without replacement, of records for the 50 states, Washington, D.C., and Puerto Rico. The sample is stratified by state and program. The sample contains approximately 5 percent of records for each stratum.

The precise sample size for each stratum was determined by Neyman allocation, a statistical method giving a greater sample size for strata that have more diverse populations (Lohr, 1999). The standard deviation of adjusted household income was used as a proxy for diversity. The sample for each stratum is proportional to households multiplied by the standard deviation of adjusted household income.

The datasets contain a weight, which is the inverse of the sampling probability. The weight is the same for all households in a given stratum. Weighting makes the samples nationally representative.

Variables

The PUMS contains one variable to identify programs and two variables to identify states: state name and Federal Information Processing Standard, or FIPS, code. A variable also identifies strata.

The PUMS contains seven household-level variables. The household type variable reports household type in six categories. The number of household members is also reported, top-coded at 7. Number of bedrooms is reported, top-coded at 4. Household head sex is reported, along with a variable for household head race and ethnicity.

The 2009 PUMS reports annual household income measured in 13 categories. The first 12 categories report income in \$5,000 increments: \$0 to \$5,000, \$5,001 to \$10,000, ... \$55,001 to \$60,000. The 13th category is for households that have incomes between \$60,001 and \$90,000; income is top-coded at \$90,000.

Eligibility for HUD rental assistance programs is based on adjusted household income. Adjusted income is calculated by subtracting certain expenses from household income. Details of the calculation for PIH programs are reported on HUD form 50058 (HUD, 2013d) and on HUD form 50059 (HUD, 2013e) for Office of Housing programs. Annual adjusted household income is reported in the same categories as annual household income, and is also top-coded at \$90,000.

Rent burden is reported, which is defined as the household's contribution to gross rent (including utility costs) divided by monthly adjusted household income. Rent burden is undefined for households that have \$0 adjusted income. The 2009 PUMS reports rent burden in four categories: 0 to 31 percent, 32 to 39 percent, 40 to 49 percent, and 50 percent or more.

PUMS contains three geographic variables in addition to state: metropolitan status in three categories, an urban/rural indicator, and the poverty rate for the location's census tract in five categories.

Confidentiality

To ensure confidentiality, some PUMS variables were masked for some households. State is suppressed for households having unique combinations of variables in the population. If a household is uniquely identified after suppressing state, one or more additional variables are suppressed. For sampling purposes, households that have a suppressed state variable were treated as a separate state.

Comparison of PUMS With Other Data Sources

In this section, PUMS is compared with data available from other datasets: Picture of Subsidized Households and the American Housing Survey.

Picture of Subsidized Households

Picture of Subsidized Households (hereafter referred to as Picture; HUD, 2013f) reports a large amount of tabulated demographic² and geographic data on tenants in HUD rental assistance programs. Picture reports data on more programs than PUMS. Compared with PUMS, Picture also provides information at lower levels of geography (Core Based Statistical Area, county, city, and census tract). Picture information is also available by public housing agency for PIH programs and at the project level for projects in some programs.

Not all households have data reported in IMS/PIC and TRACS. Picture contains data for the entire population of assisted households reporting in IMS/PIC and TRACS, along with data on the percentage of housing units for which data are reported. By contrast, PUMS is limited to a 5-percent sample of reporting households.

Picture, however, does not allow for custom cross-tabulations. In the next section, a data analysis example is provided that uses PUMS data, which is not possible using Picture data.

American Housing Survey

Before 2011, the usefulness of the American Housing Survey (AHS; HUD, 2013g) for analyzing HUD-assisted household data was extremely limited due to (1) a very small sample size and (2) reporting errors in both the fact and type of assistance (Casey, 1992; HUD, 2008; Mast, 2012; Rucinski and Athey, 1996; Shroder, 2002). In addition, only two HUD programs were identified: PH and the HCVP.

In 2011, AHS began oversampling HUD-assisted households and verifying assistance status and program type. AHS now identifies households in three rental assistance categories: PH, the HCVP, and other “privately owned subsidized housing” (HUD, 2013h: 390), which can include housing subsidized by a variety of HUD multifamily rental assistance programs administered by the Office of Housing. PUMS and Picture identify specific HUD multifamily programs, but AHS does not.

Exhibit 2 reports AHS 2011-verified assistance status estimates by program. AHS 2011 contains data on 8,987 housing units that have verified assistance, representing an estimated 3.6 percent of total occupied housing units. The 2011 estimated counts of assisted households based on AHS data were 2.1 million HCVP households, 985,225 PH households, and 1.1 million households in multifamily programs.

Compared with PUMS, AHS contains much more demographic information for both people and households. AHS also contains a wealth of data on housing characteristics and neighborhood conditions not available in PUMS. The only geographic areas identified in AHS, however, are select metropolitan areas.

² PUMS contains one variable—rent burden—that is not contained in Picture. Although Picture reports mean household contribution to gross rent and mean adjusted household income, mean rent burden cannot be computed with these variables due to Jensen’s Inequality (the mean of $[X/Y]$ does not equal $\text{mean}[X]/\text{mean}[Y]$). Mean household contribution to gross rent divided by mean adjusted household monthly income can be used as an estimator of mean rent burden.

Exhibit 2**American Housing Survey Assisted Household Estimates**

Verified Rental Assistance Status	Sample Size (N)	Weighted Housing Units	Standard Deviation	Weighted Percent	Standard Error
Housing Choice Voucher Program	2,562	2,059,291	66,647	1.792	0.058
Public housing	2,303	985,225	44,415	0.857	0.039
Multifamily	4,122	1,127,739	41,004	0.981	0.036
Total subsidized	8987	4,172,255	89,526	3.631	0.077
Not subsidized	42,452	33,900,398	262,877	29.502	0.207
Not applicable (owner-occupied)	83,479	76,834,533	390,164	66.867	0.213
Total	134,918	114,907,187	428,882	100	

Source: American Housing Survey 2011

Data Analysis

This section provides a data analysis example using 2009 PUMS data that is not possible using Picture or AHS data. Rent burdens are compared across households in the HCVP, PH, and PBS8, making adjustments for differences in adjusted household income.

The S202 and S811 households are excluded from the analysis because some income categories in the 2009 PUMS contain no households in these programs, which would complicate the analysis. Suitable methods for comparisons, including these programs, are discussed at the end of this section.

Exhibit 3 reports weighted percentages of households by rent burden category and program, with standard errors. Households in the HCVP tend to have much higher burdens compared with those in PH and PBS8. In 2009, an estimated 31.5 percent of HCVP households had burdens greater than 31 percent. The corresponding estimates for PH and PBS8 are 3.1 and 9.0 percent, respectively. An estimated 13.6 percent of voucher families had burdens of at least 40 percent. By sharp contrast, 2.4 percent of PH households and 7.4 percent of PBS8 households were estimated to have burdens that were 40 percent or more.

High rent burdens may be a greater economic hardship for households that have relatively lower incomes. For policy purposes, it may be useful to compare rent burdens across programs after adjusting for income differences. This adjustment is made using Barskey et al.'s (2002) simple and powerful nonparametric propensity score weighting method.³

Exhibit 4 reports sample sizes and percentage frequencies for the 13 income categories by program. Compared with HCVP households, PH families were overrepresented in the upper income categories, but PBS8 families were underrepresented. An estimated 7.0 percent of voucher households had adjusted annual incomes of at least \$25,001 compared with an estimated 8.9 percent of PH households and an estimated 2.9 percent of PBS8 households.

³ Barskey et al.'s (2002) reweighting technique is similar to that of DiNardo, Fortin, and Lemieux (1996).

Exhibit 3

Rent Burden Percentage Frequencies by Program

Housing Choice Voucher Program

Rent Burden	N	Weighted Percent	Standard Error
0–31%	58,830	59.449	0.149
32–39%	18,588	17.895	0.119
40–49%	8,974	8.399	0.085
50% or more	5,446	5.159	0.068
Missing	8,959	9.097	0.087

Public Housing

Rent Burden	N	Weighted Percent	Standard Error	Income-Adjusted Percent	Standard Error
0–31%	53,679	85.253	0.148	88.093	0.118
32–39%	497	0.780	0.037	0.776	0.034
40–49%	450	0.690	0.034	0.701	0.032
50% or more	1,032	1.665	0.055	1.558	0.047
Missing	6,029	11.612	0.138	8.872	0.103

Project-Based Section 8

Rent Burden	N	Weighted Percent	Standard Error	Income-Adjusted Percent	Standard Error
0–31%	59,943	85.772	0.128	88.506	0.103
32–39%	1,295	1.594	0.045	1.506	0.040
40–49%	1,083	1.365	0.042	1.233	0.036
50% or more	4,111	5.994	0.089	4.596	0.067
Missing	3,740	5.275	0.084	4.160	0.065

Notes: Rent burden is defined as the family's contribution to gross rent, including utilities, divided by adjusted monthly income. Rent burden is missing for households with \$0 adjusted income.

Source: U.S. Department of Housing and Urban Development Public Use Microdata Sample 2009

For PH and PBS8 households in income category j , the proportion of voucher households in that category, p_j , can be used as a nonparametric estimate of the propensity score of having the same income as a voucher household. For instance, an estimated 15.8 percent of HCVP households had incomes between \$0 and \$5,000 in 2009. For the 20.2 percent of PH households and 19.9 percent of PBS8 households in the \$0-to-\$5,000 income category, 0.158 is used as an estimate of the probability that these households had the same income as a voucher household.

Each PH and PBS8 household falls in 1 income category, and the sum of possible propensity scores across categories equals 1. Thus the propensity scores specify an alternative probability mass function for the 13 possible income categories for PH or PBS8 households.

For propensity score weighting, an adjusted weight $w_{j,k}^*$ can be used equal to $p_j W_k / N_{j,k}$, where W_k is the total sum of original sampling weights for program k , and $N_{j,k}$ is the sample size in income category j for program k .

Exhibit 4 reports the propensity score weights by income category for PH and PBS8. For example, an estimated 22.6 percent of voucher households had adjusted incomes between \$10,001 and

Exhibit 4**Income Percentage Frequencies and Propensity Score Weights****Housing Choice Voucher Program**

Adjusted Annual Income (\$)	N	Weighted Percent (p)	Standard Error
0–5,000	15,188	15.827	0.113
5,001–10,000	34,535	35.638	0.150
10,001–15,000	22,950	22.610	0.130
15,001–20,000	13,133	12.478	0.101
20,001–25,000	7,047	6.486	0.074
25,001–30,000	3,772	3.400	0.054
30,001–35,000	2,000	1.757	0.038
35,001–40,000	1,089	0.919	0.027
40,001–45,000	542	0.452	0.019
45,001–50,000	264	0.212	0.013
50,001–55,000	139	0.111	0.009
55,001–60,000	51	0.040	0.005
60,001–90,000	87	0.069	0.007

Public Housing

Adjusted Annual Income (\$)	N	Weighted Percent	Standard Error	Propensity Score Weight (w*)
0–5,000	10,862	20.246	0.161	16.573
5,001–10,000	21,633	36.873	0.200	18.738
10,001–15,000	11,603	18.776	0.162	22.164
15,001–20,000	6,654	9.955	0.120	21.330
20,001–25,000	3,737	5.242	0.085	19.741
25,001–30,000	2,447	3.203	0.064	15.805
30,001–35,000	1,613	1.998	0.048	12.392
35,001–40,000	1,089	1.306	0.038	9.595
40,001–45,000	744	0.878	0.031	6.912
45,001–50,000	532	0.618	0.026	4.525
50,001–55,000	313	0.365	0.020	4.049
55,001–60,000	224	0.258	0.017	2.021
60,001–90,000	236	0.283	0.018	3.328

Project-Based Section 8

Adjusted Annual Income (\$)	N	Weighted Percent	Standard Error	Propensity Score Weight (w*)
0–5,000	14,230	19.936	0.146	15.109
5,001–10,000	26,390	39.671	0.185	18.345
10,001–15,000	16,389	23.839	0.161	18.741
15,001–20,000	7,471	9.940	0.109	22.689
20,001–25,000	3,015	3.686	0.066	29.223
25,001–30,000	1,433	1.623	0.042	32.233
30,001–35,000	650	0.703	0.027	36.728
35,001–40,000	298	0.311	0.018	41.877
40,001–45,000	157	0.159	0.012	39.119
45,001–50,000	70	0.067	0.008	41.071
50,001–55,000	35	0.033	0.005	43.252
55,001–60,000	14	0.013	0.003	38.614
60,001–90,000	20	0.018	0.004	46.898

Source: U.S. Department of Housing and Urban Development Public Use Microdata Sample 2009

\$15,000, PUMS contains 11,603 PH households in this category, and the total sum of weights for PH was 1,137,413 (exhibit 1). The propensity score weight for PH households in the \$10,001-to-\$15,000 income category is 0.226 times 1,137,413 divided by 11,603, which equals 22.2.

For both PH and PBS8, the total sum of propensity score weights equals the sum of original sampling weights. Weighting PH and PBS8 households by the propensity score weights, the percentage of PH and PBS8 households in each income category is identical to the HCVP percentage. The only differences in the income distributions across programs after propensity score weighting are due to differences within income categories.

Exhibit 3 reports income-adjusted percentages of PH and PBS8 households by rent burden category, with standard errors. Propensity score weighted estimates indicate that, when comparing households that have similar incomes, rent burden differences between the HCVP and the other two programs are even more pronounced.

In 2009, an estimated 59.5 percent of HCVP households had rent burdens of less than 32 percent. Before accounting for income differences, an estimated 85.3 percent of PH households had rent burdens of less than 32 percent, as did an estimated 85.8 percent of PBS8 households. After propensity score weighting, an estimated 88.1 percent of PH households and an estimated 88.5 percent of PBS8 households had rent burdens of less than 32 percent.

Not adjusting for income differences, the mean estimated difference in percentages of PH and HCVP households in the 0- to 31-percent rent burden category was 25.8 percentage points, with a 95-percent confidence interval of (25.4, 26.2). Adjusting for income differences, the mean estimated difference was 28.6 percentage points, with a 95-percent confidence interval of (28.3, 29.0).

Ignoring income differences, the mean estimated difference in percentages of PBS8 and HCVP households in the 0- to 31-percent rent burden category was 26.3 percentage points, with a 95-percent confidence interval of (25.9, 26.7). Matching on income, the mean estimated difference was 29.1 percentage points, with a 95-percent confidence interval of (28.7, 29.4).

No S202 and S811 households were in the 2009 PUMS sample for some income categories. To compare rent burdens in S202 households against rent burdens in the other programs, the propensity scores can be based on the proportion of S202 households in each income category, thereby giving households in the other programs zero weight for income categories with no S202 households. To adjust for the possibility that the S202 population contains households in more income categories than is reported in PUMS, a Bayesian method can be used to smooth the income distribution.

Conclusion

To promote government openness and transparency, in February 2012, the U.S. Department of Housing and Urban Development launched a new Public Use Microdata Sample, or PUMS, database, which contains household-level data for 5 percent of households that are assisted through the Housing Choice Voucher Program, public housing, Section 8 Project-Based Rental Assistance, the Section 202 program that subsidizes supportive housing for the elderly, and the Section 811 program that subsidizes supportive housing for people with disabilities.

PUMS includes household characteristics as well as geographic information, enabling researchers to perform analyses not possible using other datasets.

This article presented a data analysis example using PUMS data comparing rent burdens across programs, adjusting for income differences using Barskey et al.'s (2002) nonparametric technique. Before accounting for income differences, rent burdens are much higher in the voucher program compared with HUD's other rental assistance programs. Results indicate that when comparing households that have similar incomes, rent burdens of HCVP households are even higher compared with those of other assisted households.

Acknowledgments

The author thanks Dav Vandenbroucke for helpful comments.

Author

Brent D. Mast is a social science analyst at the U.S. Department of Housing and Urban Development, Office of Policy Development and Research, Program Monitoring and Research Division.

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Additional Reading

Mast, Brent D. Forthcoming. "Markov Chain Model of Rent Burden in the Housing Choice Voucher Program," *Journal of Housing Research*.

McClure, Kirk. 2005. "Rent Burden in the Housing Choice Voucher Program," *Cityscape: A Journal of Policy Development and Research* 8 (2): 5–20. Also available at <http://www.huduser.org/Periodicals/cityscape/vol8num2/ch1.html>.

Graphic Detail

Geographic Information Systems (GIS) organize and clarify the patterns of human activities on the Earth's surface and their interaction with each other. GIS data, in the form of maps, can quickly and powerfully convey relationships to policymakers and the public. This department of Cityscape includes maps that convey important housing or community development policy issues or solutions. If you have made such a map and are willing to share it in a future issue of Cityscape, please contact ronald.e.wilson@hud.gov.

Tracking Criminals With Cell Tower Analysis

Toni Nunez

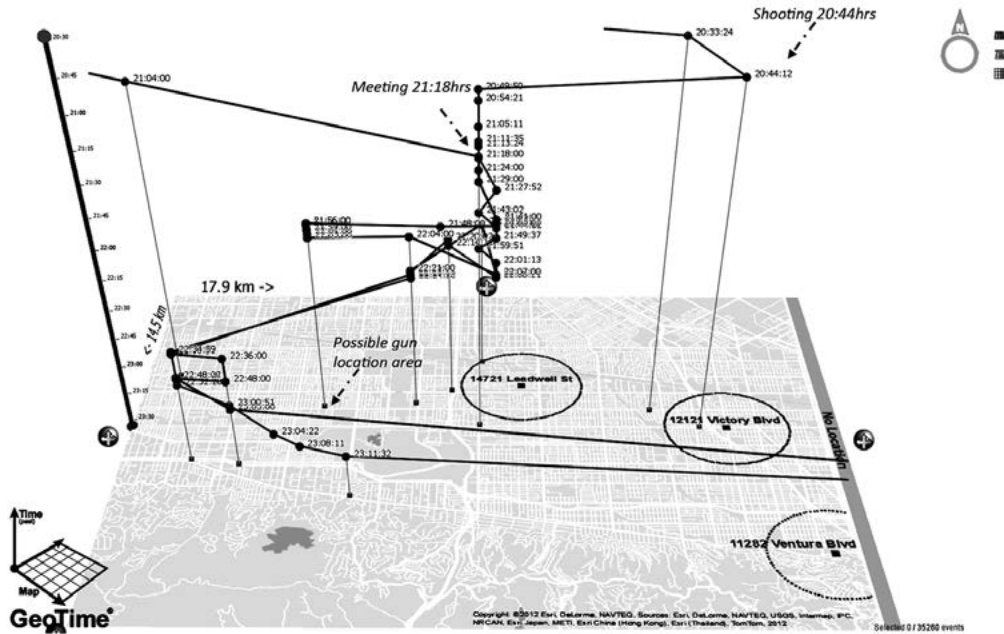
Los Angeles Clearinghouse

Detectives investigating a homicide case wanted to corroborate a witness's statements that the suspect handed off the murder weapon to an associate sometime after the shooting. They wanted to primarily confirm (1) who that associate was and (2) where the associate traveled after the meeting so an attempt could be made to recover the gun. Using GeoTime 5.5 and ArcMap 10.1, we developed a 3-D (three-dimensional) GeoTime map that enabled us to see the direction of travel of the two cell phones, when and approximately where they met, and where they each traveled following the meeting. We can suggest the two cell phones are "meeting" when they are hitting towers within 500 meters and 5 minutes of each other (see exhibit 1). A 2-D map does not enable us to visualize travel and time in this 3-D fashion.

We see the Suspect #1 cell phone hitting a tower near the homicide location about the time of the shooting, 20:44hrs. The Suspect #1 cell phone "meets" with Associate #1 at 21:18hrs. The two cell phones separate and Associate #1 tower hits indicate possible drop areas for the murder weapon.

Exhibit 1

3-D Map Showing the Area Where Suspect #1 Met Associate #1 To Hand Off the Murder Weapon



Legend

- Suspect #1 cell tower hits
- Associate #1 cell tower hits
- 14721 Leadwell St
- 12121 Victory Blvd
- 11282 Ventura Blvd
- 1-mile radius 14721 Leadwell
- 1-mile radius 12121 Victory
- 1-mile radius 11282 Ventura

Data source: AT&T Wireless

Map source: Canvas/World Light Gray retrieved from www.arcgis.com

Acknowledgments

The author thanks Curtis Garton, product manager, and the entire GeoTime Team at Oculus Info Inc.

Author

Toni Nunez is a senior lead analyst at the Los Angeles Clearinghouse, an intelligence node of the Los Angeles High Intensity Drug Trafficking Area.

Exploring Housing Cost Data With Conditioned Choropleth Maps

Brent D. Mast

U.S. Department of Housing and Urban Development

The views expressed in this article are those of the author and do not represent the official positions or policies of the Office of Policy Development and Research or the U.S. Department of Housing and Urban Development.

Micromaps (for example, see Carr and Pickle, 2010) display multiple maps on the same exhibit, with different geographic units highlighted in each map. A conditioned choropleth map (CCM) is a type of micromap with multiple maps arranged in a panel layout conditional on one or two categorical variables, with highlighted regions shaded according to a main variable of interest. CCMs have been used in a wide variety of applications (for example, see Carr and Pickle, 2010; Carr, Wallin, and Carr, 2000; Carr, White, and MacEachren, 2005; Friendly, 2007).

In this article, I demonstrate how to use CCMs to explore variation in housing cost-to-income ratios (HCIRs) in the 50 states and Washington, D.C. For renters, HCIR equals monthly rent plus utility and fuel costs, divided by monthly household income. For homeowners, monthly costs can include mortgage payments, property insurance, property taxes, utility and fuel costs, condominium fees, and mobile home fees, in addition to other costs.

I analyze the association of HCIRs with two other variables: percentage of the population in urban areas (hereafter, percent urban) and married couple households as a percentage of total households (hereafter, percent married). Data on HCIRs and percent married are from the American Community Survey (ACS) Public Use Microdata Sample (PUMS) for 2007 through 2011 (Ruggles et al., 2010);¹ data on percent urban are from the 2010 census.

State HCIR estimates vary from 23.8 percent in West Virginia to 36.9 percent in Washington, D.C., with a median of 29.5 percent in North Carolina and a mean of 29.9 percent. State percent urban estimates vary from 33.0 percent in Vermont to 100 percent in Washington, D.C., with a median of 73.1 percent in Virginia and a mean of 72.5 percent. State estimates of percent married vary from 19.3 percent in Washington, D.C., to 58.5 percent in Utah, with a median of 46.5 percent in Michigan and a mean of 46.1 percent.

¹ The ACS PUMS does not identify married same-sex couples. As such, married couple data in this study are for married opposite-sex couples.

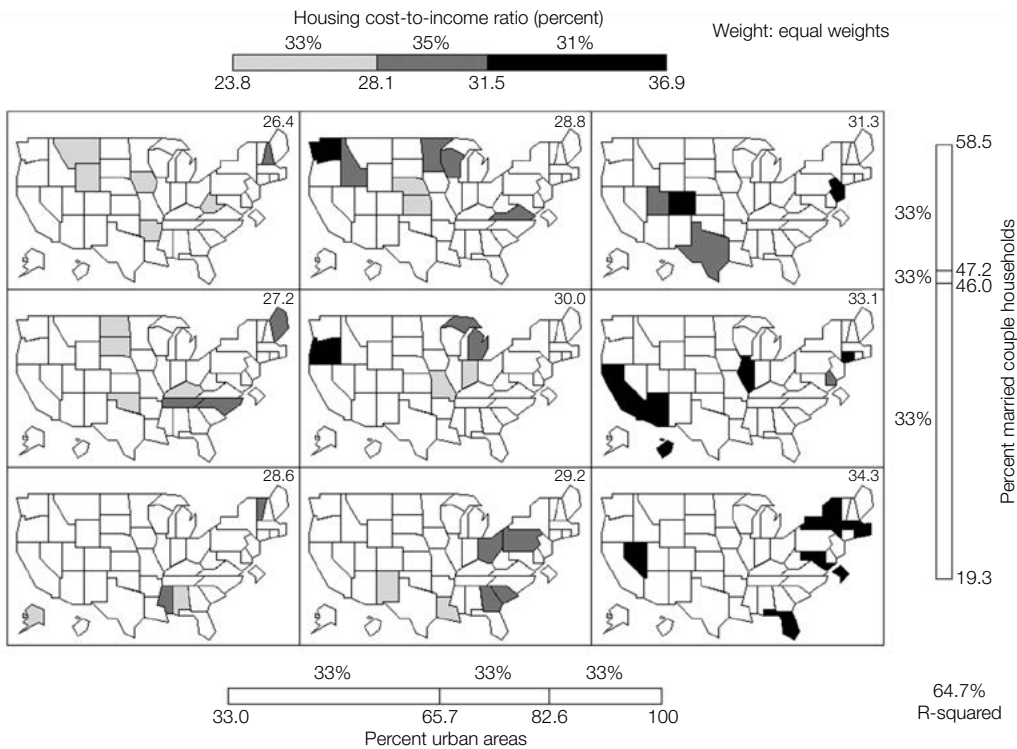
When computing means and percentiles, we could weight geographic units by population or number of households. For this article, I gave all observations equal weight.

Exhibit 1 displays a CCM² mapping HCIRs conditional on percent urban and percent married. Exhibit 1 displays nine micromaps in a three-by-three panel layout. Panel columns correspond to three categories of percent urban, indicated by the bottom horizontal slider, and rows correspond to three categories of percent married, indicated by the right vertical slider.

HCIRs in exhibit 1 are shaded according to three categories indicated by the horizontal slider at the top of exhibit. Cut points in exhibit 1 for all three variables are roughly the 33rd and 66th

Exhibit 1

Housing Cost-to-Income Ratios Conditional on Percent Urban Areas and Percent Married Couple Households



Note: Cut points are reported below the top and bottom sliders and to the right of the vertical slider. Percentages of observations in the categories are reported above the top and bottom sliders and to the left of the vertical slider. Mean housing cost-to-income ratios are reported in the upper right-hand corner of each panel. The R-squared reported is for a two-way analysis of variance of housing cost-to-income ratios with the percent urban areas and percent married couple households categorical variables.

Sources: American Community Survey 2007–2011 Public Use Microdata Sample (housing cost-to-income ratios and married couple households as a percentage of total households); 2010 census (percentage of the population in urban areas)

² The CCMs in the article were produced with Carr et al.'s CCmaps software. <http://mason.gmu.edu/~dcarr/>. CCMs can also be produced by Bivand et al.'s mapproj R package. <http://www.cran.r-project.org/web/packages/mapproj/index.html>.

percentiles. Cut points are reported below the top and bottom sliders, and to the right of the vertical slider. Percentages of observations in the categories are reported above the top and bottom sliders, and to the left of the vertical slider. For each variable, I will refer to the lowest category as “low,” the middle category as “medium,” and the highest category as “high.” In exhibit 1, the 33 percent of observations in the low HCIR category with HCIRs between 23.8 and 28.1 percent are shaded light gray; the 35 percent of observations with medium HCIRs from 28.2 to 31.5 percent are shaded medium gray; and the 31 percent of observations with high HCIRs from 31.6 to 36.9 percent are shaded black.

In exhibit 1, the low percent urban category includes states with percent urban estimates between 33.0 and 65.7 percent; the medium percent urban category is for states with estimates between 65.8 and 82.6 percent; and the high percent urban category includes states with estimates from 82.7 to 100 percent. Likewise, in exhibit 1, the low percent married category includes states with estimates between 19.3 and 46.0 percent; the medium percent married category includes states with estimates between 46.1 and 47.2 percent; and the high percent married category is for states with estimates between 47.3 and 58.5 percent.

Exhibit 1 indicates that HCIRs are positively related with percent urban and negatively related with percent married. In the upper left panel, states with low percent urban and high percent married are highlighted. The upper left panel includes five states with low HCIRs shaded light gray (Arkansas, Iowa, Montana, West Virginia, and Wyoming) and one state with a medium HCIR shaded medium gray (New Hampshire). The mean HCIR for highlighted states is reported in the upper right corner of each panel. The mean HCIR of the six highlighted states in the upper left panel is 26.4 percent, which is the lowest among the nine panel means.

In the lower right panel in exhibit 1, states with high percent urban and low percent married are highlighted. In the lower right panel, Washington, D.C. and all five states (Florida, Maryland, Massachusetts, Nevada, and New York) are shaded black, indicating high HCIRs. The mean HCIR of the six highlighted observations in the lower right panel is 34.3 percent, which is the highest among all panel means.

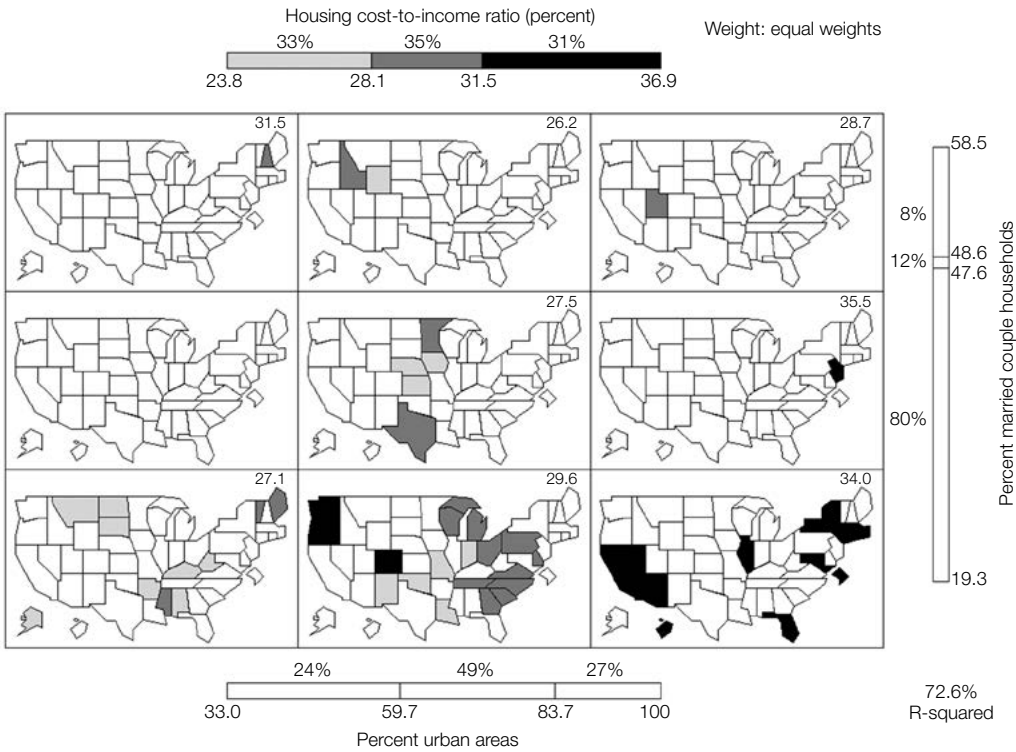
The R-squared from a two-way analysis of variance is reported in the lower right corner of exhibit 1. The R-squared equals 64.7 percent, indicating that the percent urban and percent married categorical variables explain 64.7 percent of the variation in HCIRs.

If we change the cut points used to define the percent urban and percent married categories, we will obtain a different R-squared. Exhibit 2 reports a CCM using 59.7 and 83.7 percent as cut points for the percent urban categories and 47.6 and 48.6 percent as cut points for the percent married categories; these cut points were chosen to approximately maximize the R-squared. The R-squared reported in exhibit 2 is 72.6 percent, which is considerably higher than the R-squared of 64.7 percent reported in exhibit 1.

The CCM is a powerful tool for visualizing and analyzing geographic data. In this article, CCMs clearly demonstrate that much of the variation in state HCIRs can be explained by variation in the percentage of the population living in urban areas and the percentage of households that are married couple households.

Exhibit 2

Housing Cost-to-Income Ratios Conditional on Percent Urban Areas and Percent Married Couple Households: Maximum R-Squared



Note: Cut points are reported below the top and bottom sliders and to the right of the vertical slider. Percentages of observations in the categories are reported above the top and bottom sliders and to the left of the vertical slider. Mean housing cost-to-income ratios are reported in the upper right-hand corner of each panel. The R-squared reported is for a two-way analysis of variance of housing cost-to-income ratios with the percent urban areas and percent married couple households categorical variables.

Sources: American Community Survey 2007–2011 Public Use Microdata Sample (housing cost-to-income ratios and married couple households as a percentage of total households); 2010 census (percentage of the population in urban areas)

Acknowledgments

The author thanks Ron Wilson for helpful comments and thanks Daniel Carr for helpful suggestions for using his CCmaps software.

Author

Brent D. Mast is a social science analyst at the U.S. Department of Housing and Urban Development, Office of Policy Development and Research, Program Monitoring and Research Division.

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Impact

A regulatory impact analysis must accompany every economically significant federal rule or regulation. The Office of Policy Development and Research performs this analysis for all U.S. Department of Housing and Urban Development rules. An impact analysis is a forecast of the annual benefits and costs accruing to all parties, including the taxpayers, from a given regulation. Modeling these benefits and costs involves use of past research findings, application of economic principles, empirical investigation, and professional judgment.

The Proposed Affirmatively Furthering Fair Housing Regulatory Impact Analysis

Raphael Bostic

University of Southern California

Alastair McFarlane

U.S. Department of Housing and Urban Development

The views expressed in this article are those of the author and do not represent the official positions or policies of the Office of Policy Development and Research or the U.S. Department of Housing and Urban Development.

Summary of Analysis

The Fair Housing Act prohibits discrimination and directs the U.S. Department of Housing and Urban Development (HUD) to promote steps to overcome historic patterns of segregation, fair housing choice, and inclusive communities. The proposed Affirmatively Furthering Fair Housing (AFFH) rule would help address the legacy of segregation and locational choice factors influenced by race, color, religion, sex, familial status, national origin, disability, and other protected classes, that typically do not rise to the level of discriminatory actions that violate other sections of the Fair Housing Act.

AFFH proposes a planning process to give HUD program participants more effective means to affirmatively further the purpose of the Fair Housing Act. AFFH requires steps to foster more inclusive communities and access to community assets for all people protected by the Fair Housing Act. HUD would provide states, local governments, public housing agencies (PHAs), and communities with local and regional data on patterns of (1) integration; (2) racially and ethnically concentrated

areas of poverty; (3) access to education, employment, low-poverty neighborhoods, transportation, environmental health, and so on; and (4) disproportionate housing needs of protected classes. From these data, grantees would assess the current state of fair housing in their community, identify the primary determinants of the issues revealed in the data, set forth priorities to address these issues, and document these activities in an Assessment of Fair Housing (AFH) report. The rule also proposes new HUD procedures to evaluate grantees' fulfillment of their obligation to affirmatively further fair housing.

The proposed rule may increase some program participants' compliance costs but reduce others as HUD assumes data provision duties. Implementing the proposed rule would require HUD staff to review and approve the AFH reports and assist program participants.

The proposed rule has several key benefits. First, it clarifies fair housing goals, which will help focus program participants' attention and decisionmaking. Second, HUD's provision of key data to identify fair housing issues, understand their drivers, and establish priorities will reduce the cost to local governments, increase analytical rigor, and encourage broad-based engagement. Third, the proposed rule creates more explicit linkages between this process and subsequent planning activities, thereby increasing program participants' attention to fair housing issues as they plan and allocate resources. Fourth, the proposed rule does not prescribe, obligate, or enforce local government pursuit of specific fair housing policies. Taken together, these benefits can improve fair housing outcomes and the welfare of the protected classes.

The rule covers program participants subject to a diversity of local preferences and economic and social contexts. Therefore, significant uncertainty is associated with quantifying the outcomes of the proposed process to identify (1) barriers to fair housing, (2) program participants' decisions on which barriers to address, (3) the types of policies to address those barriers, and (3) those policies' effects on protected classes. The precise outcomes of the proposed AFFH planning process are uncertain, but the rule will enable each jurisdiction to plan meaningfully.

Need for the Rule

A Government Accountability Office analysis of 30 Analyses of Impediments (AIs) highlighted the most common impediments to fair housing choice: zoning and site selection, inadequate public services in low- and moderate-income areas, less favorable mortgage terms from private lenders, and lack of access to information about fair housing rights and responsibilities (GAO, 2010). The existence of these barriers is costly, and the proposed rule would improve the current planning process to overcome them.

Barriers That Prevent Mobility

Market and regulatory barriers hamper families in segregated neighborhoods, racially concentrated areas of poverty, and locations that limit access to community assets from trying to move to locations where these issues are less acute. Potential barriers in target areas to protected classes' entry include a lack of affordable housing, inability to use existing housing subsidies, a lack of awareness about housing options, and a lack of supports such as childcare.

In some instances, government policies and practices have not aggressively promoted integration, eliminating racially concentrated poverty, and reducing disparities in access to community assets. One historical example is the race-based restriction on Federal Housing Administration activities in the 1940s. A second and more contemporary example is evidence that HUD-assisted housing is often concentrated in segregated, high-poverty areas.

Housing discrimination is not the primary focus of this rule, but it could limit housing choice and perpetuate the existence of segregation, racially concentrated poverty, and disparities in access to community assets. Restricted choice during the search process leads minorities to achieve less than the optimal housing outcome,¹ likely causing them to pay more for similar quality housing.² The premium could manifest in the rent, purchase price, or mortgage loan terms.³ The indirect implication of that premium is that a member of a protected class will not have equal access to the same locations as others. Thus, any public policy that responds to discrimination and its historical legacy could create significant social benefits in housing consumption and the choice of neighborhood.

The academic literature identifies additional costs to restricted housing choice, including reduced employment, education, and homeownership opportunities and reduced benefits from living in a safer and healthier environment. For example, Card and Rothstein (2007) studied educational outcomes and, controlling for student background, found that residential segregation during high school is associated with lower African-American test scores relative to Whites. Other evidence suggests that fair housing policy improves an entire metropolitan area's economic welfare. Cutler and Glaeser (1997) analyzed the metropolitanwide impacts of segregation and found that a 1-standard-deviation decrease in segregation explains one-third of the African-American-to-White difference in measured outcomes (schooling, earnings, and single parenthood).⁴ The authors concluded that housing policy that reduces spatial segregation could be as effective as education, labor, or social policies in achieving equal outcomes.⁵ We know that segregation exists, is often involuntary, and has malicious impacts that local policy can help ameliorate.

Barriers That Prevent a Broader Appeal

Barriers that inhibit community improvements are as costly as barriers that prevent people from settling in their preferred community. More families are drawn to neighborhoods with particular

¹ The most recent (2012) Housing Discrimination Study, based on 8,200 paired tests, found that housing discrimination exists but has decreased significantly in most forms since the first study, in 1977. Hanson and Hawley (2011), using matched-pair audits of discrimination in the U.S. rental market, found that discrimination against African Americans increases as neighborhoods reach a "tipping point" (from 5 to 20 percent minority share).

² Myers (2004) found a positive and statistically significant relationship between race and the value of owner-occupied housing. The finding is powerful because the researcher carefully controlled for structure and neighborhood characteristics. The same study, however, did not find that minorities pay a premium in the rental market, which Myers attributed to either the absence of discrimination in the rental market or the use of rental subsidies.

³ Woodward (2008) provided evidence that African Americans pay \$415 more and Hispanics pay \$365 more (after accounting for borrowers' differences, such as credit score and loan amount) for their mortgage loans than Whites do.

⁴ The authors' theoretical analysis was ambiguous concerning the net impact of segregation. The statistical analysis is statistically rigorous and controls for endogeneity of location choice by individual households. Durlauf (2004) pointed out, however, that underlying discrimination may be the root cause of both spatial segregation and worse outcomes.

⁵ Ananat (2011) controlled for omitted variable bias and confirmed Cutler and Glaeser's result: segregation is correlated with more African-American poverty and less White poverty.

assets, and the lack of these assets can limit the number of families who will consider living in a particular place. These assets include good schools, safe streets, access to good jobs, a good health infrastructure, available services such as childcare, parks and open space, diverse and healthy food choices, and a range of transportation options (including accommodations for disabilities). In each case, the absence or reduction of the asset hinders effective transformation of segregated neighborhoods.

As an alternative, increasing a neighborhood's appeal to families with different income and ethnic profiles can encourage a more diversified population and reduce isolation, thus advancing fair housing goals. A key challenge in transforming neighborhoods and promoting integrated communities is preserving their affordability and highlighting their appeal without radically changing their character. Transformation, particularly of lower income neighborhoods, can induce gentrification, which can help advance fair housing goals and integration, but it can also change the ethnic mix to the extent that the minorities who originally populated the neighborhood are no longer present. Such tipping is not a desired outcome of fair housing, because displacement can negate any progress.

Potential To Improve Existing Process

The traditional means of fair housing planning are not as effective as they could be. In the past, HUD did not require review of grantees' assessments, failed to specify or provide grantees relevant information, and did not clearly link grantees' assessments to community planning efforts, such as the consolidated plan and the PHA Plan. Recipients of HUD grants would benefit from tools to understand patterns of segregation, disparities in access to community assets, and protected classes' disproportionate housing needs to help them better develop strategies and actions to address these fair housing concerns.

GAO (2010: 32) affirmed the need to revise the current planning process to "better ensure that grantees' AIs serve as an effective tool for grantees to identify and address impediments to fair housing." The report recommended establishing rigorous standards for submission, checking, and verification of AIs, and it recommended measuring grantees' progress in addressing fair housing impediments.

Economic Impact of the Rule: Execution of the Process

The rule's impacts on program participants are associated with executing the envisioned planning process. HUD does not expect compliance cost to change much as a result of the rule. Some elements of the rule would increase compliance costs, and others would decrease them.

Costs to Program Participants

The new regulation envisions a process incorporated into the Consolidated Plan and the PHA planning process, building on what is already familiar to HUD's program participants, thus reducing burden and integrating disparate processes. HUD anticipates only marginal impact of this rule on document preparation time. States, local governments, and PHAs are already required to prepare written AFFH plans, undertake activities to overcome barriers to fair housing choice, and maintain records of the activities and their impact. The principal differences in the proposed rule are (1) program participants

would submit the plan to HUD for review and feedback, (2) the contents of the plan would be more precisely defined, (3) HUD would provide data for further analysis, and (4) a community participation process would be more precisely defined. States, local governments, and PHAs would not have to establish wholly new procedures, and because HUD will provide uniform data and clear expectations about AFFH requirements, the burden of developing the data for, and implementing, AFH as the successor to AI should decrease.

We expect new costs from extending community participation and consultation, for example, but also reduced costs from HUD providing data and the guidance tool. Additional costs may result as program participants become familiar with the proposed web-based data interface. The net change in burden for specific local entities would depend on the extent to which comply with the existing planning process. The local entities diligent in completing rigorous AIs will likely experience a net decrease in administrative burden under the revised process. The demands of the new process may, however, increase the administrative burden for those entities that do not conduct regular and careful AIs.

Examining the current costs of completing an AI provides insight as to the potential scale of cost changes under the proposed rule. An informal HUD survey of its program participants on the costs of performing an AI found that most respondents paid consultants to prepare the AI. The average total expenditure across the identified governments is \$40,000 (in 2011 dollars). The program has approximately 4,200 participants (1,100 entitlement jurisdictions and 3,100 PHAs). An AFH is required once every 5 years. On average, 840 program participants produce an AFH each year (4,200/5). Assuming a 10-percent cost increase, the aggregate annual compliance cost would be approximately \$3.4 million (10 percent x \$40,000 x 840).

Costs to the Federal Government

The regulation would additionally burden HUD staff, who would review and approve the AFH, help program participants identify and analyze drivers of fair housing choice disparity, and help develop strategies to overcome such disparity. Increased upfront review activity would likely comprise much of the additional effort on the part of HUD staff but, HUD believes, be balanced by reduced back-end review, compliance, and enforcement costs. A single case, such as Westchester County, can occupy significant staff time, let alone court resources.⁶ If net effort does increase at the federal level, however, much of it can be viewed as a transfer from the staffs of states, local governments, and PHAs.

Economic Impact of the Rule: Potential Community Benefits

Any changed decisions induced by the broader information set under the AFFH represent the community impact. The goal of the proposed rule is to improve fair housing outcomes and thus the welfare of protected classes through better information, clearer AFH formulation standards, and improved accountability. How a jurisdiction would use the information, what decisions it would reach, and how those decisions would affect the protected classes are difficult to predict,

⁶ For a recent review of the Westchester case, see Applebome (2012).

however. Although the proposed rule is intended to ensure that program participants, when allocating resources and making policy decisions, fully consider the challenges the protected classes face, the proposed rule does not mandate any policy decision or offer incentives to pursue fair housing policy. Given competing priorities and resource constraints, additional information might not change decisions in some instances. The AFFH process is only one factor that determines what actions are pursued and what impacts are ultimately achieved. At every step in this process, the magnitude and types of the proposal's effects are uncertain. The additional information might, however, cause decisionmakers to pursue different policies and actions.

Uncertainty in Jurisdictional Preferences

The effect of the rule on a jurisdiction's policy would depend first on whether the jurisdiction is favorably predisposed to fair housing policy and the character of the local bureaucracy, which raises the question of how such local preferences and structures are established.⁷ Many households' wealth consists largely of the asset value of a home, of which the quality of public services and taxes determine a portion. Because the median voter in many jurisdictions is a homeowner, issues related to house values and property taxes have prominence (Fischel, 2005). Homeowners might respond to new development according to its effect on their tax rates. Similarly, regulatory barriers increase housing prices by reducing housing supply.⁸ Homeowners might be inclined to pursue "fiscal zoning" policies, such as regulations on new construction, that exclude households. Inclusive policies may face resistance from established homeowners; Boustan (2012) found that court-ordered desegregation of public schools led to a 6-percent decline of housing prices relative to neighboring suburbs. If the median voter is a homeowner, and if that homeowner places greater attachment to house values than to fair housing, residents would collectively vote against a government that aggressively pursued desegregation, even if many homeowners believed that desegregation was a just policy.

Public opinion polls indicate that many factors drive resident and, by extension, jurisdictional preferences, including land values, property taxes, and religious, environmental, social justice, libertarian, international, and economic considerations. Such tensions and tradeoffs are not uncommon, and outcomes will vary across communities according to the specific way these considerations interact. Predicting how these factors interact to produce jurisdictional preferences is fraught with uncertainty.

Uncertainty in Prioritization

Whether the information that emerges from the AFFH will change a jurisdiction's priorities is also uncertain. For example, several jurisdictions (for example, Austin, Texas; Berkeley, California; Cambridge, Massachusetts; Minneapolis, Minnesota; and Montgomery County and Takoma Park, Maryland) have aggressively pursued policies to advance civil rights and fair housing objectives. In such places, HUD's information might not be new and the program may have relatively little effect on goal setting or policies pursued.

⁷ The Regulatory Impact Analysis of the proposed rule summarizes Wildasin's (1987) review of the public choice literature.

⁸ For a review of the inflationary impact of regulations on property prices, see Pollakowski and Wachter (1990) and Quigley and Rosenthal (2005).

As an alternative, where the information is new, several possibilities remain. The new information might confirm a widely held belief in a locality, in which case the resultant goals might not differ. The new information could, however, highlight relationships that were previously not well understood. In even this case, the new relationships could be deemed minor relative to previously existing priorities, in which case no change in goals or strategizing would be expected.

The new information might also shed light on an issue that had not previously been emphasized but that the AFH process makes clear is important. This process could highlight additional goals or supplant some goals with new ones that could be of either primary or secondary significance from a strategic perspective.

Uncertainty in Policy Decisions

Even if we knew that the proposed rule would change local priorities, the exact policy choices that jurisdiction will make remain difficult to predict. The current Fair Housing Planning Guide (HUD FHEO, 1996) offers hundreds of pages detailing policies and practices to advance fair housing objectives. Many policy options address each particular concern. Consider integration. One approach might confront the forces that cause segregation, such as housing discrimination, lending discrimination, predatory lending, insurance redlining, weak enforcement of antidiscrimination laws, regulatory barriers, and “NIMBYism.”⁹ Other approaches involve improving access to neighborhoods or public services through housing mobility programs, housing counseling, inclusionary zoning (IZ), siting public and assisted housing, a more equitable distribution of public services, and accessible housing.

The proposed rule would not prescribe or enforce specific local policies but rather allow for a flexible approach appropriate to the need, housing market conditions, and available resources. A jurisdiction’s choice from among the various policy options will depend fundamentally on the local context and the prevailing circumstances when the issues are considered.

Moreover, a policy appropriate for one jurisdiction may be inappropriate for another, depending on the built environment, spatial distribution and characteristics of the population, prevalence of discriminatory practices, and prevailing local economic conditions. Thus, even for jurisdictions that face the same set of fair housing challenges, even assuming agreement on the set of policies to consider, determining the likelihood that a particular policy would be implemented is daunting, if not impossible.

HUD’s past experience with planning exercises demonstrates the inherent uncertainties. In 1990, the National Affordable Housing Act required state and local governments to prepare a Comprehensive Housing Affordability Strategy (CHAS) to receive selected federal housing assistance funds (for example, the Community Development Block Grant and the HOME program). The statute and HUD’s accompanying rule required identifying housing needs, setting priorities and strategies, and 5-year action plans. Hoben and Richardson (1992) found that the available data identified needs that did not always correspond with proposed actions. For example, only 40 percent of the

⁹ *NIMBYism* refers to actions by neighborhood residents to prevent new policies or programs from being sited in that neighborhood. NIMBY stands for “not in my backyard.”

jurisdictions examined found a need to assist first-time homebuyers, but 70 percent selected first-time homebuyers for priority assistance. Thus, one source of uncertainty is that identified needs may not map to adopted priorities.

A jurisdiction's conclusions are also inherently subjective. The primary author, whether a local city planner, an economic consultant, or a fair housing advocate, may interpret the same data differently.

Uncertainty in Welfare Outcomes

A further degree of uncertainty, best illustrated via an example, involves potential impacts of whichever policy a jurisdiction selects. Consider IZ, a policy under which developers of certain types of properties are required to allocate a proportion of their development activity to "affordable" housing, often in return for zoning waivers and other development incentives. Studies of IZ make clear that its impact and effectiveness are uncertain; the policy might not result in new affordable units, particularly in the longer term, depending on market conditions and local circumstances (McFarlane, 2009; Schuetz, Meltzer, and Been, 2007). Adding affordable units does not guarantee that fair housing goals will advance. Indeed, these affordable units will be available to any eligible resident, so families whose presence would not further fair housing goals, such as reducing segregation, could occupy many new affordable IZ units.

The impact ultimately depends on the complex interaction of judgments and decisions by the jurisdiction, other jurisdictions, private and nonprofit actors, and families in protected classes and not. In the preceding example, the jurisdiction could enhance the likelihood that the new IZ units helped advance fair housing goals by also introducing other policies, such as affirmative marketing. These interactions would differ in every jurisdiction, making impact predictions for a single policy choice difficult, especially given the many policies that a jurisdiction could pursue.

Demonstration of Potential Effects

The uncertainty makes predicting the proposed rule's influence on local planning policy; the subsequent change in the spatial distribution of housing, people, and businesses; and the resulting economic effects extremely difficult. These realities suggest considering examples of potential impacts if the information from the proposed process leads jurisdictions to make different decisions and actions than under the current process. Four categories of actions emerge: (1) modifying local regulations and codes, (2) constructing new developments, (3) creating new assets, and (4) moving people.¹⁰

Modifying Local Regulations and Codes

Local regulations and codes can be an important lever for advancing fair housing objectives. In thinking about how the information from the proposed AFH might change local program participants' decisions and actions, consider people with disabilities. In the proposed process, HUD will

¹⁰ The Regulatory Impact Analysis provides examples of how the new information from the proposed process might impact decisions and actions to provide a flavor of the potential mechanisms at play and allow for some assessment of the types of potential impacts.

provide program participants with more systematic information on the geographic distribution of disabled populations. Suppose that a jurisdiction's dissimilarity index for people with disabilities suggests relative segregation, and a review of HUD maps reveals that disabled people are concentrated in a few neighborhoods. This information could increase local decisionmakers' awareness of challenges that disabled populations face. Additional research could indicate that a lack of accessible housing in particular neighborhoods contributes to the observed segregation of disabled populations. Given such information, the jurisdiction might change the building code to maximize accessibility, perhaps by requiring that a fixed percentage of first-floor units adhere to Interstate Commerce Commission/American National Standards Institute guidelines. As an alternative, the jurisdiction could change the zoning code to provide density bonuses for proposed projects in neighborhoods where people with disabilities have limited representation if the project includes more Americans with Disabilities Act-compliant units than some threshold.

Both of these actions would be expected to make more units attractive to people with disabilities, presumably increasing applications from households including people with disabilities. Were these applications successful, more people with disabilities would live in neighborhoods where they were previously underrepresented.

Although the new units would clearly benefit the disabled households that occupied them, the new codes and regulations would have other potential impacts. Such regulations generally impact market outcomes and raise prices (Glaeser and Gyourko, 2002; Pollakowski and Wachter, 1990; Quigley and Raphael, 2005). In the context of the preceding example, people with disabilities might even pay more in the new neighborhoods that are regulated to their benefit. Many observers argue that reducing regulation is the best way to encourage the construction of affordable housing (Glaeser and Gyourko, 2002). On balance, local governments must weigh how regulations impact the cost and quantity of housing supplied when deciding how to modify local regulations and codes. Costs, benefits, and significant transfers are involved. An AFH would identify barriers to access that arise from zoning policy.

Constructing New Developments

Neighborhoods may lack housing affordable to many people in protected classes, or the existing housing might not accommodate the needs of households in protected classes. For example, Hispanic families are on average larger than other American families and so need units with more bedrooms. If the existing housing stock does not include many units with more bedrooms, then Hispanic families have fewer choices of where to live, and some neighborhoods are effectively out of reach. As a consequence, policies and actions associated with building housing are of particular interest where fair housing is concerned.

In considering the role that the new information from the proposed process might play in this context, we turn again to IZ. Many IZ programs are voluntary or allow for significant exemptions, and most offer developer incentives to compensate for the anticipated revenue reduction. A common incentive, the density bonus, enables developers to build beyond the applicable density ceiling.

Under the proposed rule, as program participants assess fair housing and use the HUD data, suppose the education data indicate that the average Hispanic household lives in neighborhoods

served by schools where test scores are significantly lower than at schools serving the neighborhoods where the average White household lives. Suppose that further analysis shows that this disparity is because of a lack of affordable housing in the neighborhoods with better schools. The current process, which gives program participants less guidance through a fair housing assessment, might not uncover this conclusion. In the face of this new information, local policymakers might opt to establish development zones covering neighborhoods in which IZ rules apply to increase the availability of affordable units in the targeted areas.

The mere existence of additional affordable units does advance fair housing goals, because these units will be available to any eligible resident. Continuing with the preceding example, non-Hispanic families could occupy many of the affordable IZ units produced. Other policies, such as affirmative marketing, could mitigate this impact to some extent, but the point remains the same. Identifying the ultimate change in outcomes is difficult because of the many determining factors involved. One potential cost of IZ to a community would be the reduced supply of market-rate housing and corresponding increase in average housing costs. The benefits would consist primarily of transfers to the residents of IZ housing.

Creating New Assets

The quality of public services varies dramatically among residential neighborhoods. Access to neighborhood assets that enhance low-income households' quality of life and opportunities are important elements in the welfare of protected classes. Improved street lighting and access to a dense transportation network are two examples of neighborhood assets provided by a local government. Under the proposed rule, the AFH might suggest that a particular fair housing issue has been driven by the absence of these public goods.

For example, African Americans' lower employment index values might suggest that they lack access to important job centers. Further analysis might suggest that the lack of effective transit is an important determinant of the observed disparities. Policymakers could consider several different approaches. They could work with transit officials to adjust bus routes so more stops were closer to concentrations of African Americans. As an alternative, they could introduce a new express bus rapid transit line linking targeted neighborhoods with job centers throughout the region.

Regarding general economic impacts, increasing local of assets will lead to increasing demand for housing in that area and a resulting increase in housing prices. Thus, to improve the lives of low-income households, many of whom are renters, the rent increase must not erode the benefit from a better quality of life. Otherwise, housing market pressures may displace tenants from their current residences.¹¹ It is important to choose assets for which low-income households will benefit relative to high-income households.¹² Glaeser, Kahn, and Rappaport (2008) showed that low-income

¹¹ Recent empirical literature on gentrification made the opposite conclusion: that low-income and minority residents do not leave gentrifying neighborhoods more than they do nongentrifying neighborhoods. In fact, high school-educated African Americans' probability of remaining increases in gentrifying neighborhoods (Kiviat, 2008).

¹² One measure of the income elasticity of demand for public transportation in the United States is -0.62 (Holmgren, 2007), which suggests an inferior good.

households live in central cities to take advantage of dense transportation networks, so extending rail lines would be a progressive strategy. Baum-Snow and Kahn (2005) found that the primary beneficiaries of expanding railway lines are former bus riders.

The net effect on low-income households can be known only after considering the impact on the housing market. Bowes and Ihlanfeldt (2001) emphasized three real estate effects of siting transit: (1) a direct hedonic effect, (2) the value of increased commerce, and (3) more crime. The researchers found that the direct effect dominates and that increased commerce generally trumps the increased crime effect. The sum and mix of effects vary with neighborhood characteristics such as income and distance to the central business district (CBD). A price decline is estimated in all low-income neighborhoods except those within 1/4 mile of a transit stop but between 7 and 10 miles distant from the CBD. From this very detailed study, siting a railway station appears unlikely to drive low-income households from their homes.

Moving People

A fundamental motivation for mobility policy is to provide access to education, job centers, and social contacts that would improve income opportunities for members of protected classes.¹³ A key economic argument for mobility policy is that, for a household to maximize its welfare, discrimination or regulatory barriers should not constrain its choice.

Scattered-site development, mixed-income development, and mobility policy that combines vouchers with special efforts to redirect households are some ways to desegregate assisted housing. Goetz (2003) described three approaches to mobility policy: (1) require tenants to move to deconcentrated neighborhoods,¹⁴ (2) through mobility counseling, encourage households to choose neighborhoods they would not have otherwise, and (3) actively recruit landlords in areas not traditionally receptive to voucher tenants. Mobility policy is not the sole domain of the federal government, and a PHA can create its own mobility program or partner with a nonprofits, city government, or even another PHA to provide greater options to voucher households.

For example, HUD might provide program participants data that indicate disparities in access to community assets that, on further analysis, appear more acute for public housing residents, many of whom are racial and ethnic minorities. Using this information, program participants could choose to reduce access disparities by providing affordable units in communities throughout the region. A PHA might respond by expanding its services to tenants seeking available voucher units by providing listings of units and emphasizing options in neighborhoods where successful leasing would reduce the observed disparities in access to community assets.

As with the other examples, the ultimate impact of the proposed policy is difficult to assess. Voucher holders have full discretion in the units they pursue, and the PHA's policy in this example may

¹³ Evidence on the impact of neighborhood on a household is of direct relevance to mobility policy, but the diversity of dependent variables studied, econometric methods used, and theoretical approaches unfortunately makes it difficult to draw definitive conclusions except that neighborhood effects exist (Durlauf, 2004).

¹⁴ As Goetz (2003) noted, requiring deconcentration is likely to dampen a household's enthusiasm concerning their new destination.

or may not influence the voucher holder to seek out units in target neighborhoods.¹⁵ By enabling low-income families to move from high- to low-poverty neighborhoods, vouchers potentially reduce segregation and provide protected households the benefits associated with high-income neighborhoods.¹⁶ The housing subsidy and the opportunity cost of forgoing benefits from living in racially or ethnically concentrated areas are additional costs.¹⁷

Conclusion

The AFFH regulation would improve the process for carrying out a statutory mandate, potentially improving the lives of protected classes who face barriers to fair housing choice. The best outcome of the rule would be for each jurisdiction to have the capacity and a well-considered strategy to affirmatively further fair housing. The proposed rule does not prescribe, compel, or enforce concrete actions by local governments, however. The rule instead encourages a more engaged and data-driven approach to assessing the state of fair housing and planning actions.

Our estimates suggest the proposed rule would generate relatively limited additional paperwork and planning costs. Program participants already are required to engage in outreach and collect data, and AFFH would reduce data burdens. Any potential additional outreach costs are expected to be relatively minor, so compliance costs of the proposed rule and the current regime appear comparable.

Regarding community impacts, this analysis highlights the tremendous uncertainty regarding how the new AFH-generated information would translate into different actions by program participants, which suggests little probability that any particular outcome occurs. Moreover, the analysis identifies significant uncertainty about how much specific actions would advance fair housing goals, which is not to discourage pursuit of such policies and actions but to acknowledge policy limits.

Actions taken by program participants as a result of this rule may represent new local approaches to reducing segregation, eliminating racially concentrated areas of poverty, and reducing disparities in access to community assets. HUD believes some of these new approaches would better achieve the goals of fair housing, meaning that communities would be more integrated, fewer people would live in high-poverty, segregated neighborhoods, and access to high-quality education, job opportunities, and other community assets would be more equal.

¹⁵ Cunningham and Sawyer (2005) found that voucher holders enrolled in the mobility program moved to “opportunity neighborhoods” only slightly more often than unenrolled voucher holders.

¹⁶ Two sources provide empirical evidence on the impacts of mobility programs. Rosenbaum (1995), who analyzed data on public housing residents, showed that families in the Chicago suburbs experienced better outcomes than those in the city, particularly children’s educational outcomes. HUD (2011) found that whether an outcome measure improves appears to depend on the outcome measure (mental health improved, for example) and the type of individual.

¹⁷ Johnson, Ladd, and Ludwig (2002) found that the estimated benefits of mobility programs (approximately \$20,000) outweigh actual counseling costs (\$3,000) and the likely inefficiencies of providing in-kind housing subsidies (\$500 per year).

Acknowledgments

The authors thank Camille Acevedo, Robert Collinson, Nestor Davidson, Patrick Fuchs, Danilo Pelletiere, Patrick Pontius, Ross Rutledge, Kurt Usowski, Sheryl Whitney, and Ken Zimmerman for their assistance with previous drafts of this analysis.

Authors

Raphael Bostic is the Judith and John Bedrosian Chair in Governance and the Public Enterprise at the University of Southern California, Sol Price School of Public Policy. He was previously the Assistant Secretary for Policy Development and Research at the U.S. Department of Housing and Urban Development.

Alastair McFarlane is Director of the Division of Economic Development and Public Finance in the Office of Policy Development and Research at the U.S. Department of Housing and Urban Development.

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Industrial Revolution

Every home makes compromises among different and often competing goals: comfort, convenience, durability, energy consumption, maintenance, construction costs, appearance, strength, community acceptance, and resale value. Often consumers and developers making the tradeoffs among these goals do so with incomplete information, increasing the risks and slowing the adoption of innovative products and processes. This slow diffusion negatively affects productivity, quality, performance, and value. This department of Cityscape presents, in graphic form, a few promising technological improvements to the U.S. housing stock. If you have an idea for a future department feature, please send your diagram or photograph, along with a few, well-chosen words, to elizabeth.a.cocke@hud.gov.

High-Efficiency Windows: The Frontier of High- Performance Construction

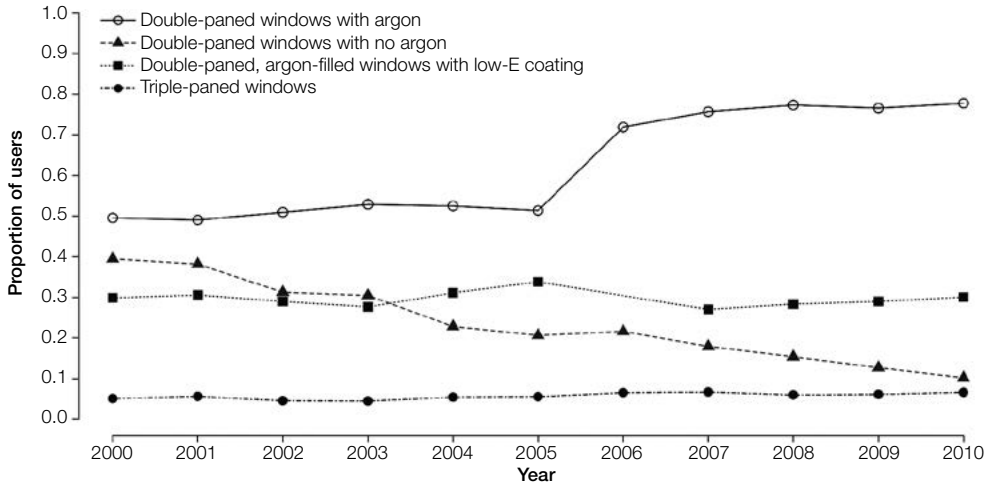
Andrew P. McCoy

Virginia Polytechnic Institute and State University

New generations of high-efficiency windows (HEWs) protect residents from harmful radiation, conserve and resist energy flows (thermal efficiency), and are increasingly specific to the needs of the homeowner and the unit.

Windows not only serve to let in light and air, but they are also critical in controlling conduction and radiation as a result of the light and air. In high-performance home construction, where tightness of construction (air leakage) and efficiency of walls (resisting heat transfer) are critical, the performance of HEW units becomes a key factor in ensuring efficiency for the building's envelope (builder) and operation (homeowner).

Technological innovation in the window market has been very active over the past 20 years. The typical American home before the 1990s contained single-paned glass units or double-paned units with little thermal efficiency. By the late 1980s, double-paned windows began benefiting from the inclusion of low-emissivity coatings, or low-E coatings, that manufacturers apply to one side of the glass, which reduces energy flow through the glass. Low-E coatings remained the innovative choice in the 1990s, because the cost of manufacturing these units became less over time. Since the mid-1990s, manufacturers have developed gas-filled glazing to ensure performance in windows. This innovation resulted from manufacturers introducing a dense gas (typically inert, such as argon), between two panes of glass, which insulates against thermal conductance. Exhibit 1 illustrates the

Exhibit 1**Use of High-Efficiency Windows, 2000 Through 2010**

low-E = low-emissivity.

high-efficiency window cluster options since 2000 that have rapidly displaced the lower efficiency alternative (listed second in exhibit 1 as double-paned windows with no argon), which dropped from 40- to 10-percent market share.

Typical High-Efficiency Windows

Traditional window products include single- and double-paned windows without the use of energy-efficient technologies. HEWs are those outside the traditional technology that include energy-efficient technologies. Although they come in many versions, materials, and types, a basic classification of current HEW off-the-shelf options is as follows—

- Double-paned windows with argon.
- Double-paned, argon-filled windows with low-E coating.
- Triple-paned windows.

Double-paned windows come in many sizes and types, many of which can be purchased locally. Some common types of windows are fixed (nonopening), awning (hinging up), casement (hinging left or right), single- or double-hung (separate sections that move up and down independently), and slider (separate sections that move side to side independently). Placing windows will vary in difficulty depending on the size, type, and connection detail; for example, some windows are manufactured with a flange that allows for easy connection to the framing of the home. Triple-paned windows are being used outside the United States with success, but they still remain a custom option that is expensive in the U.S. market.

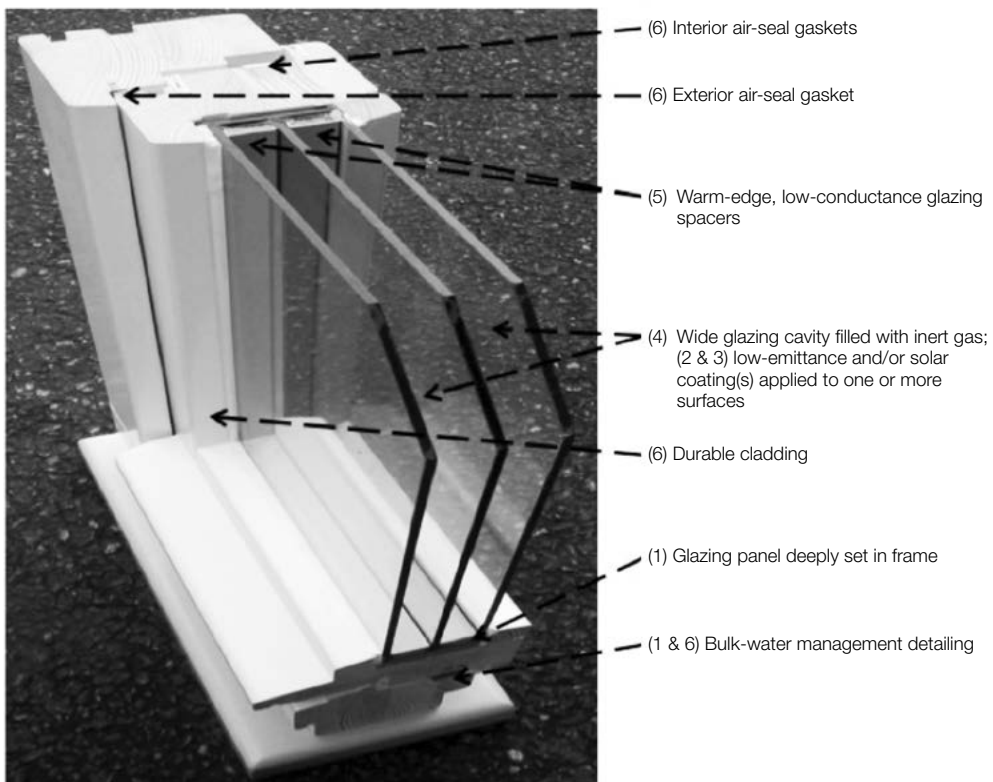
The National Fenestration Rating Council's (NFRC's) classification system helps consumers understand the benefits of the different window options. The NFRC rating information is a label that the manufacturer pastes onto each product. The consumer can use the label to determine the product's basic thermal and optical properties.

- U-value (thermal resistance; the lower, the better).
- Solar heat-gain coefficient (amount of solar radiation that passes through).
- Visible transmittance (amount of light in the visible portion of the spectrum that passes through).
- Air-infiltration rate (amount of air that leaks through cracks in and around the window).

When selecting an HEW option, consumers will find many recent technological improvements, such as glazing unit structure; low-emittance (also called low-emissivity, or low-E) coatings; solar-control glazings and coatings; low-conductance gas fills; warm-edge spacers; and thermally improved sash, frame, and weather stripping. Exhibit 2 shows a sectional view (cross-cut image) of a triple-paned, argon-filled, low-E HEW that includes these technological innovations.

Exhibit 2

Anatomy of a High-Efficiency Window (sectional view)



Note: Numbers indicate technological improvements as follows: (1) glazing unit structure; (2) low-emittance (also called low-emissivity, or low-E) coatings; (3) solar-control glazings and coatings; (4) low-conductance gas fills; (5) warm-edge spacers; and (6) thermally improved sash, frame, and weather stripping.

Benefits of High-Efficiency Windows

Please refer to the numbers in the note of exhibit 2 for the explanation that follows. The benefits of using these technologies are various.

- Current glazing unit structures (1) are required to be more durable to physically support the glass and technologies surrounding energy-efficient options. As an example, the window structure and hardware that contain a single pane required major changes in design and durability when adding the weight of more panes.
- Glazings with low solar heat gain coatings (2 and/or 3) have minimal loss of visible light, which could obscure view.
- Coatings (2 and/or 3) reduce fading from ultraviolet light and can significantly reduce winter heat loss and summer heat gain.
- Heating and air-conditioning systems can be smaller due to heating and cooling load reduction (4).
- Similarly, improved general comfort from reduced “hot” or “cold” spots (4), in turn, enables residents to make lower demands on their heating and cooling systems.
- Frame materials and coatings (5 and/or 6) resist conduction and reduce condensation, also requiring less airflow across them.

Acknowledgments

The author thanks Rich Backus of netPLUS energy school for his helpful insight into the anatomy of a high-efficiency window product.

Author

Andrew P. McCoy is Director of the Virginia Center for Housing Research and an associate professor in the Department of Building Construction at Virginia Polytechnic Institute and State University.

Additional Information

Many websites offer extensive information on the specifications and use of HEWs. Also, the PATH (Partnership for Advancing Technology in Housing) Technology Inventory on the www.toolbase.org website provides additional information.

Policy Briefs

The Policy Briefs department summarizes a change or trend in national policy that may have escaped the attention of researchers. The purpose is to stimulate the analysis of policy in the field while the policy is being implemented and thereafter. If you have an idea for future Policy Briefs, please contact david.l.hardiman@hud.gov.

The Public Purpose of FHA

Roberto G. Quercia

Kevin A. Park

The University of North Carolina at Chapel Hill

Abstract

Recent reviews of the Federal Housing Administration's Mutual Mortgage Insurance (MMI) Fund find that the losses on its portfolio are projected to exceed the revenue from its existing insurance policies and its current capital resources. This article places the MMI Fund's "negative economic value" and recent draw on the U.S. Treasury in context and argues that the justification for federal mortgage insurance is the public purpose it serves by filling gaps the private sector leaves, thereby contributing to a healthy and stable housing market.

Introduction

The National Housing Act of 1934 created the Federal Housing Administration (FHA) to help stabilize the economy. In the depths of the Great Depression, up to 1,000 homes were foreclosed on every day, creating distress for American households and financial institutions (Wheelock, 2008). The Mutual Mortgage Insurance (MMI) Fund administered by FHA is supported through premiums that are in proportion to the outstanding loan amount and paid by the borrower. The mortgage insurance, backed by the full faith and credit of the U.S. government, provides coverage for the full amount of the loan. Relieved of the risk of loss in the event of default, lenders can more confidently extend credit at lower prices. FHA also popularized the 30-year, fixed-rate, fully amortizing mortgage that eventually became the staple of the American residential mortgage system. Along with a similar program administered by the Veterans Administration (VA), FHA insurance helped increase the homeownership rate from 43.6 percent in 1940 to 61.9 percent in 1960.¹

¹ For a detailed history of FHA to the early 1990s, see Vandell (1995).

As a public insurance fund, FHA pools risks from where and when conventional mortgage credit is scarce, whether for underserved borrowers, regions, or time periods. For example, geographically uniform premium rates mean borrowers in thriving markets help support households in economically depressed regions. In addition, although each year's book of business is intended to be self-supporting, mandatory capital reserves in excess of projected losses allow for premiums collected from periods of growth to help compensate for unexpected losses when the market falters. FHA is currently reprising its Great Depression role with an elevated market share symptomatic of the weakness in the private conventional mortgage market. In keeping with its original purpose, FHA has maintained access to credit to stabilize the housing market.

The most recent reviews of FHA's financial position, however, found that the losses on its current portfolio were projected to overwhelm FHA's capital resources (Integrated Financial Engineering, 2012; OMB, 2013). Although FHA has struggled with managing some of its risks, these losses are primarily an indication of the enormous burden FHA has undertaken to stabilize a collapse in the national housing market unprecedented since the Great Depression.

This article outlines the importance of FHA's public purpose in maintaining an adequate supply of mortgage credit through regional and national downturns and provides context for understanding FHA's current financial condition. This article specifically examines so-called "forward" mortgages insured through the MMI Fund, as opposed to Home Equity Conversion Mortgages (HECMs), or "reverse" mortgages, which FHA also insures.²

The Current Financial Health of FHA

The MMI Fund stores its capital resources in two accounts: a *financing account* equal to projected costs and *capital reserves* for any remaining funds. With roughly \$33 billion available to pay claims, the MMI Fund has enough capital to continue paying claims at the current rate for roughly 7 years. As U.S. Department of Housing and Urban Development (HUD) Secretary Shaun Donovan stated, "[T]his is not a cash problem; it is one of setting the right size of loan loss reserves aside" (Donovan, 2013: 6).

By contrast to cashflow accounting, the *economic value* of the MMI Fund is defined as the net present value of existing insurance policies, including projected revenue and claims during the life of those loans, and the amount of current capital resources. The federal budgeting process, overseen by the Office of Management and Budget (OMB) under the terms of the Federal Credit Reform Act of 1990, and a separate independent actuarial review required by the National Affordable Housing Act (NAHA) of 1990 determine the economic value.

NAHA also mandated that the MMI Fund maintain at least a 2-percent capital ratio, defined as the Fund's economic value as a share of its insurance-in-force.³ These capital reserves allow for the

² HECMs were included in FHA's General Insurance Fund before fiscal year 2009 before being moved to the MMI Fund by the Housing and Economic Recovery Act of 2008. The actuarial reviews of the MMI Fund still analyze HECMs separately.

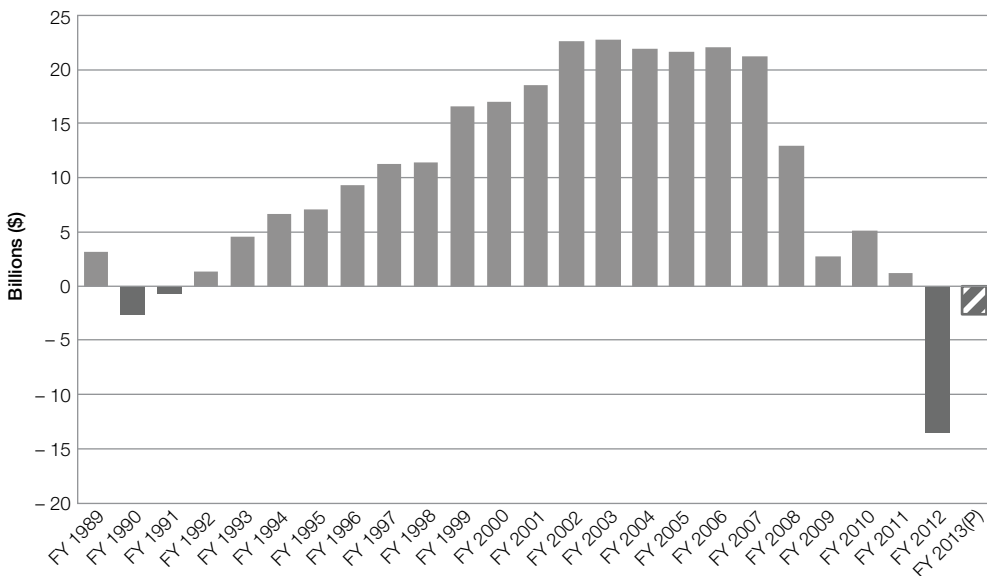
³ NAHA instructs that the unamortized value of the insurance-in-force be used as the denominator.

Fund to weather unexpected increases in actual and projected losses on existing books of business. As recently as fiscal year (FY) 2007,⁴ the Fund had a capital ratio of 6.4 percent—three times its mandated level of reserves. In the past 5 years, however, the economic value of loans endorsed by FHA has fallen by nearly \$35 billion (see exhibit 1). At the same time, FHA more than tripled its level of insurance-in-force, from \$332 billion to more than \$1.1 trillion. The simultaneous decrease in the denominator and increase in the numerator caused the capital ratio to fall to less than 0.1 percent in FY 2011 and ultimately to -1.2 percent in FY 2012.

The last actuarial review projected losses on forward loans to eventually exceed projected revenues and current capital resources by nearly \$13.5 billion. HUD’s (2012) annual report to Congress noted these losses exceed those projected last year for three reasons: (1) a lower house price appreciation forecast (-\$10.5 billion), (2) the continued decline in interest rates (-\$8 billion), and (3) a refinement in methodology (-\$10.2 billion). On September 30, 2013, FHA was required to draw \$1.7 billion from the U.S. Treasury to cover losses on its forward loan and HECM portfolios (Galante, 2013b). FHA needed appropriations to cover its insurance activities for the first time in its history.

Exhibit 1

The Economic Value of the MMI Fund, FYs 1989–2013



FY = fiscal year. MMI = Mutual Mortgage Insurance. (P) = projected.

Note: Includes only forward loans.

Sources: Deloitte & Touche LLP; Integrated Financial Engineering Inc.; Szymanoski (2012)

⁴ The fiscal year for the federal government begins in October of the previous calendar year (for example, FY 2013 begins on October 1, 2012).

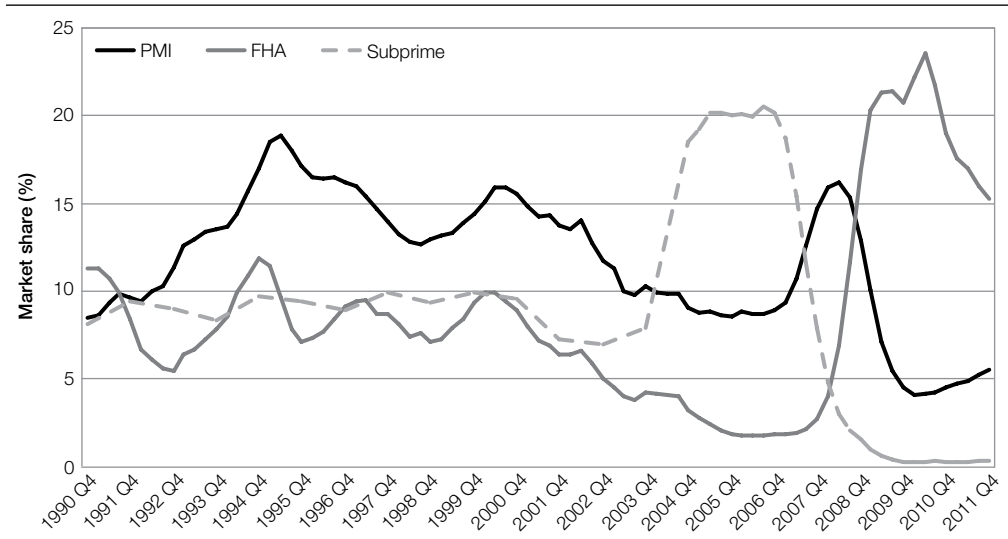
FHA in the Great Recession

As in previous recessions, FHA stepped up its operations in an effort to stabilize the housing market. Since 2008, FHA has helped 4.6 million households buy a home and nearly 3.2 million homeowners, including many who are under water, refinance to lower rates. In part, this assistance has been possible because Congress has repeatedly increased the maximum loan amount that FHA is permitted to insure. First, in 2006, Congress authorized FHA to insure loans of up to \$200,160 and of up to \$363,790 in high-cost housing markets. Then, in 2008, the Emergency Economic Stabilization Act and Housing and Economic Recovery Act (HERA) temporarily increased those limits to \$271,050 and \$729,750, respectively (HUD, 2012). These loan-limit increases allowed for FHA to serve a broader segment of the mortgage market. At the same time, private lenders substantially reduced access to conventional mortgage credit, leaving FHA as a last resort for American households. Even among mortgages of less than \$200,000, FHA insured nearly four times as many loans in 2009 as it did in 2006, accounting for nearly 62 percent of the total increase in FHA endorsements in that period.⁵

The pattern of FHA’s market share clearly demonstrates its countercyclical role (see exhibit 2). Between 1990 and 2003, private mortgage insurance (PMI) accounted for roughly 13 percent of the entire mortgage market by dollar volume, according to *Inside Mortgage Finance*. FHA accounted for less than 7 percent. Both types of insurers, however, lost market share during the housing bubble

Exhibit 2

Three Waves of Market Share: PMI, FHA, and Subprime, 1990–2011



FHA = Federal Housing Administration. PMI = private mortgage insurance. Q4 = fourth quarter.

Note: Four-quarter moving total by dollar volume.

Source: Inside Mortgage Finance

⁵ Based on calculations of first lien purchase and refinance mortgages for owner-occupied, one- to four-unit properties using Home Mortgage Disclosure Act (HMDA) data.

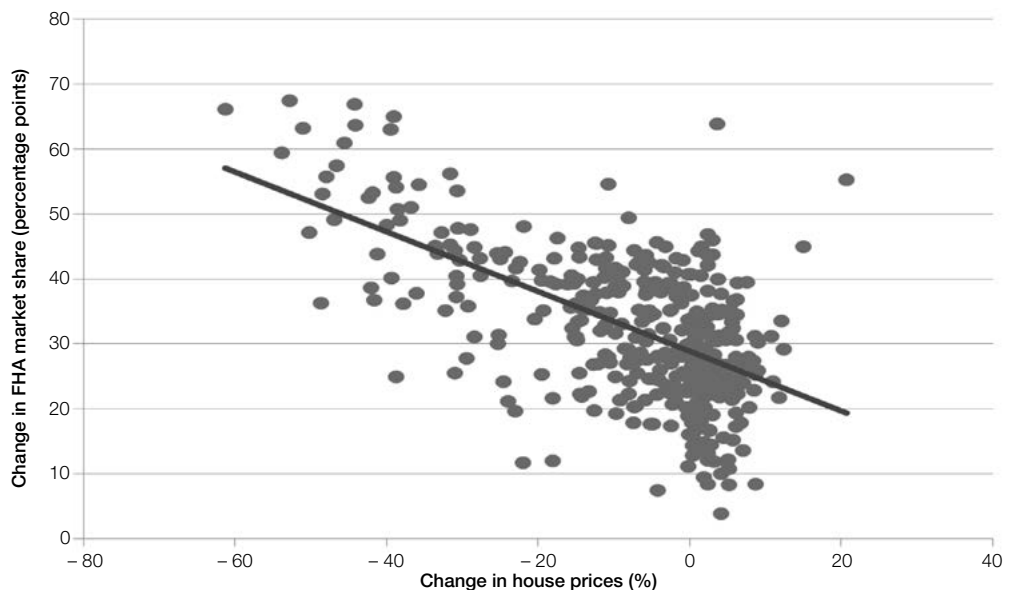
to subprime lenders that offered mortgages with high loan-to-value (LTV) ratios without mortgage insurance, sometimes using a subordinate, “piggyback” lien for the downpayment. Between 2004 and 2006, subprime lenders accounted for nearly 20 percent of new mortgage originations, whereas PMI fell to less than 9 percent and FHA to slightly more than 2 percent. As the housing market collapsed, PMI briefly regained its prebubble market share, but losses constrained its ability to continue serving the demand for new mortgage originations. Since the beginning of 2009, PMI has accounted for less than 5 percent of the market; meanwhile, FHA has accounted for as much as nearly 24 percent and for 19 percent on average.

FHA’s countercyclical role is also evident from its geographical distribution. Private mortgage insurers implemented “distressed area” policies, making it almost impossible to obtain conventional mortgages with LTV ratios of greater than 90 percent in some regions of the country (Avery et al., 2009). By contrast, FHA does not vary its insurance premiums by region, creating an automatic regional stabilization policy.

A plot of FHA’s market share change from 2006 to 2009 among owner-occupied home purchase mortgages reveals market share increased most in metropolitan areas that suffered the greatest decrease in house prices in the bust (exhibit 3). Although FHA typically had a very minor role in those markets during the runup, these markets were the most severely cut off from conventional credit when the crisis hit and therefore benefited most by FHA’s revival. This finding is consistent with research that shows that FHA’s market varies regionally by cyclical and permanent risk characteristics (Ambrose, Pennington-Cross, and Yezer, 2002; Immergluck, 2011).

Exhibit 3

FHA Lending Into “Distressed Markets,” 2006–09



FHA = Federal Housing Administration.

Note: First lien home purchase mortgage originations for owner-occupied one- to four-unit properties.

Sources: Federal Housing Finance Agency; Home Mortgage Disclosure Act

By continuing to help finance mortgages even as house prices fell and unemployment rose, FHA fulfilled its public mission to step in when and where the private market fails. According to estimates by Moody's Analytics, if FHA had stopped insuring new mortgages in October 2010, by the end of 2011 house prices would have fallen another 25 percent, new and existing home sales would have fallen an additional 40 percent, and new home construction would have dropped 60 percent. As a result, the economy would have contracted another 2 percent and an additional 3 million jobs would have been lost, causing unemployment to rise to nearly 12 percent (Griffith, 2012). Such a disastrous situation would inevitably have caused FHA's earlier books of business to have performed more poorly, not to mention caused significant losses for other participants in the housing and mortgage markets—PMI companies, the taxpayer-supported government-sponsored enterprises (GSEs) Fannie Mae and Freddie Mac, mortgage lenders and investors, and American households.

Arguments Concerning Public Mortgage Insurance

The proper role of FHA in the modern housing finance system is a topic of much debate. When FHA's share of the market fell to less than 5 percent in the mid-2000s, some suggested that public mortgage insurance was obsolete, claiming new developments in the conventional market would suffice. Today, the cost to American taxpayers, the presence of a PMI industry, and the foreclosure rates on FHA-insured mortgages raise further questions about the value and viability of FHA. Criticisms of FHA are nevertheless often built on a misunderstanding of the public purpose of federal mortgage insurance. As FHA Commissioner Carol Galante (2013: 3) recently testified, "By design, FHA's programs are meant to complement, not supplant, private capital. They are there to combat a lack of available mortgage credit when private capital retreats or underserves markets, and to step back when private capital returns or expands to serve previously underserved populations. And because of this unique role, its business cannot and should not be evaluated on the same terms as a private firm, as such a requirement would force FHA to act as a private firm and therefore eliminate its value in providing countercyclical liquidity and credit to underserved markets." We examine some of these questions in the following section.

Cost to Taxpayers

Since using \$10 million to establish the MMI Fund in 1934, FHA did not require taxpayer funds until 2013. For nearly 80 years and more than 40 million loans insured, the Fund had been self-supported on revenue from insurance premiums. Under the Federal Credit Reform Act, however, a negative economic value as determined by OMB would require FHA to supplement its capital with funds from the U.S. Treasury.⁶ In the spring of 2012, OMB (2012) estimated that the Fund would require \$688 million by the end of the fiscal year, but FHA was able to generate sufficient revenue to forestall the need for appropriations—aided in part by \$1 billion garnered from the multibillion-dollar state and federal settlement with mortgage servicers. President Obama's last

⁶ The Federal Credit Reform Act exempts several agencies, including the Federal Deposit Insurance Corporation, National Credit Union Administration, Pension Benefit Guaranty Corporation, National Flood Insurance, and Tennessee Valley Authority, but not FHA.

budget projected the Fund will need \$943 million to cover expected losses during the next 30 years, largely because of the Fund's reverse mortgage portfolio (OMB 2013). As noted, at the end of fiscal year 2013, the MMI Fund ultimately required a \$1.7 billion appropriation to comply with the Federal Credit Reform Act. Congressional action was not required because FHA's original legislation granted it the authority, called "permanent indefinite budget authority" under the Credit Reform Act, to draw on public funds if necessary.

The MMI Fund has had a negative economic value in the past without requiring taxpayer funds. An independent actuarial review in FY 1990 also found that projected losses overwhelmed capital resources and premium revenue. Recognizing that the Fund was in trouble, FHA and Congress implemented several reforms, including NAHA.⁷ By reforming its premium structure and endorsing new books of business with positive economic values, FHA successfully achieved its mandated capital requirement in only 4 years without taxpayer dollars. A transfer from the U.S. Treasury was not required in the early 1990s because the Federal Credit Reform Act did not come into effect until FY 1992.

An important reminder is that only the MMI Fund's *existing* books of business determine its economic value. The Fund could again grow out of its current predicament without exhausting its capital resources, as it did in the 1990s. As noted, the Fund has more than \$33 billion in total capital resources to continue paying claims. The last actuarial analysis estimates only a 5-percent chance that the Fund will exhaust these resources in the next 7 years, in part because new books of business are highly profitable. The most recent books of business, from FY 2010 through FY 2012, are projected to net the Fund \$22.7 billion in economic value (Integrated Financial Engineering, 2012).

The first commissioned independent actuarial report for FY 1989 recognized that, although the MMI Fund should be able to withstand a moderate downturn, it would be inefficient to reserve for a "Great Depression" scenario. "[W]e assume that the social purpose of the Fund is such that it should not be expected to withstand such a calamity" (Price Waterhouse, 1990: 30).⁸ Instead, FHA is intended to use the full faith and credit of the federal government to stabilize the housing market in such an event. As former FHA Commissioner, John C. Weicher (1995: 421) stated, "[T]he fact that FHA does not lose money on its home mortgage insurance is not a justification for its existence; the justification is that it serves a public purpose. Serving that purpose without losing money is an indication that FHA home mortgage insurance works reasonably well—not perfectly, but reasonably well."

⁷ For an overview of issues leading up to NAHA, see Weicher (1992).

⁸ The "Great Depression" scenario consisted of "four consecutive years of 10 percent nominal declines in house prices, a rise in the unemployment rate to 20 percent, and 5 percentage point declines in interest rates" (Price Waterhouse, 1990: 30). The actual experience of the housing market in the recent Great Recession approaches this doomsday scenario: 4 years of 10-percent house price declines equate to a 34.4-percent peak-to-trough decline; according to the Standard & Poor's/Case-Shiller® National Home Price Index, the country experienced a 34.7-percent decline, albeit spread over nearly 6 years. The effective federal funds rate fell more than 5 percentage points between February 2007 and December 2008 before hitting the 0 lower bound, although the decline was more muted in longer term securities. For example, the contract rate on a 30-year, fixed-rate mortgage reported by the Mortgage Bankers Association fell from 7.08 percent in the middle of June 2006 to 3.63 percent by the end of September 2012—only a 3.45-percent-point decline. The headline unemployment rate peaked at only 10.6 percent, but the broader U-6 measure that includes workers marginally attached for economic reasons reached 18 percent in January 2010.

Competition With the Private Sector

A PMI industry was created in New York as early as the 1880s and grew substantially in the 1920s.⁹ PMI was unable to weather the devastation of the Great Depression, however. It returned as a more regulated and robust industry in the 1950s, creating a state of competition with FHA. “Once it had demonstrated the viability of the FHA mortgage and mortgage insurance, FHA began to lose market share in the home mortgage market to conventional lenders and to the private mortgage insurers. This loss was only to be expected and was fully consistent with FHA’s basic purpose” (Weicher, 1995: 428).

Although public and private mortgage insurance programs as they exist today differ in several technical ways,¹⁰ the fundamental difference is that FHA mortgage insurance is backed by the full faith and credit of the federal government, whereas PMI is not. Competition with a public mortgage insurance program, which does not need to earn profits commensurate with its risk, may seem to put PMI at a disadvantage. By offering less expensive mortgage insurance and requiring stricter underwriting standards, however, PMI effectively selects the most creditworthy borrowers from the insurance pool.

Congress also prevents FHA from insuring loan amounts above certain limits, restricting its market share. Although the loan limit was high enough to cover more than 85 percent of owner-occupied homes in the 1930s, it often failed to adjust for house price appreciation, restricting FHA to lower cost segments of the housing market (Vandell, 1995). In 2006, FHA accounted for only 4 percent of the mortgage market and even less in booming housing markets.¹¹ The increase in FHA’s market share to nearly 24 percent of the total market, including 42 percent of home purchase loans, by 2009 partly reflects the increase in its maximum loan limits. Among loans of \$200,000 or more, FHA’s overall market share increased from 1.1 percent in 2006 to 18.5 percent in 2009 and its home purchase market share increased from 1.4 percent in 2006 to nearly 33 percent in 2009. Even among loans of less than \$200,000, however, FHA’s market share also increased dramatically, rising from 6.3 to nearly 28 percent of the overall market and from 9.4 to 47.5 percent of the home purchase market during the same period.

The absence of the full faith and credit of the federal government means PMI companies must maintain a positive economic value at all times. An insolvent insurer will file for bankruptcy or be taken over by regulators, as was the case in the most recent downturn.¹² Even a solvent insurance

⁹ For more information about the early history of PMI, see Alger (1934), Graaskamp (1967), and Gray and Terborgh (1929).

¹⁰ For example, PMI covers only 20 to 30 percent of a mortgage, whereas FHA insures the entire amount. The first independent actuarial report explicitly states, “[T]he difference between the 20 percent per loan risk taken by [PMI companies] versus the 100 percent per loan risk taken by FHA also renders use of the [PMI companies] 4 percent capital-to-risk requirement less meaningful to FHA” (Price Waterhouse, 1990: 9).

¹¹ Based on calculations of first lien purchase and refinance mortgages for owner-occupied, one- to four-unit properties using HMDA data.

¹² PMI Group Inc., the parent company of PMI Mortgage Insurance Co., filed for bankruptcy in November 2011 because of losses incurred in the Great Recession. In the bankruptcy petition, PMI Group’s chairman and chief executive officer, L. Stephen Smith, noted that mortgage insurance companies are “more susceptible to the cyclical nature of the economy in general, and the housing and labor markets in particular, than many other types of insurance companies” (Smith, 2011: 10).

company must maintain sufficient levels of capital, or else it may be restrained from taking new business, making a housing market recovery challenging. Several private mortgage insurers currently rely on forbearance from their regulators regarding their mandatory capital ratios to continue to endorse new business (Moody's Investors Service, 2012).

By contrast, FHA can have, as it currently does, a negative capital ratio, but it is not illiquid and does not face capital restraints. The backing of the federal government means investors will still value FHA insurance even if projected losses exceed the capital resources and expected revenue on existing books of business. In a study for Genworth Financial, another PMI company, Promontory Financial Group (2011: 58) noted FHA's powerful resiliency: "Though large contingency reserves enable PMIs to continue paying claims in highly adverse economic scenarios, they do not always permit PMIs to continue incurring additional risk. In these circumstances, the government insurers, particularly FHA, can step in to absorb the additional risk and smooth out the bottom of the cycle." As Secretary Donovan (2013: 4) stated, "FHA's current slightly elevated market share is primarily due to a substantial decrease in the size of the total mortgage market rather than exceptionally high FHA loan volumes. As the market continues to recover and private capital returns at more normal levels, FHA's role will naturally recede."

This resiliency is unique to a public insurance fund and especially important for housing finance, which is susceptible to periods of boom and bust. Because the value of a property serves as collateral for its mortgage, but that value is in part dependent on the general availability of credit, house price increases serve as the basis for an additional extension of credit or, conversely, price declines lead to a reduction in the availability of credit (Kiyotaki and Moore, 1997). House price declines are particularly destabilizing given most American homeowners' substantial degree of leverage. Mortgage debt can deepen housing downturns as homeowners are unable to prepay, refinance to a lower interest rate, or move into a new house, creating a general decrease in market liquidity (Caplin, Freeman, and Tracy 1997; Stein, 1995). The decrease in home equity that accompanies house price declines increases the risk of default among all mortgage borrowers, and any default has the effect of further depressing neighboring house values (Immergluck and Smith, 2006; Lin, Rosenblatt, and Yao, 2009; Schuetz, Been, and Ellen, 2008). Conventional risk management has difficulty with such systematic phenomena, where probabilities are not independent but correlated. By contrast, public insurance is distinctively capable of diversifying risk across time (Moss, 2004).¹³

During the housing boom, some observers wondered whether FHA needed to adopt some of the innovative "alternative" mortgage contracts used in the subprime mortgage market to maintain relevance (GAO, 2007; Jaffee and Quigley, 2007). Now that FHA's market share is unusually high, others are calling for FHA to narrow its operations to "step back from markets that can be served by the private sector" (Pinto, 2012: 42). In general, although FHA's market share ebbs and flows with economic conditions, FHA must always compete with PMI for some lower risk borrowers to

¹³ The ability of FHA to pool risk across time is further enabled by the fact that, despite its name, the MMI Fund is no longer really a mutual insurance program. Before the reforms of the early 1990s, FHA would return to borrowers through "distributive shares" any income in excess of the cost of insurance after the mortgage was prepaid or insurance terminated. Now, excess premium revenue is retained as a buffer for future—and past—downturns.

offset losses from higher risk borrowers. In discussing the possibility of increasing premium rates, FHA's first actuarial report noted, "FHA will become somewhat less competitive with the private mortgage insurers. Adverse selection should be anticipated as lower risk borrowers might be able to obtain better terms from private insurers" (Price Waterhouse, 1990: 39). As lower risk borrowers find alternative sources of mortgage credit, however, the volume of FHA endorsements will fall and the average risk of the remaining endorsements will increase, requiring higher premiums to cover expected claims. Higher premiums would further discourage lower risk borrowers from using FHA. "This state of affairs ... satisfies those who feel that the FHA should not compete in any way with the private sector, but it flies in the face of the requirement to keep the MMI Fund actuarially sound" (Vandell, 1995: 366). A similar argument could be made that insurance must be active through the housing cycle to build reserves in strong markets.

In addition, FHA broadens the market by providing homeownership opportunities not available in the private conventional market and offers a backstop to the market in periods of economic turmoil. In this way, FHA also complements the PMI industry.

Effect on Households and Neighborhoods

A lack of adequate funds for a large downpayment and closing costs has always been a substantial barrier to homeownership (Haurin, Hendershott, and Wachter, 1997; Linneman and Wachter, 1989; Quercia, McCarthy, and Wachter, 2003). At its inception, FHA reduced required downpayments to 20 percent, enabling more families than ever before to purchase a home. Later, as such loan products proved sustainable, FHA gradually decreased downpayment requirements to 5 percent in 1950 and to only 3 percent in 1961. The maximum term of FHA loans was extended, first to 20 years and then to 30 years in 1954, reducing the required monthly payments (Vandell, 1995). Mortgage products now called "traditional" were anything but before the creation of FHA. Indeed, the "nontraditional" mortgages that flooded the market during the recent housing bubble—interest-only and negative-amortization loans, hybrid adjustable-rate mortgages, and so on—have more in common with the products that predated FHA (Green and Wachter, 2005). By insuring the credit risk of long-term mortgages with high LTV ratios, FHA overcame the wariness of lenders to offer a loan contract that has since become the gold standard of American mortgages.

FHA insurance to support low downpayment mortgage lending is particularly important for first-time homebuyers. In 2011, new homeowners accounted for 75 percent of all FHA endorsements of home purchase loans, and FHA insured 41 percent of all first-time homebuyers (HUD, 2012). Lower income and minority households also rely more heavily on FHA-insured loans. During the housing bubble, these households were disproportionately likely to receive subprime mortgages (Apgar, Bendimerad, and Essene, 2007; Bocian, Ernst, and Li, 2008; Karikari, Voicu, and Fang, 2011), leading to elevated foreclosure rates when the bubble burst (Bocian, Li, and Ernst, 2010). As conventional mortgage credit became scarce, FHA was able to ensure some credit availability for these households. Between 2009 and 2011, more than 60 percent of purchase mortgage originations for Hispanic and African-American borrowers were insured through FHA compared with 36.5 percent of originations for non-Hispanic White borrowers (see exhibit 4). In addition, these loans have proven much more sustainable than products offered in the conventional mortgage market to similar borrowers.

Exhibit 4**Homeownership Rate and FHA Share of Originations by Race/Ethnicity and Household Income, 2009–11**

	Homeownership Rate (%)	FHA Share of Originations (%)
Race/ethnicity		
Non-Hispanic White	72.6	36.5
Hispanic (any race)	47.1	62.7
African American	44.2	61.5
Household income		
\$50,000 or more	79.7	34.6
Under \$50,000	50.2	51.5
Total	65.4	39.8

FHA = Federal Housing Administration.

Note: First lien home purchase mortgage originations for owner-occupied, one- to four-unit properties.

Sources: American Community Survey; Home Mortgage Disclosure Act

High LTV ratios, and the possibility for negative equity if prices fall, have long been known to contribute to a greater chance of default (Quercia and Stegman, 1992); however, for 50 years, FHA has enabled homeowners to be highly leveraged while maintaining a relatively modest rate of claims in aggregate through persisting with traditional mortgages. Fully underwritten, 30-year, fixed-rate mortgages have accounted for three-fourths of FHA endorsements by volume since FY 2000 (Integrated Financial Engineering, 2012). Such *product* features have been associated with significantly lower default rates, regardless of *borrower* characteristics (Ding et al., 2011), which helps explain why FHA-insured mortgages performed significantly better than conventional subprime mortgages through the Great Recession. According to the Mortgage Bankers Association’s National Delinquency Survey, the serious delinquency rate on subprime loans reached more than 30 percent in late 2009 and early 2010 and remained at nearly 22 percent through early 2012. By contrast, FHA-insured mortgages have had a serious delinquency rate of only about 9 percent since 2009. Quercia, Ding, and Reid (2012) examined loans originated between 2000 and 2008 and found that 32.3 percent of subprime conventional loans had defaulted by February 2011 by contrast with 14.4 percent of FHA-insured loans.

Pinto (2012) argued that, to protect borrowers and neighborhoods from a vicious cycle of foreclosure, FHA should never insure a loan with a projected claims rate greater than 10 percent. FHA’s underwriting standards already establish implicitly an “acceptable” claims rate by setting maximum LTV and debt-to-income ratios, and so on, but any discussion of the social implications of the risk of default must also consider the effect on the access to credit. In that sense, weighing the costs and benefits of FHA’s underwriting criteria parallels the debate about proposed definitions of Qualified Mortgages (QMs) and Qualified Residential Mortgages (QRMs) required by the Dodd-Frank Wall Street Reform and Consumer Protection Act of 2010. Quercia, Ding, and Reid (2012) directly compared the reduction in defaults that would have occurred from stricter underwriting with the reduction in the access to credit, particularly among lower income and minority households. The authors concluded that the reduction in foreclosures resulting from restrictions beyond the QM product requirements, such as prohibitions on low- or no-documentation, interest-only, and negative amortization loans, balloon payments, and so on, do not outweigh the costs of reducing borrowers’ access. In particular, requiring higher downpayments had limited benefits when compared with the number of borrowers excluded from the market.

Recent Regulatory Changes

During the past several years, FHA and Congress have again taken steps to recapitalize the MMI Fund.

For example, seller-funded downpayment assistance programs, which are associated with high default rates and substantial losses, were banned in 2008. The Internal Revenue Service characterized these programs as “self-serving, circular financing arrangements” that skirted HUD rules against the seller’s providing a gift to the homebuyer that was not subtracted from the house price (IRS 2006). Instead, FHA effectively financed downpayments through artificially high sales prices and loan amounts (Concentrance Consulting Group, 2005; Foote, 2009; GAO, 2005). Seller-funded downpayment assistance accounted for more than 20 percent of FHA loan endorsements between FY 2005 and FY 2007. Among fixed-rate, FHA-insured mortgages with LTV ratios of more than 95 percent in these years, loans using seller-funded downpayment assistance programs are expected to result in lifetime claims 2.33 to 2.51 times greater than loans with other sources for the downpayment.¹⁴ HUD attempted to prohibit seller-funded downpayment assistance programs many times but was prevented by legal and political obstacles until HERA finally banned the practice. Those loans already on the books, however, are estimated to ultimately cost the MMI Fund \$15.25 billion according to the latest actuarial review (Integrated Financial Engineering, 2012).

FHA is also actively seeking to mitigate losses on existing insurance policies. Since mid-2009, FHA has provided loss mitigation assistance to 1.4 million homeowners with FHA-insured mortgages (Szymanoski et al., 2012). FHA has scaled up initiatives offering alternatives to foreclosure (for example, short sales) for borrowers who cannot obtain a loan modification under FHA’s Home Affordable Modification Program. As a result of these changes, the difference between sales prices and appraisal values of Real Estate Owned (REO) properties has decreased 62 percent, and time in the REO process has fallen 45 percent (Galante, 2013). FHA also established a Distressed Asset Stabilization Program aimed at selling seriously delinquent loans to third party investors at a reserve price of less than the outstanding principal balance of the loan. These efforts aim to reduce the loss severity on distressed loans. Further, a new Office of Risk Management, created in 2010, will help monitor and mitigate risk in the future.

Looking to the future, Secretary Donovan (2013: 1) noted, “Recent increases in FHA premium levels will boost FHA’s capital reserves and increase Federal revenues.” In some cases, premium increases have required congressional action. For example, the FHA Reform Act of 2010 was needed to amend the National Housing Act to enable FHA to increase annual insurance premiums over 0.55 percent. Since then, annual insurance premiums have risen to 1.35 percent (see exhibit 5). FHA premium increases since 2009 have added more than \$10 billion in economic value to the MMI Fund (Galante, 2013). Further, effective in June 2013, annual premiums will be required for the life of the loan. Previous to this requirement, under a policy implemented in 2001, insurance premiums were cancelled when outstanding loan balances fell to less than 78 percent of

¹⁴ “Standards for Mortgagor’s Investment in Mortgaged Property: Additional Public Comment Period,” 24 CFR Part 203. Federal Register 73 (116) June 16, 2008.

Exhibit 5

FHA Insurance Premiums, October 1, 2008, to April 1, 2013

Effective Date	Upfront Premium (%)	Annual Premium (%)
October 1, 2008	1.75	0.55
April 5, 2010	2.25	0.55
October 4, 2010	1.00	0.90
April 18, 2011	1.00	1.15
April 9, 2012	1.75	1.25
April 1, 2013	1.75	1.35

FHA = Federal Housing Administration.

Note: Purchase-money mortgages and full-credit qualifying refinances of less than \$625,500 with loan terms of more than 15 years and loan-to-value ratios of more than 95 percent.

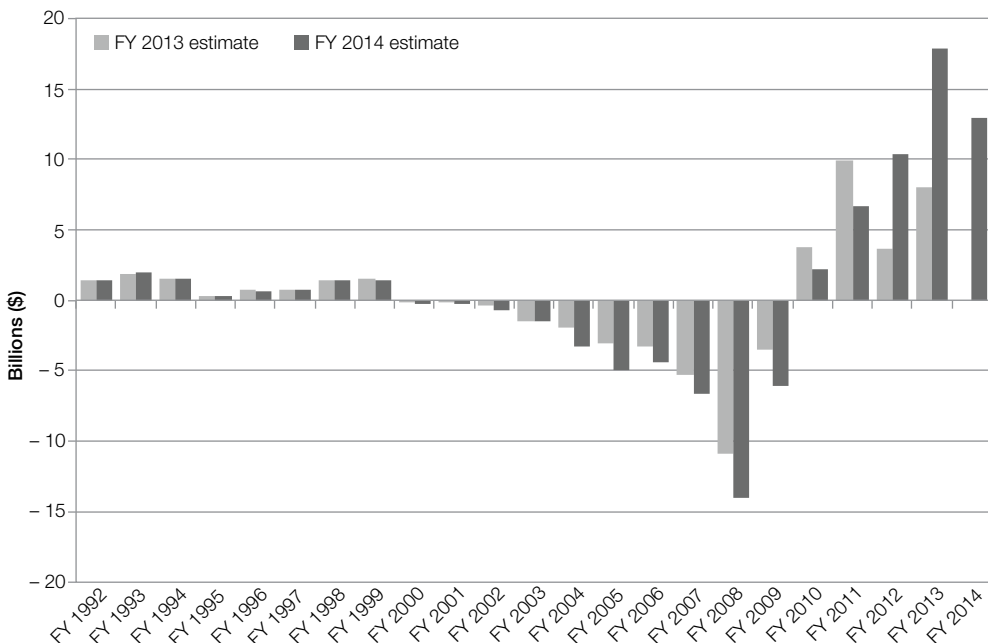
Sources: FHA Mortgagee Letters 2008-22, 2010-02, 2010-28, 2011-10, 2012-4, and 2013-04

the original balance, although FHA remained liable for the entire loan amount. Indeed, 10 to 12 percent of losses from claims have been found to occur after premiums were cancelled, resulting in \$10 billion in lost revenue for the 2010 through 2012 books of business alone (HUD, 2012).

These measures are projected to save the MMI Fund more than \$20 billion, and the effects are already evident in FHA's most recent loan endorsements. The latest books of business, from FY 2010 through FY 2012 (see exhibit 6), are projected to net the Fund between \$19 and \$23 billion in

Exhibit 6

Economic Value by Book of Business



FY = fiscal year.

Note: Includes only forward loans.

Source: Office of Management and Budget

economic value (Integrated Financial Engineering, 2012; OMB, 2013). “While the new loans being made today are profitable to FHA and we do not want to over-burden or constrict access to credit as the housing market continues to mend, we also must ensure that we are (1) rebuilding adequate reserves for the future and (2) phasing out of our counter-cyclical role by reducing FHA’s footprint in the marketplace and helping to facilitate the return of private capital” (Galante, 2013: 15). Further increasing insurance premiums could reduce FHA’s market share, but as its endorsement volumes fell FHA would find it more difficult to recapitalize the Fund and support the nascent housing recovery. Moreover, the likely effect would be to increase the role of the GSEs, Fannie Mae and Freddie Mac, from conservatorship—that is, as long as regulators and the GSEs continue to permit some insurance companies to endorse new business while exceeding maximum risk-to-capital regulations. Nevertheless, FHA will eventually return to a decreased market share through a combination of premium-rate increases, loan-limit decreases, and private-sector competition.

Although FHA’s most recent books of business have strong economic values, FHA continues to pursue reforms. For example, FHA is proposing to reduce the maximum allowable amount of sellers’ contributions toward closing costs. FHA currently allows for sellers’ concessions of up to 6 percent of the sales price. Additional contributions are considered “inducements to purchase” and result in a dollar-for-dollar reduction in the sales price when calculating the loan’s LTV ratio. The proposal would reduce allowable concessions to 3 percent or \$6,000, whichever is greater but not to exceed actual closing costs. In addition, the proposal would narrow the definition of closing costs.¹⁵ The FHA Emergency Fiscal Solvency Act of 2012 (H.R. 4262), which passed the House of Representatives in 2012, would authorize FHA to increase insurance premiums and punish lenders for misrepresentation or fraud, including the authority to require lenders to pay back claims on insured loans and to cancel lender approval to originate or underwrite future loans. Pinto (2012) proposed adopting practices from the VA mortgage insurance program, including reducing FHA’s insurance coverage from its current 100 percent, using an appraisal board, and examining residual income in addition to debt-to-income ratios.

The future of FHA depends on these regulatory changes but also on broader housing market reforms, particularly the definition and regulation of QRM standards required by the Dodd-Frank Wall Street Reform and Consumer Protection Act and the nature of the secondary market after the GSEs.

Authors

Roberto G. Quercia is the Director of the UNC Center for Community Capital and Chair of the Department of City and Regional Planning at The University of North Carolina at Chapel Hill.

Kevin A. Park is a graduate research assistant at the UNC Center for Community Capital and a doctoral candidate in the Department of City and Regional Planning at The University of North Carolina at Chapel Hill.

¹⁵ See “Federal Housing Administration (FHA) Risk Management Initiatives: Revised Seller Concessions.” *Federal Register* 77 (36) February 23, 2012, 10695–10707.

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Spatial Weight Matrices and Their Use As Baseline Values and Location-Adjustment Factors in Property Assessment Models

Carmela Quintos

Department of Finance, City of New York

The views expressed in this paper are those of the author and do not necessarily reflect the views of the City of New York (NYC) or the NYC Department of Finance.

Abstract

Property assessment models, for the purpose of mass appraisal and taxation, estimate the market price of real estate as a function of its location and physical characteristics. Locational effects, which affect multiple properties in an area, typically are established separately from property-specific effects. Baseline prices are established based on neighborhood or boundary demarcations, then a regression framework gives the adjustments to this baseline based on property-specific characteristics. As an alternative, baseline prices based on physical characteristics are first established, then location adjustments are applied as factors in the regression. This article shows how the spatial weight matrix in a spatial lag regression can be used as either a locational baseline value or as a location-adjustment factor, depending on the model specification.

Introduction

Several factors affect the value of real estate, with location known to be primary. Estimating locational effects on value, particularly in the area of mass appraisal, is done in a regression framework with proxy measures for location. Before the use of geographic information systems (GISs), locational effects were included in the model using variables that delineate neighborhoods, districts, or submarkets, either judged to be distinct or shown to be different using statistical techniques that analyze patterns of demography, crime, social trends, and other characteristics.

The introduction of GISs allowed for spatial relationships and distance-based variables to be included in the regression. One popular approach is to run the regression without locational effects and use GISs on the residuals to develop location-adjustment factors (Gallimore, Fletcher, and Carter, 1996; McCluskey et al., 2000). Surface-fitting techniques such as inverse distance weighted, spline, or kriging are used to construct a residual surface. Because residuals denote overprediction and underprediction, the GIS estimates of the surface are used to adjust for the overvaluation and undervaluation of a property within the area to estimate a location-influence variable. This variable is then included as a location-adjustment factor in the regression.

The problem with the residual approach is that it assumes the residuals capture no other omitted variables except for location. Thus, the previous approach can be understood more as a method to tighten the fit of the regression than as a latent estimate of location. Another approach, the location value response surface (LVRS) analysis, introduced by O'Connor (1982) and extended and applied to different markets by Eichenbaum (1989, 1985), Eckert, O'Connor, and Chamberlain (1993), O'Connor and Eichenbaum (1988), and Ward, Weaver, and German (1999), estimates the price surface, determines value-influence centers (VICs) using peaks and troughs or "hotspots," calculates distance to these centers, and regresses price on x-y coordinates and the distance to VICs. The ratio of the predicted price to the average estimated price is the local adjustment factor, with a mean of 1. In particular, better locations have a factor of more than 1 and the poorer locations have a factor of less than 1. This estimated location-adjustment variable is included in the hedonic regression of price.

Spatial correlation is taken into account in surface-fitting methods, because neighboring prices weighted by distance are used in the estimation. Spatial lag models, on the other hand, explicitly incorporate a measure of spatial correlation as an autoregressive term in the regression. Spatial econometric methods are developed, discussed, or reviewed in Anselin (1988), Anselin and Bera (1998), Basu and Thibodeau (1998), Dubin (1998), Dubin, Pace, and Thibodeau (1999), Kelejian and Prucha (1998, 1999), and Kelejian and Robinson (1993, 1995) and have been applied to different fields in the social sciences. Testing and correcting for spatial correlation in hedonic pricing models are widely used practices in econometric applications.

This article combines both techniques by illustrating how the spatial lag term can be normalized to work as a location-adjustment factor in the LVRS framework. The spatial term is similar to the LVRS analysis in that it is constructed from neighboring prices weighted by distance. Because the inclusion of spatial lags eliminates or reduces spatial correlation in the residuals, the spatial lag

term has high explanatory power as a latent estimate for location. The article shows that using a normalized spatial lag variable significantly improves the fit of predicted prices in the additive-multiplicative framework of mass appraisal models.

Hedonic and Spatial Lag Models

In real estate economics, estimating property values from sales prices typically takes the form of hedonic regressions. Hedonic models assume that the item of interest, say property value, can be measured by decomposable characteristics, such as house size, lot square footage, and number of bedrooms. A hedonic regression treats these attributes separately and estimates the contributory value (in the case of an additive model) or elasticity (in the case of a log-linear model) of each attribute.

Estimating property value in terms of prices of sold parcels is specified by a general equation

$$price = \beta_0 (Z_1^{\beta_1} Z_2^{\beta_2} \dots Z_s^{\beta_s}) \exp \left[\sum_{i=1}^n \gamma_i X_i + \sum_{j=1}^m \gamma_j D_j + \varepsilon \right] \quad (1.1)$$

or in its natural log form as

$$\ln price = \ln \beta_0 + \beta_1 \ln Z_1 + \dots + \beta_s \ln Z_s + \sum_{i=1}^n \gamma_i X_i + \sum_{j=1}^m \delta_j D_j + \varepsilon. \quad (1.2)$$

The coefficients $\beta_1 \dots \beta_s$ are elasticities and therefore the variables $Z_1 \dots Z_s$ are continuous variables typically associated with size (house size, land size, and so on). The n coefficients γ measure the growth in price for a unit change in the variable X and are associated with other continuous variables such as age or distance. The m coefficients δ are adjustment factors based on the dummy variables D . The error ε is assumed to be $(0, \sigma_\varepsilon^2 I)$.

Spatial lag models can be interpreted as a specific form of equation 1.1 when errors fail the $iid(0, \sigma_\varepsilon^2 I)$ assumption and are instead spatially correlated. With spatial autocorrelation in the data, hedonic model estimation using ordinary least squares (OLS) regression of equation 1.2 generates inefficient estimates and therefore incorrect test statistics. Spatial autocorrelation occurs when prices in one location are correlated with prices in neighboring locations so that, for neighboring locations i and j , $E(price_i, price_j) \neq 0$ or alternatively $E(\varepsilon_i, \varepsilon_j) \neq 0$.

When the dependent variable exhibits spatial autocorrelation, a spatial lag term is constructed using a weighted average of the values in nearby locations and is added to equation 1.2,

$$\ln price = \ln \beta_0 + \alpha Wy + \beta_1 \ln Z_1 + \dots + \beta_s \ln Z_s + \sum_{i=1}^n \gamma_i X_i + \sum_{j=1}^m \delta_j D_j + u, \quad (2)$$

where α is the coefficient on the spatially lagged variable Wy , W is the weight matrix, and u is $iid(0, \sigma_\varepsilon^2 I)$.

Spatial Lag As Baseline Values

Consider estimating property values for single-family and multifamily homes in the borough of Queens, New York. For the purpose of assessment, single-family homes and multifamily homes with two and three residential units are considered in the same tax class, are assessed similarly,

and are given the same tax rate. Consistent valuation among properties is important, because taxes are based on assessed values. Properties that have the same physical characteristics—for example, identical homes in terms of measurable physical characteristics such as square footage, number of bedrooms, land size, age, and so on—and are in similar locations—for example, are on the same block—must be given the same value. This requirement means that the spatial lag term Wy , which is a weighted average of neighboring prices, must be measured in the unit where consistency must be achieved. In this case, this level is assumed to be the block level, so that Wy is the weighted average of prices of neighboring blocks. The block level is the smallest unit required for consistency. Areas typically are groups of blocks, districts, or neighborhoods.

Thus, a parcel k in block l is described by rewriting equation 2 at the parcel level,

$$\begin{aligned} \ln price_{kl} &= \alpha Wy_l \\ &+ \left\{ \ln \beta_0 + \sum_{g=1}^s \beta_g \ln Z_{gkl} + \sum_{i=1}^n \gamma_i X_{i,kl} + \sum_{j=1}^m \delta_j D_{j,kl} \right\} \\ &+ u_{kl} \\ \Rightarrow & \text{block baseline price} + \text{parcel physical characteristics} + \text{error}. \end{aligned} \tag{3}$$

Using equation 3 means all parcels in the same block l have the same base price based on neighboring blocks and, for each parcel k within this block, the base price is adjusted for individual characteristics. If a block consists of identical homes (say, a row of brownstones), then the physical characteristics are identical and will adjust the baseline block price similarly. Thus, all identical homes in the same block will be priced the same.

We estimate equation 3 for Queens. Block x and y coordinates are used to compute the spatial lag term Wy . The dataset consists of 8,156 parcels sold between the first quarter of 2010 and the second quarter of 2012. Sales data are compiled by the Department of Finance, City of New York and are published on its website. Data were cleaned for non-arms-length transactions; in particular, they were cleared of foreclosure sales, sales in which one party was a public entity, sales in which one party was a financial institution, sales that indicated a transfer between relatives, and sales that transferred more than once within 1 year. The data were restricted to the borough of Queens because it has the greatest number of homes among the five boroughs of the City of New York.

Time-Trend Adjustment

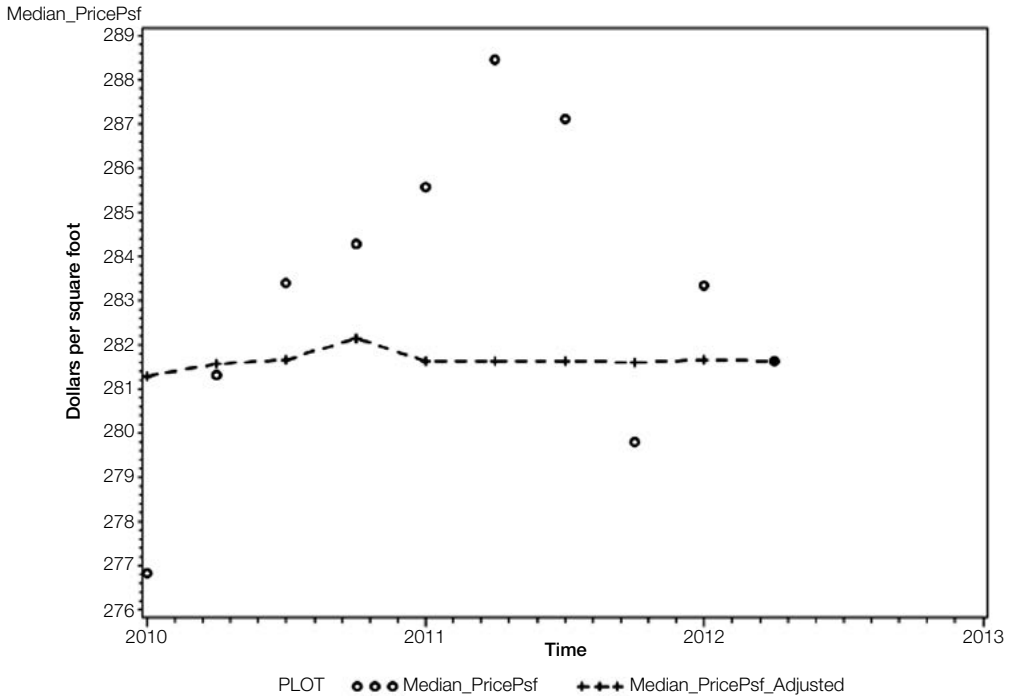
Because sales occurred during different periods, a trend must be accounted for before creating spatial lags. A time-trend regression of the log of price per square foot ($\ln psf$) on quarterly dummies was run to detrend the data to the end of period,

$$\ln psf = \alpha + \beta_i * \sum_{i=1}^q qt_i + \epsilon, \tag{4}$$

where qt are the time dummies excluding the second quarter of 2012 as the base period. The median price per square foot (psf) and the time-adjusted median are plotted in exhibit 1. The dots are the actual median price psf across time, and the line shows that the time-adjusted median price psf is now stable or detrended around the base period's median of \$281.64.

Exhibit 1

Median Price



Psf = per square foot.

Note: Prices were detrended to second quarter of 2012 level.

Spatial Lag Regression

The map in exhibit 2 displays the time-adjusted price psf and shows that a sufficient number of sales are spread out across the borough of Queens. A stepwise regression was run to determine the significant physical characteristics. The result of the stepwise regression in exhibit 3 is labeled OLS. The dependent variable is the log of detrended price psf ($\ln\text{pricepsfadj}$), the independent variables are log of square footage of living area ($\ln\text{sfla}$), log of land area ($\ln\text{land_area}$), garage square footage (gar_sqft), age since alteration (altage), number of stories (stories), and dummy variables of whether the property has a basement (basement), whether it is a two-family or three-family home, its style (row , cape_cod , conventional , old_style), and exterior construction (alum_vinyl , composition , frame).

The adjusted R-square and the coefficient of dispersion (COD) are measures of fit for our regressions. The COD is used to measure uniformity in assessments. If we denote the error in the regression by the ratio of predicted to actual sales, then the COD measures the average departure or deviation of this calculated ratio at around 1. A high COD suggests a lack of equality and uniformity among individual assessments. For residential properties, the maximum allowable COD is 15 percent.

Exhibit 2

Spatial Distribution of Price per Square Foot in Queens, New York



The COD of the OLS regression is more than 15 percent and its adjusted R-square is low, at 45.68 percent. We did a test for spatial correlation on the OLS residuals using Moran's I. The value of Moran's I on the slope coefficient of the lagged residual was 0.596 with a t-statistic of 101, indicating the presence of spatial correlation.

To correct for spatial correlation, we added a spatial lag term based on neighboring blocks. The weight matrix was determined based on which spatial regression had the best COD and adjusted R-square. We did a k nearest neighbor estimate, starting with $k = 5$ to $k = 20$, and a minimum distance estimate using 2,354 feet as its threshold (about three New York City blocks). The results are in exhibit 3. Our final regression uses the minimum distance estimator because it has the best COD and R-square and its median ratio is closest to 1. The final regression model drops the insignificant variable (basement) and is given in exhibit 4, together with a fit plot of the predicted versus actual sales price.

Exhibit 3

Regression Models

dependent variable = lnpricepsfadj

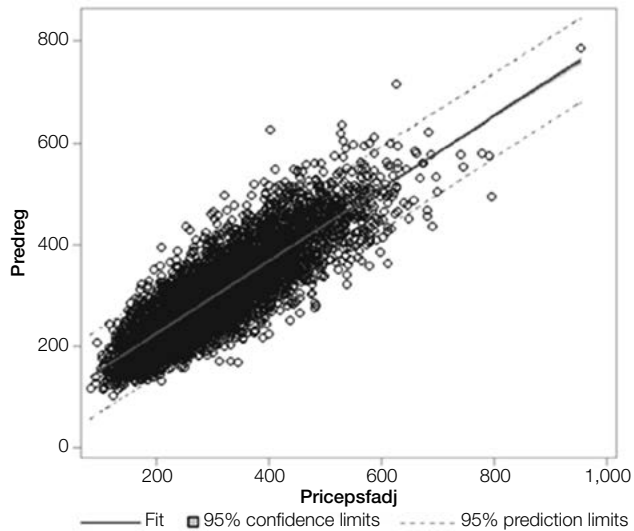
		Spatial Regressions																	
		OLS			k = 5			k = 10			k = 15			k = 20			Min Dist 2,354 ft		
Variable	Parameter Estimate	Pr > t	Parameter Estimate	Pr > t	Parameter Estimate	Pr > t	Parameter Estimate	Pr > t	Parameter Estimate	Pr > t	Parameter Estimate	Pr > t	Parameter Estimate	Pr > t	Parameter Estimate	Pr > t	Parameter Estimate	Pr > t	
Adj R-Sq	45.68%	< .0001	4.71724	< .0001	4.56173	< .0001	4.44707	< .0001	4.37964	< .0001	4.32244	< .0001	4.32244	< .0001	4.32244	< .0001	4.32244	< .0001	71.58%
COD	19.81%	< .0001	-0.56583	< .0001	-0.5893	< .0001	-0.60306	< .0001	-0.61368	< .0001	-0.64323	< .0001	-0.64323	< .0001	-0.64323	< .0001	-0.64323	< .0001	13.84%
Median ratio	0.98872	< .0001	0.12651	< .0001	0.11731	< .0001	0.11981	< .0001	0.12199	< .0001	0.12235	< .0001	0.12235	< .0001	0.12235	< .0001	0.12235	< .0001	0.99271
			0.00041569	< .0001	0.00017944	< .0001	0.00016363	< .0001	0.0001572	< .0001	0.00015271	< .0001	0.00015271	< .0001	0.00015271	< .0001	0.00015271	< .0001	
			-0.000045772	0.0013	-0.000031581	0.0026	-0.00028551	0.0061	-0.00033386	0.0012	-0.00041541	< .0001	-0.00041541	< .0001	-0.00041541	< .0001	-0.00041541	< .0001	
			0.05046	< .0001	0.03518	< .0001	0.03844	< .0001	0.03686	< .0001	0.04059	< .0001	0.04059	< .0001	0.04059	< .0001	0.04059	< .0001	
			0.07023	< .0001	0.0076	0.5325	0.00561	0.6389	0.00763	0.5172	0.00937	0.4252	0.00937	0.4252	0.00937	0.4252	0.00937	0.4252	
			0.01455	0.0274	0.07053	< .0001	0.07942	< .0001	0.08656	< .0001	0.08881	< .0001	0.08881	< .0001	0.08881	< .0001	0.08881	< .0001	
			0.05368	0.0001	0.11642	< .0001	0.12917	< .0001	0.13979	< .0001	0.14807	< .0001	0.14807	< .0001	0.14807	< .0001	0.14807	< .0001	
			-0.0773	< .0001	-0.03732	< .0001	-0.03736	< .0001	-0.03711	< .0001	-0.03403	< .0001	-0.03403	< .0001	-0.03403	< .0001	-0.03403	< .0001	
			-0.12532	< .0001	-0.06046	< .0001	-0.05317	< .0001	-0.04727	< .0001	-0.0466	< .0001	-0.0466	< .0001	-0.0466	< .0001	-0.0466	< .0001	
			-0.10738	< .0001	-0.03847	< .0001	-0.03101	< .0001	-0.02511	< .0001	-0.02171	< .0001	-0.02171	< .0001	-0.02171	< .0001	-0.02171	< .0001	
			-0.09653	< .0001	-0.0569	< .0001	-0.06255	< .0001	-0.05679	< .0001	-0.04918	< .0001	-0.04918	< .0001	-0.04918	< .0001	-0.04918	< .0001	
			-0.06278	< .0001	-0.06217	< .0001	-0.06295	< .0001	-0.06393	< .0001	-0.05639	< .0001	-0.05639	< .0001	-0.05639	< .0001	-0.05639	< .0001	
			-0.09186	< .0001	-0.04308	< .0001	-0.04354	< .0001	-0.04182	< .0001	-0.03924	< .0001	-0.03924	< .0001	-0.03924	< .0001	-0.03924	< .0001	
			-0.11756	< .0001	-0.05392	< .0001	-0.05353	< .0001	-0.04846	< .0001	-0.04035	< .0001	-0.04035	< .0001	-0.04035	< .0001	-0.04035	< .0001	
					0.72698	< .0001	0.79647	<.00	0.85175	< .0001	0.82811	< .0001	0.85175	< .0001	0.85175	< .0001	0.89742	< .0001	

Adj R-Sq = adjusted R-square. COD = coefficient of dispersion. OLS = ordinary least squares.

Exhibit 4

Final Regression Model and Predicted Regression (predreg) Versus Actual Sale Price

Spatial Regression		
dependent variable = lnpricepsfadj		
Adj R-Sq	71.59%	
COD	13.84%	
Median ratio	0.9924	
Variable	Parameter Estimate	Pr > t
Intercept	4.32723	< .0001
lnsfla	- 0.64291	< .0001
lnlnd_area	0.12232	< .0001
gar_sqft	0.0001512	< .0001
altage	- 0.0004109	< .0001
stories	0.03991	< .0001
two_family	0.0887	< .0001
three_family	0.14735	< .0001
frame	- 0.03375	< .0001
alum_vinyl	- 0.04664	< .0001
composition	- 0.02167	0.0007
row	- 0.04892	< .0001
cape_cod	- 0.05616	< .0001
conventional	- 0.03925	0.0002
old_style	- 0.03973	0.0001
ln_spatial_lag	0.89792	< .0001



Observations	8,156
Parameters	2
Error DF	8,154
MSE	1,774.4
R-square	0.7308
Adj R-square	0.7308

Adj R-Sq = adjusted R-square. COD = coefficient of dispersion. DF = degrees of freedom. MSE = mean square error.

Spatial Lag As Location Adjustments

An alternative and commonly used approach to property valuation is using an additive model to establish a base price based on contributory value, then using the multiplicative model (log-linear model) to apply adjustments to the estimated base price. Using our final model in the previous section, the first regression would be specified as

$$price = \beta_1 * landarea + \beta_2 * sfla + v, \tag{5}$$

where *sfla* is the square feet of living area and the dependent variable is time-adjusted price. Note that the regression is in price level, not in price psf, so that the coefficient β measures the dollar contribution of an additional square foot of land or building. The intercept is also suppressed to ensure positive prices. Properties that are identical in size and land area have the same base price regardless of location, exterior finish, age, and so on.

Adjustments to the base price for location, age, and finish are estimated in a log-linear framework. Let \hat{price} denote the estimated price in equation 5, then adjustments to this base price are modeled as in equation 1.1,

$$price = \beta_0 \left(\hat{price} \right) \exp \left[\sum_{i=1}^n \gamma_i X_i + \sum_{j=1}^m \gamma_j D_j + \varepsilon \right], \tag{6.1}$$

or alternatively as in equation 1.2 in log form,

$$\ln Price = \ln \beta_0 + \beta_1 \ln \hat{price} + \sum_{i=1}^n \gamma_i X_i + \sum_{j=1}^m \delta_j D_j. \quad (6.2)$$

The spatial lag estimated in the previous section can be used as a location-adjustment factor in equation 6.2. Take the median of the spatial lag term for the whole borough and use it as a normalizing factor. For parcel k in block l , define its location adjustment as

$$locadj_{kl} = \frac{Wy_l}{\text{median}(Wy_1, \dots, Wy_n)}, \quad (7)$$

where n is the total number of blocks. Then $locadj_{kl}$ is a ratio that is applied to increase or decrease the base price \hat{price} . Values greater than 1 indicate locations that are priced higher than the borough median and, similarly, values that are less than 1 are in sale areas with values lower than the borough median.

Exhibit 5 contains the regression specification (equation 6.2) using the variables in the previous section. The dependent variable is the log of adjusted price ($\ln price_{sfadj}$); the independent variables are log of the estimated base price ($\ln_basePrice$), log of square footage of living area ($\ln sfla$), log of land area ($\ln lnd_area$), garage square footage (gar_sqft), age since alteration ($altage$), number

Exhibit 5

Location-Adjustment Model

dependent variable = $\ln price_{sfadj}$

	OLS		Spatial/Location Adjustment	
Adj R-Sq	40.42%		68.68%	
COD	19.83%		13.89%	
Median ratio	0.98898		0.99159	
Variable	Parameter Estimate	Pr > t 	Parameter Estimate	Pr > t
Intercept	6.35184	< .0001	6.62847	< .0001
$\ln_basePrice$	0.52326	< .0001	0.48516	< .0001
gar_sqft	0.00041075	< .0001	0.00016903	< .0001
$altage$	- 0.0004085	0.0042	- 0.00040783	< .0001
stories	0.04113	< .0001	0.04733	< .0001
two_family	0.00694	0.2646	0.10106	< .0001
three_family	0.01786	0.1775	0.15487	< .0001
frame	- 0.06867	< .0001	- 0.04571	< .0001
alum_vinyl	- 0.12631	< .0001	- 0.04532	< .0001
composition	- 0.10805	< .0001	- 0.01771	0.0058
row	- 0.09928	< .0001	- 0.01946	0.0845
cape_cod	- 0.06271	< .0001	- 0.07669	< .0001
conventional	- 0.08499	< .0001	- 0.02028	0.0558
old_style	- 0.1047	< .0001	- 0.0226	0.0292
\ln_locadj			0.88468	< .0001

Adj R-Sq = adjusted R-square. COD = coefficient of dispersion. OLS = ordinary least squares.

of stories (stories), and dummy variables of whether it is a two-family or three-family home, its style (row, cape_cod, conventional, old_style), and exterior construction (alum_vinyl, composition, frame). The location adjustment is the variable *ln_locadj*. The addition of the location-adjustment factor significantly increases the adjusted R-square to 68.68 percent and decreases the COD to 13.89 percent.

Summary

This article showed how spatial lags can be incorporated into property assessment models. We presented two methods in which spatial lags can be used: first, as a base price established by location (blocks, districts, neighborhoods) and, second, as a location-adjustment factor. The choice of which specification to use depends on the objective and use of the models. For the case in which total value is of interest, such as in assigning estimated prices to unsold properties or microstudies and macrostudies of market trends, then the spatial lag model is sufficient. For cases in which contributory values are required, such as in valuing new properties or estimating the addition of square footage of buildings in progress, then the second approach is applicable. In each case, the use of spatial lags improves the model fit significantly.

Author

Carmela Quintos is Director of the Property Modeling Group at the Department of Finance, City of New York.

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Using Near-Repeat Analysis To Measure the Concentration of Housing Choice Voucher Program Participants

Ron Wilson

U.S. Department of Housing and Urban Development
University of Maryland, Baltimore County

The views expressed in this article are those of the author and do not represent the official positions or policies of the Office of Policy Development and Research or the U.S. Department of Housing and Urban Development.

Abstract

Public housing authorities (PHAs) are often concerned about housing voucher recipients' reconcentrating after entering the Section 8 voucher program. I use a near-repeat analysis method in this analysis for Dallas, Texas, to test whether new voucher recipients concentrate and, if so, how quickly. The results reveal that new recipients do locate in close proximity to each other at a steady pace over time. PHAs can use this method and subsequent results to measure the progress of deconcentration plans and to help new housing voucher recipients make more informed choices about where to locate.

Housing Choice Vouchers, Deconcentration Plans, and Monitoring Mobility

The Housing Choice Voucher Program (HCVP) provides low-income families the opportunity to move out of impoverished neighborhoods and relocate to better neighborhoods with greater economic opportunity.¹ A common concern for local PHAs about the freedom HCVP offers, though,

¹ In 2010 alone, approximately 2.1 million families received assistance through HCVP. (Public & Indian Housing Tenant-based Rental Assistance: 2012 Summary Statement and Initiatives, 2010) http://portal.hud.gov/hudportal/documents/huddoc?id=Tenant_BR_Assis_2012.pdf.

is that participants will reassemble in the same neighborhoods and potentially undo efforts to de-concentrate poverty, which could lead to the emergence of a range of social and economic problems (Ellen, Lens, and O'Regan, 2012; Freeman and Botien, 2002; Mast and Wilson, 2013; Pendall, 2000; Popkin, et. al., 2012; Wilson and Mast, 2013). In addition, PHAs are concerned that voucher holders will reconcentrate in neighborhoods and be exploited by landlords. For example, landlords could set higher rents than average because rents for nearby properties become uniform. Landlords might not maintain properties to maximize profits because residents are unlikely to organize and demand better conditions. Further, lack of property upkeep can lead to neighborhood blight and deter additional investment, which ultimately leaves voucher recipients with diminished economic opportunities.

Many PHAs develop plans to measure and monitor poverty deconcentration, but these plans are primarily aimed at public housing developments.² Rules set forth by Title 24, Part 903 of the Code of Federal Regulations³ list a number of factors PHAs must measure in their plans to ascertain whether public housing developments are achieving poverty deconcentration; several of the factors require identifying geographic areas to evaluate change. Many plans include the use of vouchers as a mechanism to facilitate poverty deconcentration because participants relocate out of public housing developments altogether (Huartung and Henig, 1997) and into other neighborhoods with mixed income levels. Given the geographic nature of mobility, spatial analysis tools can be used to assess if HCVP participants are reconcentrating or dispersing. By using an approach that incorporates time into the spatial analysis, PHAs can determine not only if voucher holders are reconcentrating, but also how fast they are co-locating with other HCVP participants. Results may also be used to examine the neighborhoods where new voucher recipients are co-locating to gain an understanding of their mobility choices or garner an idea of how likely other voucher holders are to move into areas where other participants have relocated.

I demonstrate in this article how to perform a near-repeat analysis to geographically measure the speed at which new HCVP participants concentrated when they entered the HCVP between 2007 and 2010 in the Dallas-Arlington-Fort Worth, TX metropolitan area. I used 13,788 new HCVP participant admission locations from the Public and Indian Housing (PIH) Inventory Management System (IMS)/PIH Information Center (PIC) databases.⁴ The results depict the likelihood that new HCVP recipients will co-locate in proximity to each other and the speed with which they co-locate. I extend the analysis by identifying relocation density clusters that reveal the least and greatest relocation concentration.

The Near-Repeat Concept

A near-repeat analysis is an approach used in measuring the spatial and temporal relationships of crime. Research indicates that crime incidents can occur at the same location (repeat) or nearby

² An Internet search with terms similar to “public housing deconcentration plans” yields a number of web addresses that link to existing plans established all over the United States.

³ 24 CFR 903, “Public Housing Agency Plans.” Available at <http://www.gpo.gov/fdsys/granule/CFR-2011-title24-vol4/CFR-2011-title24-vol4-part903/content-detail.html>.

⁴ http://portal.hud.gov/hudportal/HUD?src=/program_offices/public_indian_housing/systems/pic.

(near repeat) in short periods of time from each other (Bowers and Johnson, 2004; Johnson, Bowers, and Hirshfield, 1997; Ratcliffe and Rengert, 2008; Short et al., 2009). These repeats occur because the areas in which the incidents occur share location commonalities that offer opportunities for crime. The near-repeat concept is rooted in the First Law of Geography (Miller, 2004) that everything is related, but things close in proximity share a stronger relationship because they share common characteristics; *that is*, the events are spatially dependent based on proximity. The near-repeat approach capitalizes on this law by incorporating the temporal sequencing of event locations that occur within a series of increasing distances between events. Housing and urban problems readily lend themselves to this type of analysis because many problems exhibit spatial dependence between events and the urban landscapes.

Identifying Distance and Time Intervals To Set Near-Repeat Parameters

I first identified meaningful distance and temporal intervals in which new voucher admissions are expected to concentrate. Too large or small an interval can introduce measurement error from including or excluding too many locations within an interval. For the distance intervals I conducted a nearest neighbor (NN) analysis on all new admission locations to determine if vouchers were clustering. The NN analysis indicated that new voucher admissions were highly clustered with an index of 0.1417 ($z = -189.27$).⁵ The average distance between new admission locations was 318.49 feet with a standard deviation of 1,760.21 feet. These results indicate that new HCVP participants co-locate very close to each other. I used approximately 0.33 miles (one standard deviation above the mean distance between locations) up to 4.00 miles to account for an HCVP participant to select a rental property across an area containing several neighborhoods.

Temporal intervals also need to be based on a meaningful timeframe. As with distance intervals, too large or small of a time interval will also introduce more measurement error. I used 30-day time intervals of up to 180 total, because the voucher admission process follows a series of monthly administrative stages to obtain a voucher and the relocation notification laws typically require 30 days' notice to move between residences.

Near-Repeat Calculations of New HCVP Admission Locations in the Dallas, Fort Worth, and Arlington, Texas Metropolitan Area

I used the near-repeat calculator (NRC)⁶ to simultaneously measure the distance and time characteristics between new voucher locations. The NRC expands the original concept by George Knox (1964) who derived a statistical test that categorizes a pair of event locations in a 2 x 2 contingency

⁵ A nearest neighbor analysis produces an index, which is a ratio of the observed and expected average distances. The index ranges in value from 0 to 2.149, with a balance point of 1.0. Values closer to 0 indicate clustering. Values around 1.0 indicate a random distribution. Values closer to 2.149 indicate dispersion.

⁶ <http://www.temple.edu/cj/misc/nr/>.

table⁷ in which two events occur in close proximity by (1) distance only (d_1, t_0), (2) time only (d_0, t_1), (3) both distance and time (d_1, t_1), or (4) not proximal in either (d_0, t_0). The NRC extends the Knox contingency table by creating an $N \times N$ contingency table with multiple distance and time intervals—from d_1 to d_n and t_1 to t_n —instead of just two intervals for each dimension (exhibit 1).

In addition, the NRC tests for repeat events at the same location, which distance is denoted d_0 , and time t_0 . The NRC measures and records the distances between all observed pairs of event locations and their date stamps for each specified distance and time interval. A Monte Carlo permutation approach is then employed to randomize only the event dates. The permutation process is carried out for each distance and time interval separately, up to 999 randomization trials.⁸ For each trial, the event pairs' distances are remeasured with the reassigned dates and combined with the other trial results to create an expected (null) distribution. Locations remain fixed during the permutation process because the date randomization redefines the spatial relationship between locations, such that two locations may or may not be in proximity to each other within a time interval. The observed event pair-count is then compared with the mean of the expected distribution to determine if the actual number of nearby event locations is different than the expected in a time interval (exhibit 2).

Statistical significance for each distance and time interval is determined by calculating the number of times the observed event pair-count exceeds the mean of the expected distribution. If the observed count is outside the expected distribution, then the distance-time relationship between a pair of observations is likely due to some underlying process and not by chance.

I used a .01-significance level for the Monte Carlo tests to ensure my results were robust and to distinguish levels of statistical strength for each distance-time interval.⁹ I measured new admission

Exhibit 1

$N \times N$ Knox Contingency Table To Test Distance and Time Relationships

	0 → Time intervals → t						
Distance intervals	0	D1 & T1	D1 & T2	D1 & T3	...	D1 & TN	~T for D1
		D2 & T1	D2 & T2	D2 & T3	...	D2 & TN	~T for D2
		D3 & T1	D3 & T2	D3 & T3	...	D3 & TN	~T for D3
	
		DN & T1	DN & T2	DN & T3	...	DN & TN	~T for DN
	d	~D for T1	~D for T2	~D for T3	...	~D for TN	~T & ~D

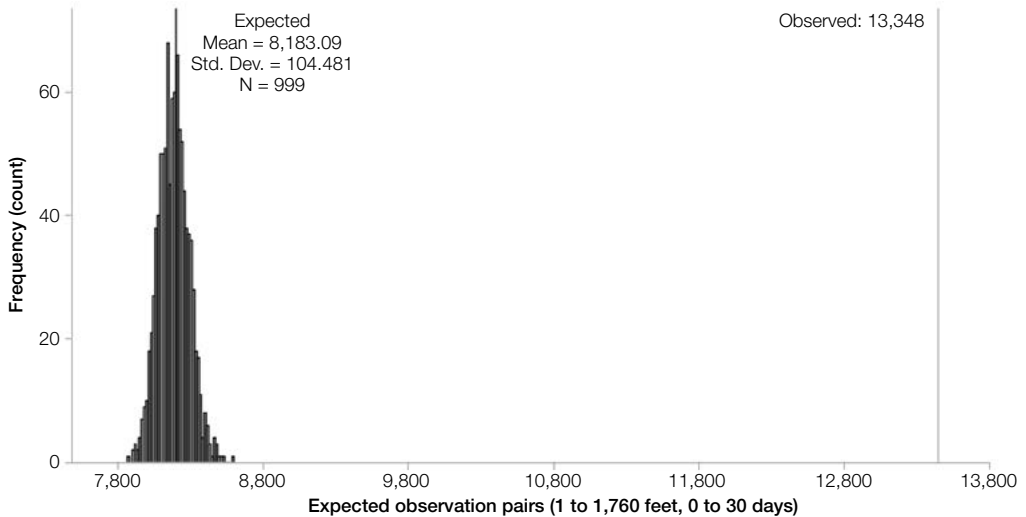
⁷ A contingency table in this context is a matrix of two or more categories that depict the relationship between each factor across all rows and columns.

⁸ The number of randomization trials is based on a selected level of significance to be achieved: $p \leq .5$: 19 randomizations; $p \leq .01$: 99 randomizations; $p \leq .001$: 999 randomizations.

⁹ Running a near-repeat analysis with significance levels at $p \geq .01$ or $p \geq .01$ with the NRC produces results that show which observed distance and time interval observed and expected ratios are the strongest and weakest based on which significance level was selected.

Exhibit 2

Distribution of Expected Pairs Within Second Distance and First Time Intervals



N = number. *Std. Dev.* = standard deviation.

locations with direct distances (Euclidean), because concentrations of new voucher admissions are about the direct proximity of one family to another in an area and do not have to follow a gridded street pattern (Manhattan) to be in proximity.

The NRC produces two contingency tables. The first table reports the likelihood ratios (Knox ratios)¹⁰ of events repeating at the same location or repeating nearby within a certain proximity (exhibit 3).

Ratios of less than 1 indicate new voucher admissions are less likely to occur. Ratios greater than 1 indicate foreclosures are more likely to occur. For example, from exhibit 2, 8,183 new voucher admission counts are expected to occur within 1 to 1,760 feet of each other and within 0 to 30 days of each other, with the observed pair-count being 13,348 new admissions.¹¹ Dividing the observed pair-count by the expected number of new admissions creates a Knox ratio of 1.63 and indicates a 63 percent (Knox ratio minus 1) chance that another new voucher recipient will relocate within approximately 0.33 miles (1,760 feet), within 0 to 30 days, from an initial new admission location. Knox ratios in bold, black numbers are significant at .01 and bold, light-gray numbers are significant at .05—all small, unbold, light-gray numbers are not significant.

The second table reports significance levels for each corresponding Knox ratio (exhibit 4). Statistical significance is determined by calculating *p*-values from the observed and expected pair-count comparison. *p*-values are calculated for each distance and time interval with $p = 1 - n_e / (n_s + 1)$, where n_e is the Knox ratio and n_s is the number of randomization trials. For example, with new voucher admission locations that occur within 1 to 1,760 feet, within 0 to 30 days, the *p*-value for

¹⁰ For a more detailed discussion of Knox ratios, see Grubestic and Mac (2008).

¹¹ The observed and expected counts are reported in another table produced by the NRC, which is titled “Verbose.”

Exhibit 3

Observed Over Mean Expected Values for Near-Repeat HCVP Voucher Admission Locations, 2010

	0 to 30 Days	31 to 60 Days	61 to 90 Days	91 to 120 Days	121 to 150 Days	151 to 180 Days	More Than 180 Days
Same location	6.04	3.61	2.51	1.84	1.19	0.99	0.43
1 to 1,760 feet	1.63	1.41	1.54	1.48	1.48	1.37	0.85
1,761 to 3,520 feet	1.21	1.17	1.11	1.00	0.99	0.96	0.97
3,521 to 5,280 feet	1.36	1.26	1.15	1.06	0.98	0.90	0.96
5,281 to 7,040 feet	1.24	1.17	1.13	1.05	1.02	0.96	0.97
7,041 to 8,800 feet	1.28	1.25	1.13	1.07	1.01	0.95	0.96
8,801 to 10,560 feet	1.29	1.22	1.10	1.04	1.04	0.95	0.96
10,561 to 12,320 feet	1.21	1.14	1.09	1.04	1.01	0.99	0.97
12,321 to 14,080 feet	1.25	1.17	1.14	1.07	1.03	1.04	0.96
14,081 to 15,840 feet	1.23	1.14	1.08	1.02	0.99	0.98	0.97
15,841 to 17,600 feet	1.20	1.14	1.08	1.03	0.99	1.01	0.97
17,601 to 19,360 feet	1.17	1.11	1.07	1.04	1.01	1.02	0.98
19,361 to 21,120 feet	1.29	1.18	1.12	1.10	1.04	1.04	0.96
More than 21,120 feet	0.98	0.99	0.99	1.00	1.00	1.00	1.00

HCVP = Housing Choice Voucher Program.

Notes: Bold, black values are statistically significant at $p \leq .01$. Bold, light-gray values are statistically significant at $p \leq .05$. Small, unbold, light-gray values are not statistically significant.

Exhibit 4

Significance Values for Near-Repeat HCVP Voucher Admission Locations, 2007 to 2010

	0 to 30 Days	31 to 60 Days	61 to 90 Days	91 to 120 Days	121 to 150 Days	151 to 180 Days	More Than 180 Days
Same location	0.01	0.01	0.01	0.01	0.01	0.70	1.00
1 to 1,760 feet	0.01	0.01	0.01	0.01	0.01	0.01	1.00
1,761 to 3,520 feet	0.01	0.01	0.01	0.45	0.74	1.00	1.00
3,521 to 5,280 feet	0.01	0.01	0.01	0.01	0.94	1.00	1.00
5,281 to 7,040 feet	0.01	0.01	0.01	0.01	0.07	1.00	1.00
7,041 to 8,800 feet	0.01	0.01	0.01	0.01	0.12	1.00	1.00
8,801 to 10,560 feet	0.01	0.01	0.01	0.01	0.01	1.00	1.00
10,561 to 12,320 feet	0.01	0.01	0.01	0.01	0.15	0.77	1.00
12,321 to 14,080 feet	0.01	0.01	0.01	0.01	0.01	0.01	1.00
14,081 to 15,840 feet	0.01	0.01	0.01	0.05	0.95	0.97	1.00
15,841 to 17,600 feet	0.01	0.01	0.01	0.05	0.84	0.18	1.00
17,601 to 19,360 feet	0.01	0.01	0.01	0.01	0.05	0.05	1.00
19,361 to 21,120 feet	0.01	0.01	0.01	0.01	0.01	0.01	1.00
More than 21,120 feet	1.00	1.00	1.00	1.00	1.00	1.00	0.01

HCVP = Housing Choice Voucher Program.

Notes: Bold, black values are statistically significant at $p \leq .01$. Bold, light-gray values are statistically significant at $p \leq .05$. Small, unbold, light-gray values are not statistically significant.

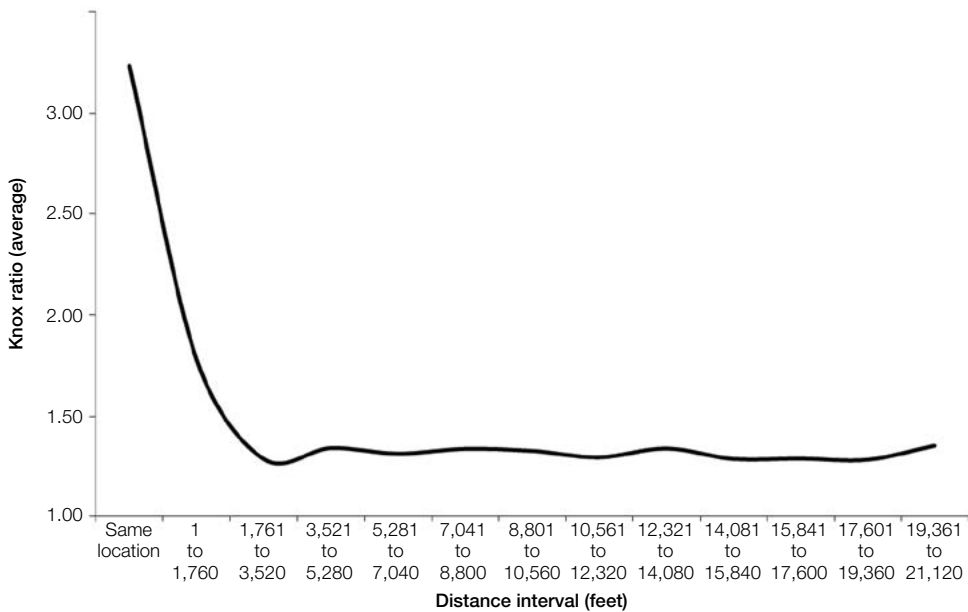
the 1.63 Knox ratio is $p = 1 - 1.63 / (99 + 1)$, evaluating to $p = 0.0063$. This p -value is statistically significant at the .01-level and the likelihood of the 2,856 new admissions being in the closest proximity to each other within the first 0 to 30 days is not due to chance.

Exhibit 3 shows an extensive and ongoing clustering of vouchers across time. The Knox ratios indicate a general pattern of time and distance decay¹² for new HCVP admissions after an originating new admission. Exhibits 5 and 6 summarize exhibit 3.

New admissions appear to have the greatest propensity to move to the same location, which is likely to be a low-income apartment or other multifamily complex. Distance decreases much more rapidly than time for near-repeat admissions, indicating new HCVP participants primarily co-locate in neighborhoods where other vouchers holders already live on a steady basis for about 3 months. In other words, the greatest chances of new participants co-locating are within 5,280 feet (1 mile) and within 90 days of the originator.

Exhibit 5

Distance Decay of New HCVP Participants, 2007 to 2010

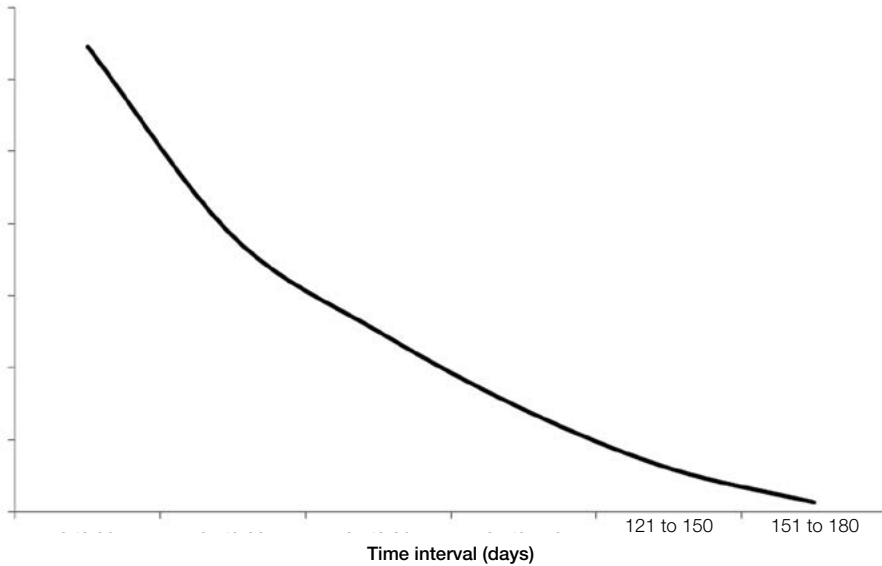


HCVP = Housing Choice Voucher Program.

¹² If spatial analysis is to be conducted later, the plotting of values in a spreadsheet graph will show the distance decay curve that could be used to visualize the appropriate mathematical function to use for distance parameter specification. The shape of the distance decay curve from the results can help in selecting the mathematical function that produces a similar curve to weight distance.

Exhibit 6

Temporal Decay of New HCVP Participants, 2007 to 2010



HCVP = Housing Choice Voucher Program.

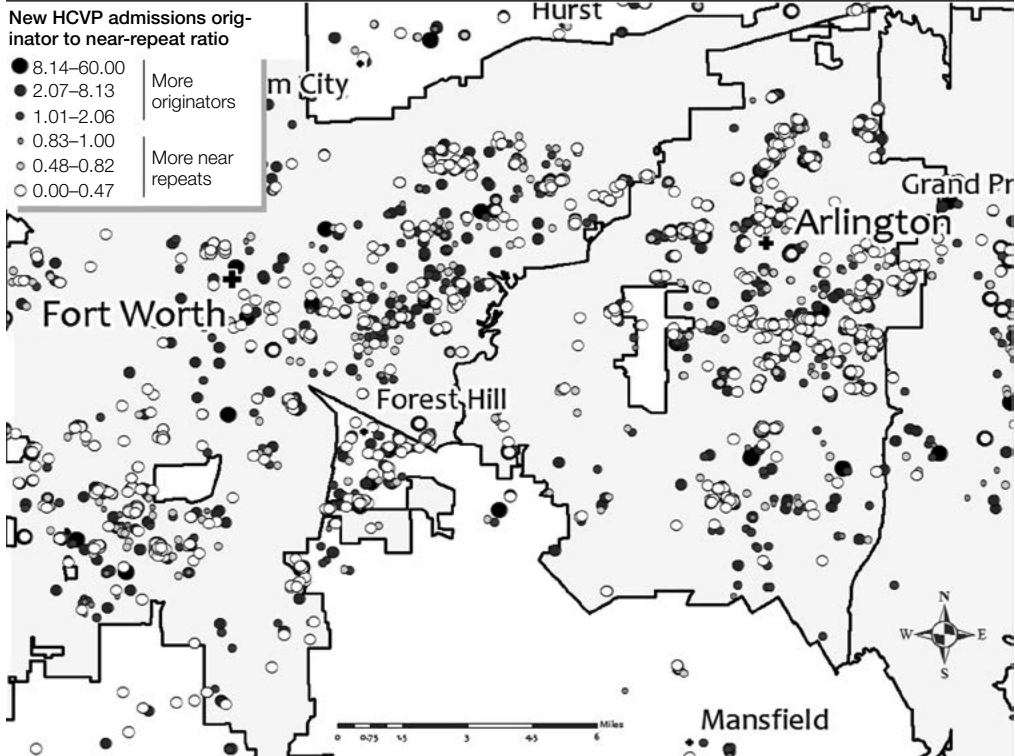
Visualizing the Near-Repeat Calculator Results

The near-repeat calculator can output the number of times an event is an originator location to other nearby locations, and it can output the count of near-repeat events to other locations. This output allows for visualizing the event space-time clusters in a geographic information system, or GIS. The originator and near-repeat quantities can be mapped by individual counts or by combining the number of times a location is an originator and a near repeat into a ratio to show a bivariate relationship. Exhibit 7 shows the ratio of originator voucher admissions for nearby admissions to the near-repeat admissions patterns across the Fort Worth and Arlington areas for up to 4 miles (21,192 feet) and 4 months (120 days), which matches the significance patterns in exhibit 4.

The size of the graduate symbol expresses how many times a new admission is an originator for other new admissions or is a near-repeat admission to other new admission locations. The larger and darker the circles, the more a new admission serves as a clustering source for other (near-repeat) admissions; that is, other new voucher recipients followed the original recipient to the same location or nearby. The larger and lighter the circles, the more times a new admission is a near repeat to other new admissions. The patterns reveal where the clustering trend started—dark circles being the most influential catalysts—and where the expansion occurred (lighter circles) around those original admissions. For example, in the area between Fort Worth and Arlington, several large, black circles with groupings of dark- and light-gray circles are in close proximity. Black circles indicate locations that were originators for a significant number of new voucher admissions within the proximity. The numerous light-gray and white circles indicate the extent of new voucher

Exhibit 7

Ratio of Originator to Near Repeats of New HCVP Admissions, 2007 to 2010



HCVP = Housing Choice Voucher Program.

admissions that are located near originating or other near-repeat admission locations. This visualization is useful for identifying the originating new admission location, and it shows how many near repeats voucher recipients are around the originating admissions and the direction they extend. Clusters of dark circles can signal a gravity effect in which the likelihood of another new admission locating in the general vicinity is strong. Clusters of lighter circles can reveal the extent of near-repeat admissions around other new admissions.

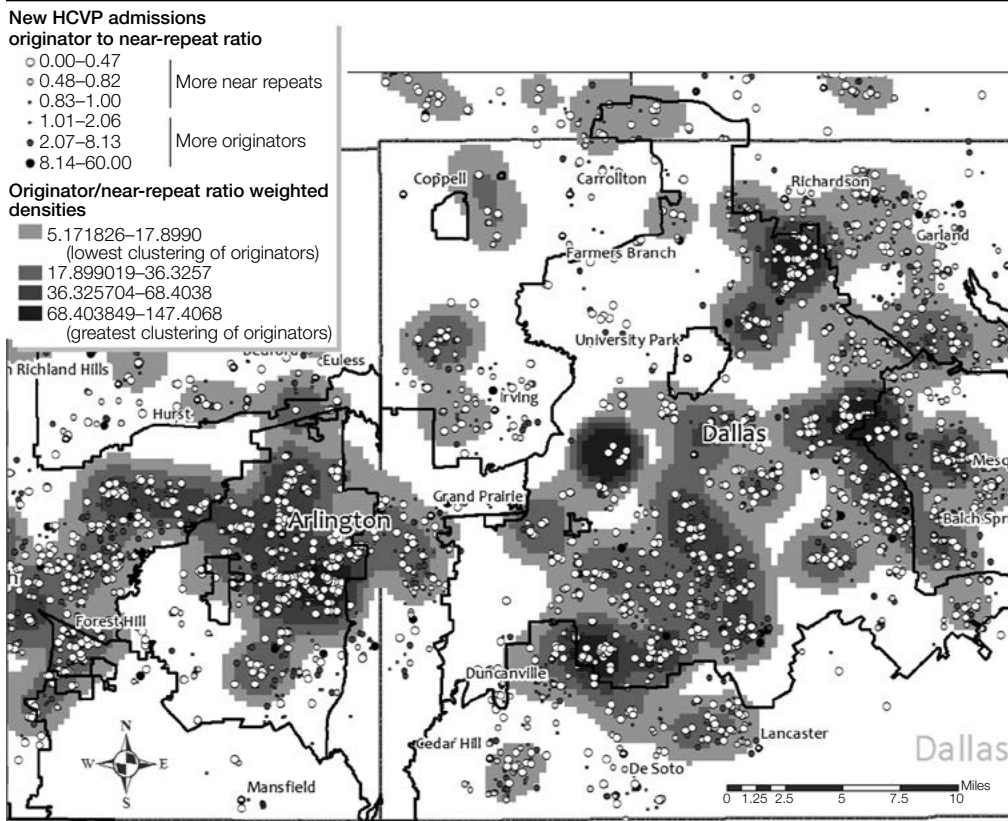
The graduated circles do not accurately depict cluster areas, however, and can be deceiving because their graphic display requires inflated sizes that make them appear closer than they really are. Therefore, density surfaces can enhance the visualization of the near-repeat results because the technique summarizes the proximity of the relationships with a smoothed surface based on the number and proximity of new admission locations. So, to extend the visualization of the near-repeat output, I conducted a kernel density estimation, or KDE, analysis to create a cluster surface of the repeat and near-repeat location output from the NRC. Using CrimeStat IV, I selected the quartic function for this analysis because it weights closer observations more uniformly in close proximity and gradually decreases the weighting subtly—similar to a bubble—the farther the observations are up

to a specified distance.¹³ The quartic function characterizes previous research findings that voucher holders tend to live in close proximity. I also weighted the new admissions' locations based on their originator to near-repeat ratio to emphasize the strength of a location's influence on, or draw to, other locations.¹⁴ Finally, I used relative densities for the output to produce a density surface that represents the number of new voucher holders' relocations per square mile, accounting for an originator to draw other near repeats to the local area.

Exhibit 8 reveals multiple density clusters of varying levels of concentration of new HCVP admissions. The density surface extenuates the near-repeat locations to highlight areas where new HCVP participants are likely to live. These areas vary in densities with the gradients depicting areas with lowest (light gray) to highest (dark gray) densities of new HCVP participants per square mile.

Exhibit 8

Originator to Near-Repeat Ratio Densities (per square mile) of New HCVP Admissions, 2007 to 2010



HCVP = Housing Choice Voucher Program.

¹³ The inclusion of only those observations within the specified distance is true for all the mathematical functions in CrimeStat 3.3 except for the normal function. The normal function includes all observations across the geography.

¹⁴ Values closer to 0 indicated more near repeats to fewer originators, while values beyond 1 indicate the more times an originator is related to other near repeats.

One cluster to the west of downtown Dallas is an area with a number of near-repeat clusters at only a few locations. The cluster pattern indicates that it is a multifamily complex into which many new voucher holders are moving. Four other high-density, near-repeat clusters are present in the north-east, east, and southwest of Dallas, with one in south-central Arlington. Each cluster represents a significant number of near repeats, indicating that many voucher holders are locating to those areas, which may have a number of multifamily complexes and correspond with the higher Knox ratios for the same location in the tables in exhibits 3 and 4.

Monitoring and Planning Considerations

A near-repeat analysis offers a dynamic way to monitor the deconcentration of poverty, because the geographical analysis reveals where clusters of new admission relocations are emerging as time passes, including likelihoods where other voucher holders will relocate. After repeat and near-repeat locations are identified, a number of further visual or spatial analyses can be undertaken, such as comparing the results with income changes in the areas where they are relocating, determining if expansion is occurring into new areas; examining housing market and neighborhood conditions in the areas where new admissions are concentrating or expanding into; or using other spatial statistical techniques to measure mobility.

Specifically with the near-repeat calculator, numerous other ways to analyze data exist, because they can be partitioned along any number of criteria, such as certain areas versus other areas, such as poverty levels or housing submarkets. More specifically, the new voucher admission locations can be partitioned by time periods and analyzed sequentially to compare changes across time. In any analysis, the result of a near-repeat approach could help PHAs monitor deconcentration efforts and it could serve as a complement to analyzing mobility patterns, in general, with a more dynamic approach. This analysis approach can also help voucher holders, in general, make more informed decisions about the neighborhoods to which they may want to relocate.

Acknowledgments

The author thanks Xinhao Wang of the University of Cincinnati and Kirk McClure of the University of Kansas for providing comments toward improving this article.

Author

Ron Wilson is a social science analyst in the Office of Policy Development and Research at the U.S. Department of Housing and Urban Development and an adjunct faculty member of the Geographic Information Systems program at the University of Maryland, Baltimore County.

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