Do Vouchers Help Low-Income Households Live in Safer Neighborhoods? Evidence on the Housing Choice Voucher Program

Michael C. Lens
Ingrid Gould Ellen
Katherine O'Regan
Wagner School and Furman Center, New York University

Abstract

This article examines an important potential justification for the Housing Choice Voucher Program, namely, whether participants are able to access safer neighborhoods. Using neighborhood crime and subsidized housing data for 91 large cities, we examined whether voucher holders are able to reach communities with lower levels of crime. We found that, in 2000, voucher households occupied neighborhoods that were about as safe as those housing the average poor renter household and were significantly safer than those in which households assisted through place-based programs lived. Notably, Black voucher holders lived in significantly lower crime neighborhoods than poor households of the same race, but Hispanic and White voucher holders did not. In a separate analysis of seven cities, we found that voucher holders lived in considerably safer neighborhoods in 2008 than they did in 1998, largely because crime rates fell more in the neighborhoods where voucher holders live than in other neighborhoods.

Introduction

Many scholars have argued that crime rates shape residential decisions and can thereby modify urban form. For example, several researchers have pointed to high rates of urban crime as a contributor to suburban flight (Cullen and Levitt, 1999; Mieszkowski and Mills, 1993). Although some debate exists about how dramatically changes in crime per se can alter the decision about

whether to live in a city versus the suburbs (Ellen and O'Regan, 2010), researchers generally agree that crime is a significant concern for households and can influence households' neighborhood choices. Virtually all of this research has focused on the residential decisions of middle-income households.[1] Lower income households, however, care a great deal about neighborhood crime, too, although they may not have the same means to avoid it. In surveys of both Gautreaux and Moving to Opportunity (MTO) participants, respondents consistently cited crime as a primary motivation for wanting to enroll in those programs and move out of original high-crime neighborhoods (Goering, Feins, and Richardson, 2002; Hanratty, McLanahan, and Pettit, 1998; Rubinowitz and Rosenbaum, 2000).

One key justification for the Housing Choice Voucher Program (vouchers) is to provide assisted tenants with a greater range of neighborhood choices and, hopefully, enable them to reach better—and safer—neighborhoods.[2] Although previous research has examined the extent to which voucher holders reach lower poverty neighborhoods, virtually no work has examined the safety levels of the neighborhoods in which voucher holders live. This article aims to fill that gap.

The public safety risks of living in high-crime environments are substantial. People living in high-crime neighborhoods are more likely to be victims of crime, suffering physical, financial, and psychological harm. Votruba and Kling (2009) estimate that moving to safer neighborhoods saved up to 17 lives for 2,850 participants in the MTO program, with 13 of those lives saved from averted homicides. Moreover, being a witness to violent crime or living in fear of victimization can lead to stress and even diminished performance in school (Garbarino et al., 1992; Sharkey, 2010; Stafford, Chandola, and Marmot 2007). Finally, evidence suggests that youth who grow up in high-crime neighborhoods are disproportionately more likely to begin criminal careers and engage in risky behaviors, such as drug and alcohol use (Case and Katz, 1991; Ellen and Turner, 1997). Indeed, some researchers have argued that the disparate results across MTO sites may be partly explained by variation in crime among these different locations (Burdick-Will et al., 2010).

Clearly, crime is a vital component of neighborhood quality and thus a key outcome of interest in evaluating the efficacy of subsidized housing policies that seek to move program participants to better neighborhoods. This article aims to shed light on this critical dimension of the Housing Choice Voucher Program in cities. Specifically, we address the following questions: (1) How does the safety of the neighborhoods where voucher households live compare with the safety of the neighborhoods where they might have otherwise lived? (2) How does exposure to neighborhood crime vary across different types of voucher households? (3) How has crime exposure changed over time for voucher households? To what extent can these changes be attributed to shifts in the geographic distribution of these households versus improvements in neighborhoods where these households are concentrated?

Using data on annual census tract-level crime rates in 91 large cities that were averaged for the years 1999 to 2001, we address our first question by examining the exposure of voucher holders

[1] Greenwood and Stock (1990) is an exception; they found that residential decisions of low-income households are also affected by crime.

[2] This increased choice itself may affect urban form, but we do not examine that in this article.

to crime.[3] We experiment with a variety of counterfactuals to assess whether vouchers are enabling households to reach safer neighborhoods than those in which they would have likely lived absent their vouchers. We shed light on our second question by exploring differences in exposure to crime across subgroups of voucher holders. Finally, using tract- and neighborhood-level crime data from 7 cities in 1998 and 2008, we describe changes over time in the degree to which voucher holders in those cities were exposed to crime in their neighborhoods.

Before conducting these empirical analyses, we provide a summary of the relevant literature. Next, we describe the data and our methods. We then present the empirical results of our analyses and conclude with a discussion of the key findings and the policy implications. As a preview, we find that, in the large cities we studied, voucher households live in lower crime neighborhoods than other subsidized households. The findings regarding subgroups are nuanced. Black voucher holders face higher neighborhood crime rates than White and Hispanic voucher households, but Black voucher holders live in safer neighborhoods than other renters of the same race, whereas White and Hispanic voucher holders do not. As for changes over time, voucher holders in our seven sample cities lived in substantially safer neighborhoods in 2008 than they did in 1998. The movement of voucher households, however, contributed little to those improvements. Rather, the key change was that the crime rates in the neighborhoods where voucher holders typically live fell markedly.

Previous Literature

Despite being discussed in policy circles as far back as the 1930s, vouchers did not become a feature of federal housing policy until 1974 (Orlebeke, 2000; Schwartz, 2006), but the program grew quickly. By 1980, more than 625,000 households held vouchers; in 2008, that number ballooned to more than 2.2 million. Voucher households comprised 44 percent of U.S. Department of Housing and Urban Development (HUD)-assisted households in 2008.

A key potential benefit of vouchers is that they provide households much more flexibility over location choice than project-based assistance does. Enhanced location choice, proponents argue, will likely reduce urban poverty concentration and allow voucher households access to higher opportunity neighborhoods. Whereas public housing and low-income housing tax credit (LIHTC) residents are typically quite limited in their choice of developments and units, voucher households should be able to select from a much wider array of neighborhoods and, therefore, have the opportunity to choose lower crime areas. In addition, voucher tenants are less visible to neighbors than public housing and LIHTC developments and, thus, may have an easier time reaching neighborhoods with lower crime and poverty rates.

Moreover, recent policy changes have expanded the portability of vouchers. In 1987, Congress amended the Section 8 statute to permit voucher holders to use their subsidies anywhere within a given metropolitan area and, in 1999, further amended the statute to allow for voucher use anywhere within the United States. In addition, the HOPE VI Program and the Quality Housing

[3] Note that we do not have census tract-level crime data in the suburbs of these large cities (although some of the cities themselves are considered suburban), so our analysis is limited to central cities.

and Work Responsibility Act of 1998 have provided HUD with additional tools to help local public housing authorities deconcentrate assisted households, frequently with the use of housing vouchers.

Still, voucher location choice is surely constrained. Maximum rents paid are capped by Fair Market Rents, potentially limiting neighborhood options (although Devine et al. [2003] show that almost all communities have rental housing units that would be affordable to voucher holders). In addition, landlords may resist accepting tenants with vouchers, especially in lower crime and lower poverty environments, and voucher holders may have limited information about alternative neighborhoods when making their choices.

Poverty Exposure for Subsidized Households

Most of the literature describing the neighborhoods in which assisted households lived focuses on poverty rates. For traditional public housing residents, the evidence clearly illustrates that they live in comparatively poor neighborhoods. Goering, Kamely, and Richardson (1997) found that, in 1990, slightly less than one-half of all public housing tenants lived in high-poverty census tracts (tracts with poverty rates of 40 percent or higher). Similarly, Newman and Schnare (1997) reported that more than 43 percent of tenants in family public housing lived in high-poverty census tracts in 1990.

Evidence suggests that voucher households also live in neighborhoods with higher than average poverty. Pendall (2000), examining census tract-level data from HUD on 1998 voucher households, found that neighborhoods with voucher holders had a 1990 poverty rate of 20 percent on average, compared with the nationwide average of 15 percent. In addition, tenants receiving all forms of assistance were more likely than renters as a whole to live in neighborhoods scoring high on a neighborhood distress index, constructed from poverty rates; public assistance receipt; and the proportion of female-headed households, high school dropouts, and labor force participants.

Nonetheless, studies typically find that voucher holders live in somewhat less distressed census neighborhoods than other assisted households. For example, in their comprehensive examination of the location patterns and neighborhood characteristics of the entire voucher population, Devine et al. (2003) found that almost 83 percent of census tracts in the 50 largest metropolitan statistical areas (MSAs) included at least one voucher household. By contrast, only 8 percent of all census tracts in these MSAs included public housing units. The relatively high dispersion of voucher households suggests that at least some voucher households must live in high-quality neighborhoods. Indeed, in the same study, the authors found that, in 1990, almost 30 percent of voucher households lived in census tracts with fewer than 10 percent of the residents living in poverty. Another 30 percent lived in tracts with 10- to 20-percent poverty rates. Approximately 22 percent of voucher families lived in neighborhoods with poverty rates of 30 percent or more.

Hartung and Henig (1997) provided evidence that the voucher program in the Washington, D.C. metropolitan area has been more effective in providing access to lower poverty neighborhoods than other forms of housing assistance. They found that, although 76 percent of the public housing and 50 percent of the other HUD-assisted developments are in tracts with median incomes below $25,000, only 32 percent of voucher households live in such tracts. Thus, although about 90 percent of Washington, D.C.'s voucher households lived in tracts with median incomes below $75,000, they were less concentrated in poor tracts than their counterparts living in public housing and other place-based, subsidized housing.

Most recently, McClure (2006) compared locational outcomes for the voucher and LIHTC programs. Using 2002 administrative data on voucher households and LIHTC units placed in service through that year, he found that about 30 percent of LIHTC households and 26 percent of voucher households lived in low-poverty census tracts and, on average, voucher households lived in very slightly lower poverty neighborhoods than LIHTC households.[4] Significantly, the proportions of LIHTC and voucher households in high-poverty tracts were slightly lower than the percentages of poor households that lived in high-poverty tracts, although they were higher than the share of all renters who lived in such tracts. The households assisted through both of these programs, in other words, were reaching neighborhoods with somewhat lower poverty rates than poor households, but they were still living in neighborhoods that had significantly higher poverty rates than other renters (at least in 2002).

A number of authors have documented the tendency for the voucher population to cluster geographically (Wang and Varady, 2005; Wang, Varady, and Wang, 2008). This clustering does not appear to be simply the result of the clustering of units with rents below Fair Market Rents. Racial segregation, imperfect information, and the refusal of landlords to rent to voucher households all likely contribute to clustering as well (Turner, Popkin, and Cunningham, 1999). Even these clustered households, however, live in significantly lower poverty neighborhoods compared with public housing households.

Neighborhood Crime Rates

Few studies examine the neighborhood crime rates experienced by voucher holders, largely because of a lack of suitable data. However, studies of three major mobility programs—Gautreaux, MTO, and HOPE VI—provide some evidence on the neighborhood safety of both public housing residents (pre-move) and voucher households (post-move). Because participants were chosen precisely because they lived in distressed neighborhoods, the reported numbers are not generalizable to all subsidized households. Nonetheless, the figures are illuminating. In brief, these groups were located in very high-crime areas when living in their original public housing developments and chose to move to lower crime (yet still relatively unsafe) areas 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. Gautreaux offered Black families in CHA housing the opportunity to move to desegregated areas around the Chicago area, including the suburbs. The program moved more than 7,000 families between 1976 and 1998 (Keels et al., 2005). 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 compared with the city as a whole. Keels et al. (2005) estimated that violent crime rates in Gautreaux participants' original neighborhoods were three times as high as those in the average Chicago neighborhood.

[4] It is worth noting that LIHTC units were relatively more concentrated in low-poverty neighborhoods than voucher units were in the suburbs, but that they were slightly less concentrated in central cities. Our analysis focused on large cities.

In the short-term, those households that moved to new neighborhoods through the program continued to face higher crime rates than others in their surrounding areas. Suburban movers landed in neighborhoods with a violent crime rate about five times as high as the crime rate in the Chicago suburbs at that time, and those that moved within the city faced violent crime rates about one and one-half times as high as the average neighborhood in the city. In the longer term, however, the Gautreaux households tracked by Keels et al. (2005) lived in neighborhoods with violent and property crime rates that were comparable to the rates for the county as a whole.

HUD launched MTO in 1993 as a five-city experimental demonstration to move subsidized households living in high-poverty public housing developments into low-poverty neighborhoods. 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) reported that almost 60 percent of the Los Angeles participants cited getting away from drugs or gangs as the primary reason for wanting to move. A shocking proportion of these respondents reported that one or more of their household members were the victim of a crime in the past 6 months. Administrative data supported these reports of victimization. Violent crime rates for the baseline MTO census tracts in Boston, Chicago, and Los Angeles were three times higher than in the metropolitan areas as a whole (Kingsley and Pettit, 2008).

As for the post-move neighborhoods, some evidence indicates that MTO participants occupied lower crime neighborhoods after participating in the program. Kingsley and Pettit (2008) found that violent crime rates in Boston, Chicago, and Los Angeles were almost twice as high in the MTO origin neighborhoods than in the Section 8 movers' initial post-move neighborhood. Feins and Shroder (2005) reported results of pre- and post-move surveys for the MTO treatment, comparison, and control groups (the comparison group include households that received vouchers but were not restricted to use 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.[5] Thus, MTO participants were successful in using vouchers to move to safer neighborhoods.

Similarly, some evidence suggests that participants moving out of HOPE VI sites are moving to safer and more affluent neighborhoods. Buron et al. (2002) provided a snapshot of post-revitalization neighborhood conditions in eight cities and found that post-revitalization households still occupy relatively unsafe neighborhoods. Overall, about 40 percent of the respondents reported "big problems" with drug trafficking and gang activity in their current neighborhood, and fewer than 20 percent reported big problems with violent crime. Households in the sample that were no longer receiving a housing subsidy were the least likely to report big problems with drug trafficking and gang activity, while returning HOPE VI residents were the most likely to report big problems. 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 are still in progress.

[5] Questions address 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.

Considered as a whole, previous work on the neighborhood conditions faced by subsidized households suggests that voucher households, on average, live in neighborhoods with higher poverty rates than the average renter, but they live in lower poverty areas than public housing tenants and in areas with slightly lower poverty rates than other poor households. Thus, tenants assisted through these programs have had some success in reaching low-poverty neighborhoods, but the success has been relatively modest. We know little about the exposure of voucher households to crime. What we do know comes from the experience of a very particular subset of voucher holders that moved out of distressed public housing developments through the Gautreaux, MTO, or HOPE VI programs. This body of research offers some suggestive evidence that these selected voucher recipients have been successful in moving to safer neighborhoods. It remains to be seen if the broader voucher population—those not necessarily eligible for and selected into specialized programs, and representing a wider array of cities—has been able to reach safer neighborhoods.

Data and Methods

Our analysis relies on two sets of crime data, all restricted to large cities (rather than MSAs). First, we use data from the *National Neighborhood Crime Study* (Peterson and Krivo, 2010), 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. Crime counts from 1999 to 2001 were provided to Peterson and Krivo by local police departments. The data set includes an average of the Part I crime categories over the entire 3 years for each census tract. Such 3-year averages allow for abnormal spikes to be smoothed out over the sample period, and are frequently used in crime research when available (Sampson, Raudenbush, and Earls, 1997). The sample of 91 cities was randomly chosen from all cities with at least 100,000 people as of the 2000 Census, and then was stratified by region. In the event that a city's police department was not able to provide crime data, the city was replaced with a city that was similar in terms of geography and demographics. A list of the 91 cities, in addition to basic descriptive statistics on crimes and subsidized housing units for each city, is shown in appendix A-1.

The second data set includes annual census tract-level crime data for seven U.S. cities—Austin, Chicago, Cleveland, Denver, Indianapolis, Philadelphia, and Seattle—from 1998 to 2008. Appendix A-2 displays the crime data availability for those years and describes the sources of the data.[6]

We merged census tract-level counts of four types of households to the crime data—voucher households, renter households below the poverty line, public housing tenants, and LIHTC households. We obtained voucher and public housing data from HUD's Picture of Subsidized Households. At the present time, voucher data are available through this data set for 1998, 2000, 2004, and 2008. In addition, we obtained access to household-level voucher data from HUD for 2000 to estimate

[6] We do not have 2008 data for three of the cities. For these cities, we use 2007 crime data to estimate 2008 voucher crime exposure rates. Although this is not ideal, there is not much reason to expect substantial changes in the neighborhood distribution in crime from 2007 to 2008 in these cities, and this is preferable to limiting the 2008 analysis to four cities. In Cleveland, which has missing crime data for 1998, we use 1997 and 1999 crime data to estimate 1998 crime rates using a linear interpolation.

crime exposure rates for voucher households with different demographic characteristics. Public housing data are available for 1996 to 1998, 2000, 2004, and 2008. LIHTC data are available from HUD's LIHTC database from 1987 to 2007. U.S. Census data on poor renter counts are available for 2000. Finally, we merge these data with 2000 Census counts of total housing units and tract-level demographic statistics from the Urban Institute's Neighborhood Change Database.

As with all administrative data sets, gaps in coverage and variation in quality exist. HUD collects voucher and public housing data from local housing authorities, and in the early years of our sample, reporting rates were sometimes well below 100 percent. (The data set provides complete information for 87 percent of voucher recipients in 1998, for example.) By 2008, reporting rates rose to 98 percent. HUD publishes the percentage of vouchers and public housing units that are reported by each city, so we can identify which cities were most affected by these data gaps. Appendix A-3 displays the percent reported by each city's housing authority for the longitudinal sample (Austin, Chicago, Cleveland, Denver, Indianapolis, Philadelphia, and Seattle) in 1998 and 2008. In 1998 (and presumably 2008), the reporting rate for vouchers was consistently very high. For all cities aside from Indianapolis (84 percent), the reporting rate was 99 percent. Public housing reporting rates were considerably lower, at least in 1998. In that year, reporting rates for public housing were just 54 percent in Chicago and 50 percent in Philadelphia. We have little reason to believe, however, that reporting rates would vary with the crime rates of the development. If they did vary, we expect that they would be lower in higher crime developments, suggesting that our results could potentially understate the crime rates experienced by public housing residents.

Exhibit 1 displays descriptive statistics as of 2000 for the 91-city cross-sectional sample and the 7-city longitudinal sample. Because our samples are restricted to large cities (that is, not MSAs) we also provide descriptive statistics for all tracts in U.S. cities with populations greater than 50,000 as a comparison.

Exhibit 1

Average City and Census Tract Characteristics in 2000

	91-City Cross-Sectional Sample (N=9,583)	7-City Longitudinal Sample (N=1,806)	All Tracts in U.S. Cities > 50,000 Population (N=25,893)[a]
Crimes per 1,000 people	62.0	71.4	75.8
Average Tract Characteristics			
Voucher holders per tract	31.8	28.7	30.4
LIHTC units per tract	22.7	23.0	19.6
Public housing per tract	26.3	43.3	27.7
Poor renters per tract	184.4	196.3	170.3
Population per tract	4,114	3,765	4,111
Poverty rate (weighted average)	16.9%	19.5%	15.5%
Percent non-Hispanic White (weighted average)	48.4%	42.1%	53.2%
Percent non-Hispanic Black (weighted average)	22.5%	33.3%	18.8%
Percent Hispanic (weighted average)	22.9%	19.2%	20.4%
Total population in tracts	39,426,839	6,799,280	106,466,565

LIHTC = low-income housing tax credit.

[a] *All core cities of metropolitan areas, FBI Uniform Crime Reports, 2000.*

Comparing the three samples in exhibit 1, we see that the tracts in the longitudinal sample differ slightly demographically from the full set of urban tracts, but the tracts included in the 91-city sample are quite similar to the full set. Specifically, the tracts in the seven-city sample have larger percentages of poor and Black residents than the full city sample. The tracts in the 91-city sample contain similar proportions of people in poverty and in different racial groups as those in the full city sample, although the 91-city sample is slightly more non-White. The largest difference between the two samples is the city crime rates; the average crime rate is considerably lower for the 91 cities than for the full set of U.S. cities.

As for subsidized housing, average voucher concentrations within census tracts are fairly uniform throughout the two samples and all U.S. cities, ranging from 29 to 32 voucher holders per tract, or approximately 2 percent of all housing units. LIHTC concentrations also vary little across the samples, ranging from 20 to 23 per tract (less than 2 percent of a tract's housing units on average). Public housing concentration is much more varied across the samples. In the longitudinal sample, Chicago's presence among the seven cities leads to a larger average number of public housing units per census tract than the other samples.

Appendix B-1 displays how crime and housing variables change over time in the cities in the longitudinal sample. As shown, crime rates decreased over time, as they did across the United States, while the number of voucher households and LIHTC units increased, but the number of public housing units declined. Aggregate crime rates (expressed as crimes per 1,000 people)[7] declined 23 percent from 1998 to 2008. From 1998 to 2008, the number of voucher and LIHTC households doubled. Public housing units did the opposite—declining over the decade from 73,181 to 57,207 units.

Finally, we have access to data from more than 212,000 individual voucher households that, in 2000, lived in one of the 91 cities for which we have crime data. This represents 17 percent of all voucher holders nationwide in 2000. (These cities also contain 23 percent of LIHTC tenants and 19 percent of all public housing tenants.) From these data we can determine whether the household used a voucher to move into that census tract in that year, the race of the household head, whether the household contains children under 18, and the total household income.

Estimating Group-Specific Crime Exposure

To estimate the crime rates faced by the typical household in each group, we estimate crime exposure rates, which weight a neighborhood's crime rate by the proportion of the sample's relevant household type (voucher, LIHTC, etc.) within that neighborhood. These exposure rates, in other words, essentially show the neighborhood crime rate experienced by the average member of the given group. Specifically, the crime exposure measure is expressed for voucher households as

$$\sum_{i=1}^{n}\left[[Crime]_i * \left(\frac{v_i}{V}\right)\right] \qquad (1)$$

[7] Crime rates are expressed both as crimes per 1,000 people and as crimes per 1,000 housing units. In the results section, however, we present crime exposure rates as crimes per 1,000 people, with crimes per 1,000 housing units and crimes per square mile as robustness checks, included in the appendix.

where $Crime_i$ is the crime rate (either total or violent) in census tract i, v_i is the number of voucher households (or public housing, LIHTC, or poor renter households) in census tract i, and V is the number of voucher households (or public housing or LIHTC units, or poor renter households) in the sample. The resulting value is essentially a weighted average neighborhood crime rate, or the crime rate faced by the typical household in that group. We conduct statistical tests to learn if the differences in means across groups are statistically significant. In addition, we estimate the percentage of each housing subgroup population that resides in a high-crime neighborhood, which is defined as a neighborhood with a crime rate at least one standard deviation above the mean. In robustness checks, we also use the number of crimes per square mile of land area and the number of crimes per 1,000 housing units.

Comparing voucher household crime exposure with that of the general population is informative, but it does not provide a very good counterfactual for where voucher households would have lived if they had not had the benefit of a housing voucher. To provide a sense of the other options that voucher households might have in the absence of a voucher program, we consider the average crime rates in the neighborhoods where LIHTC units, public housing units, and all units occupied by poor renters are located. These housing units represent locations where voucher households might live in the absence of the program. Comparing the neighborhoods of voucher holders with those of tenants in place-based programs sheds light on whether the increased choice provided by vouchers helps subsidized households reach better neighborhoods. Because much of the growth in the voucher program is a result of the demolition of public housing, public housing locations serve as a viable counterfactual for where voucher holders could be living if such demolitions had not occurred. The LIHTC, as the largest place-based housing subsidy in the country, is another relevant place-based counterfactual.

Identifying Changes in Voucher Crime Exposure Over Time

To estimate the relative changes in crime exposure among the voucher households from 1998 through 2008, we first limit the sample to a balanced panel, which includes only neighborhoods for which we have crime and housing data in 1998 and 2008. Note that we have two mechanisms through which crime exposure could change over time for voucher holders. First, the distribution of voucher households across neighborhoods could shift to neighborhoods with higher or lower crime rates. Second, the distribution of voucher holders could remain constant, but crime rates could increase or decrease in the neighborhoods in which voucher holders are located. This is an important distinction for policy. If the gains in public safety for voucher holders were largely a result of safety gains within their existing neighborhoods, the continued mobility allowed by the voucher program may not deserve a lot of the credit for these gains. If, however, the vouchers enabled tenants to move to safer neighborhoods, then continued mobility deserves the credit.

To test whether changes in crime exposure for voucher households were due to spatial shifts in crime patterns, we decompose the crime changes and compute a hypothetical crime exposure rate, showing what the crime exposure rate would have been for voucher holders in 2008 if the distribution of voucher holders had remained unchanged between 1998 and 2008. This rate uses the 1998 voucher neighborhood distribution with 2008 crime rates, defined notationally (for vouchers) as

$$\sum_{i=1}^{n}\left[[Crime]_{i,2008} * \frac{v_{i,1998}}{V_{1998}}\right]. \quad (2)$$

If the actual crime exposure rate in 2008 (using 2008 crime and voucher distributions) is roughly the same as this hypothetical rate, then we can infer that changing conditions in the neighborhoods where voucher holders tend to live largely drove any changes. By contrast, if we find that the actual crime exposure rate is significantly lower than the hypothetical crime exposure rate, then we infer that changes in the distribution of voucher holders likely explained a large part of any reduction in exposure.

Cross-Section Results

Exhibit 2 displays crime exposure rates for the 91 cities in the cross-sectional sample covering the year 2000. We include in the exhibit crime exposure rates for all households, voucher households, LIHTC tenants, public housing tenants, and poor renters living in these cities.

The exhibit shows that voucher holders, on average, lived in neighborhoods that had significantly higher crime rates than those lived in by all households but slightly lower crime than those lived in by poor renters.

As for comparisons to residents living in other types of subsidized housing, voucher holders lived in neighborhoods that were significantly more safe than those lived in by tenants in place-based subsidized housing programs. In 2000, public housing tenants and, perhaps surprisingly, LIHTC tenants, lived in significantly higher crime neighborhoods than voucher holders. (All of these results are robust to modifications in the crime rate denominator.)

What about exposure to violent crimes in particular? Total crime rates are largely driven by property crimes, particularly larceny and other thefts. (In this sample, only 15 percent of the crimes are violent crimes.) Exposure to violence, however, may be a particular concern. Aizer (2008) found that lower youth cognitive test scores can be explained in part by association with violent peers and exposure to neighborhood violent crime. Sharkey (2010) found that children living in census block groups where a homicide occurs 1 week before a standardized test perform worse than other comparable children.

Exhibit 2

Crime Exposure Rates in 2000 (sample: 91 cities)

Type	Crimes per 1,000 People	Statistically Different From Voucher Crime Exposure Rate?	Violent Crimes per 1,000 People	Statistically Different From Voucher Violent Crime Exposure Rate?
All households	62.0	Significantly lower (1%)	9.2	Significantly lower (1%)
Voucher households	76.9	NA	14.3	NA
LIHTC tenants	100.6	Significantly higher (1%)	16.9	Significantly higher (1%)
Public housing tenants	108.4	Significantly higher (1%)	22.3	Significantly higher (1%)
Poor renters	82.2	Significantly higher (1%)	14.4	No

LIHTC = low-income housing tax credit. NA = not applicable.

The patterns for violent crime exposure are fairly similar to those for total crime exposure. Among assisted households, public housing residents lived in the most violent neighborhoods on average, while voucher holders lived in the least violent. On average, voucher holders lived in neighborhoods with safety levels very close to those of the neighborhoods lived in by the average poor renter.

Another way to measure differences in crime exposure is to compare the proportion of each population that lived in a high-crime neighborhood, defined as neighborhoods with crime rates more than one standard deviation above the mean. Exhibit 3 displays these proportions, together with results from statistical tests of differences in proportions between tenants in each housing program.

The share of voucher holders who lived in high-crime neighborhoods was significantly lower than the proportion for either LIHTC or public housing tenants. The only difference between these results and those in exhibit 2 is that the proportion of LIHTC households living in high-crime neighborhoods was slightly higher than the share of public housing residents, although the difference is not statistically significant. The violent crime results are also very similar.

These promising findings on voucher crime exposure appear to contradict previous work that finds that voucher households have had limited success in gaining access to higher quality neighborhoods (McClure, 2008; Pendall, 2000; Wang, Varady, 2005; Wang, Varady, and Wang, 2008). These differences could be because of idiosyncrasies in our sample or they could reflect differences in patterns of exposure to crime as compared with exposure to poverty and racial minorities. To test this using the 91-city sample, exhibit 4 expands on the analysis presented in exhibit 2, displaying poverty and minority exposure rates and average crime rates for the housing subgroups in 2000.

Exhibit 3

Percent in High-Crime Neighborhoods by Type of Housing in 2000 (sample: 91 cities)

Type of Housing	Percent in High-Crime Neighborhoods	Statistically Different From Voucher Proportion?	Percent in High-Violent Crime Neighborhoods	Statistically Different From Voucher Proportion?
Total	3.1	Significantly lower (1%)	5.1	Significantly lower (1%)
Voucher households	4.4	NA	11.0	NA
LIHTC tenants	11.3	Significantly higher (1%)	16.4	Significantly higher (1%)
Public housing tenants	10.8	Significantly higher (1%)	23.9	Significantly higher (1%)
Poor renters	6.0	Significantly higher (1%)	11.4	Significantly higher (1%)

LIHTC = low-income housing tax credit. NA = not applicable.

Exhibit 4

Neighborhood Crime, Poverty, and Minority Exposure Rates in 2000 (sample: 91 cities)

	Crimes per 1,000 People	Average Poverty Rate (%)	Average Percent Minority (%)
Voucher households	76.9	24.4	59.3
LIHTC tenants	100.6	26.8	58.1
Public housing tenants	108.4	36.7	65.7
Poor renters	82.2	26.9	51.8

LIHTC = low-income housing tax credit.

The exhibit clearly illustrates that crime exposure patterns are indeed different. LIHTC and voucher households, on average, live in communities with virtually identical poverty rates and minority population shares, but they live in communities that are quite different in terms of crime. Household preferences might help to explain the differences and similarities between crime, poverty, and minority exposure among these different types of households. The households with greater residential choice—vouchers and poor renters—live in neighborhoods with dramatically lower crime rates but with fairly similar poverty rates and racial compositions. This suggests that voucher holders and other poor households, when choosing neighborhoods, may prioritize the avoidance of high-crime areas, not neighborhoods with high minority and/or poor populations. This prioritizing also suggests that if our key interest is facilitating access to safe neighborhoods that offer a rich set of opportunities, then poverty rates and minority concentration may not serve as ideal proxies.

Differences Across Subgroups of Voucher Holders

Although the previous exhibits provide useful information about the location and neighborhood choices of the average voucher holder, this section explores whether notable differences across subgroups exist. We know that housing market opportunities and outcomes differ noticeably by income, race, and family structure; the opportunities and outcomes of housing voucher holders may differ as well. Exhibit 5 displays crime exposure rates for voucher households, disaggregated by the race of the household head, household income strata, and the presence of children.

The largest differences are across income groups, where we see a monotonic decline in voucher exposure to neighborhood crime as household income increases. This seems surprising given that vouchers should technically neutralize income differences by allowing households to pay only 30 percent of their income for rent. As for racial differences, Hispanic voucher holders lived in neighborhoods with the lowest crime, and Black voucher holders lived in the highest crime

Exhibit 5

Voucher Crime Exposure in 2000 by Demographic and Mobility Characteristics (sample: 91 cities)

Subgroup of Voucher Holders	Crimes per 1,000 People[a]
All voucher holders	78.4
White voucher holders	76.7*
Black voucher holders	81.4
Hispanic voucher holders	69.3*
Household income < $10,000	81.8
Household income $10,000 to $19,999	75.1**
Household income $20,000 to $29,999	69.3**
Household income > $30,000	63.7**
Households with children (NS)	77.0
Households without children	80.7

NS = Not statistically different from relevant reference category.

[a] These rates are slightly higher than the voucher crime exposure rates reported in exhibit 3 because of differences between the household data and those reported in HUD's Picture of Subsidized Households.

**Significantly different from Black voucher holders at the 1-percent level.*

***Significantly different from voucher holders with incomes below $10,000 at the 1-percent level.*

neighborhoods. Crime exposure rates for voucher households with children were only very slightly lower than those for households without children, and the difference was not statistically significant.

Although exhibit 5 suggests that Hispanic voucher holders are the least exposed to crime, and that Black voucher holders are the most exposed, it fails to take into account the safety level of the neighborhoods that households of different races tend to live in absent housing assistance. Although it is impossible to know exactly where households would have lived absent their voucher, exhibit 6 approximates such a counterfactual by comparing exposure to neighborhood crime for voucher households of different races with exposure of poor households and renter households of the same race. The implicit assumption, in other words, is that absent a voucher, households would have lived in the neighborhoods lived in by unassisted, poor, and renter households of the same race. This comparison does not suggest that voucher holders should be constrained or guided in their residential choices by their race; it simply assumes that they are as likely to operate under such constraints, just like unassisted poor and renter households of the same race.

The results are surprising. White and Hispanic voucher holders tend to live in *higher* crime neighborhoods than their counterparts who do not receive vouchers (poor households and renter households). By contrast, Black voucher households live in census tracts with slightly *lower* crime rates than Black poor and Black renter households. The voucher program is helping to close the Black-White and Black-Hispanic racial gaps in exposure to crime. Of course, our comparison groups may differ from voucher holders in unobserved ways, and these differences may be more pronounced for particular racial groups. For instance, White and Hispanic voucher holders may have quite different location preferences or face very different constraints compared with the full set of White and Hispanic poor households, but Black voucher holders may be more similar to other Black poor households. Thus, we should be cautious in drawing conclusions from these findings.

Exhibit 6

Voucher, Poor, and Renter Household Crime Exposure Rates by Race (sample: 91 cities)

Population	Crimes per 1,000 People
White	
Voucher households	76.7
Poor households	65.1
Renter households	70.3
Black	
Voucher households	81.4
Poor households	87.5
Renter households	88.3
Hispanic	
Voucher households	69.3
Poor households	64.0
Renter households	66.5

Longitudinal Results

The cross-section analyses suggest that, at least in cities, voucher households lived in neighborhoods that were about as safe as those where poor renters lived, and they lived in lower crime neighborhoods than where other subsidized households lived. We now examine how voucher crime exposure changed over time. Exhibit 7 displays 1998 and 2008 crime exposure rates for all households and for voucher households in Austin, Chicago, Cleveland, Denver, Indianapolis, Philadelphia, and Seattle.

Exhibit 7 illustrates that total crime dropped considerably in the entire sample (from 79 to 64 crimes per 1,000 people), but the reduction was not statistically significant and not every city enjoyed these reductions.[8] Austin, Denver, and Indianapolis actually experienced slight increases in overall crime rates. Notably, the reduction in the crime rates in the neighborhoods where voucher holders lived was even larger than that for all tracts and was statistically significant, unlike the reduction for all tracts. The typical voucher household experienced a reduction in crime in every city except for Austin (where average crime rates rose slightly from 69 to 72 crimes per 1,000 people), and even in that city, the crime increase for voucher holders was smaller than that experienced by the average household in the city. The only city where the overall crime decrease was greater than the crime decrease for voucher holders was Chicago. In Cleveland, Denver, Indianapolis, and Seattle, voucher holders experienced greater decreases in neighborhood crime than the overall population.

Although it is impossible to know exactly what drove these reductions in exposure to neighborhood crime, a simple decomposition can shed some light on the causes.[9] Two possible explanations emerge. Either the spatial distribution of voucher households changed and they moved disproportionately to lower crime neighborhoods, or it remained the same but the neighborhoods voucher holders lived in experienced disproportionate declines in crime. To tease out the correct

Exhibit 7

Changes in Crime Exposure, 1998–2008 (sample: 7-city longitudinal)

	1998		2008	
	All Households	Voucher Households	All Households	Voucher Households
All	78.9	101.9	64.3	79.0
Austin	63.2	69.3	68.0	72.6
Chicago	81.5	103.1	55.8	77.5
Cleveland	68.5	69.8	63.0	63.6
Denver	67.4	104.1	71.7	76.1
Indianapolis	117.3	135.5	120.7	124.9
Philadelphia	74.0	80.1	64.7	63.9
Seattle	94.2	181.5	66.8	122.0

[8] Note that the value of the crime rate denominator does not change from 1998 to 2008. Thus, we are underestimating crime rate decreases in neighborhoods and cities with population growth.

[9] The analysis does not take into account the possibility that the spatial location of these households could affect neighborhood crime rates but still allows us insight into whether crime decreases were more related to household movements or within-tract improvements.

explanation, we estimate how average neighborhood crime rates for these subgroups would have changed over time if the geographic distribution of each subgroup had remained constant. Specifically, exhibit 8 presents what crime exposure rates would have been in 2008 had the distribution of voucher holders across neighborhoods remained identical between 1998 and 2008. (In other words, we calculate the exposure of 1998 voucher holders to 2008 neighborhood crime rates.) We compare these hypothetical neighborhood crime rates with the actual 2008 crime exposure rates.

Exhibit 8

Decomposition of Crime Rate Changes (sample: 7-city longitudinal)

	1998 Voucher Location, 2008 Crime	2008 Voucher Location, 2008 Crime
All	82.4	79.0
Austin	76.0	72.6
Chicago	77.7	77.5
Cleveland	64.3	63.6
Denver	109.7	76.1
Indianapolis	122.1	124.9
Philadelphia	68.9	63.9
Seattle	117.9	122.0

As shown in exhibit 8, the hypothetical crime exposure rates in the 1998 voucher location column the left are generally only slightly larger than the actual 2008 crime exposure rates on the right, suggesting that improvements in crime exposure were mostly driven by improvements in the neighborhoods where the various housing groups lived at baseline, rather than by the movement of voucher recipients to lower crime neighborhoods. Still, the hypothetical crime exposure rates are typically somewhat higher than actual crime exposure rates (and significantly higher in Denver), suggesting that some portion of the reduction in exposure of voucher holders to crime likely resulted from shifts in the distribution of voucher holders towards lower crime neighborhoods. This shift suggests that ongoing mobility (rather than initial access to particular neighborhoods) contributed a small amount to improvements in voucher neighborhood safety.

Discussion

Using a number of different data sources, this article has described the extent to which voucher households are exposed to neighborhood crime, as compared with public housing residents, LIHTC tenants, and other poor renter households, in a representative sample of U.S. cities. Our key finding is that, overall, in 2000, voucher households occupied significantly lower crime neighborhoods than LIHTC and public housing tenants and slightly lower crime neighborhoods than poor renters as a whole. Voucher households are less likely to live in neighborhoods with particularly high crime than any of these comparison groups. Interestingly, the safety benefits of vouchers appear to be especially pronounced for Black voucher holders. Black voucher holders lived in safer neighborhoods than other Black renters and Black poor households.

In sum, vouchers appear to be helping low-income households reach safer neighborhoods or at least avoid neighborhoods that are the least safe. Given the growing evidence about the importance of crime in shaping children's outcomes, this greater access provides an important argument in

favor of switching from reliance on production-based housing to reliance on vouchers. In the long run, our findings also suggest that, if given the means, a greater share of low-income households would be able to avoid very high-crime neighborhoods.[10]

It is worth underscoring that, by limiting our analyses to large cities, we are likely overstating the neighborhood crime rates faced by voucher holders and LIHTC tenants, because we are omitting the large number of them who live in suburban communities. By 2000, voucher holders—and LIHTC tenants—were much more likely than public housing tenants to live in the suburbs (Devine et al., 2003). Although central city and suburban poverty rates have been converging in recent years, crime rates are still lower, on average, in suburban communities than they are in central cities (Ellen and O'Regan, 2009). Finally, because patterns of suburbanization may differ across races, the relative exposure to crime of different subgroups might differ in the suburbs.

Appendix A

We collected crime data from one of three sources: (1) directly from police department websites or data requests to the department (Austin and Seattle); (2) from researchers who obtained these data from police departments (Chicago); or (3) from the National Neighborhood Indicators Partnership, a consortium of local partners coordinated by the Urban Institute to produce, collect, and disseminate neighborhood-level data (Cleveland [Case Western Reserve University], Denver [The Piton Foundation], Indianapolis [The Polis Center], and Philadelphia [The Reinvestment Fund]). For all cities, total, property, and violent crimes are included, and for all cities except Denver and Indianapolis, crimes are further disaggregated into all Part I crimes (violent crimes—assault, sexual assault, homicide, and robbery; property crimes—larceny, burglary, motor vehicle theft, and arson).[11] In all cities except for Denver, neighborhoods are proxied by census tracts.[12] Denver crime data are aggregated to locally defined neighborhoods, which are typically two to three census tracts. In Denver, we aggregated the tract-level housing data to the neighborhood level and linked these variables to the neighborhood crime data.

[10] In addition to showing these positive impacts for households, the results suggest that vouchers do contribute to a different spatial distribution of subsidized households.

[11] Philadelphia was unable to share numbers on sexual assaults or homicides; thus, those crimes are not included in overall totals or the individual categories. Given Philadelphia crime data were available from 1998 through 2006, we used 1998 and 1999 crime data to estimate 1997 numbers and 2005 and 2006 crime data to estimate 2007 numbers.

[12] Although Denver data are at the neighborhood level, 4,447 of our 4,523 neighborhoods are equivalent to census tracts. Thus, in describing data and results, we often use the term "census tract."

Exhibit A-1

City List and Descriptives for 91-City Cross-Section, 2000 (1 of 4)

City	Population	Housing Units	Crimes per 1,000 People	Crimes per 1,000 Housing Units	Vouchers	LIHTC Units	Public Housing Units	Rental Units Occupied by Poor Households
Akron, OH	240,756	107,544	58	129	2,852	1,818	3,647	11,753
Albuquerque, NM	481,532	211,547	80	182	4,058	1,945	846	17,601
Alexandria, VA	128,283	64,251	44	88	991	987	889	3,647
Anchorage, AK	258,847	99,932	39	102	1,657	401	588	4,372
Arlington, TX	347,483	136,874	64	162	2,203	2,509	0	9,058
Aurora, IL	232,741	80,070	24	70	703	736	656	2,692
Austin, TX	739,944	310,334	53	127	2,415	3,397	2,036	29,051
Bellevue, WA	132,235	57,274	29	67	454	675	109	2,129
Boston, MA	571,815	248,834	62	142	9,590	10,426	9,879	39,801
Buffalo, NY	287,217	144,961	64	127	5,674	1,627	4,740	26,526
Carrollton, TX	125,315	48,150	29	75	199	1,015	94	1,647
Chandler, AZ	180,269	68,123	55	145	334	240	312	2,158
Charlotte, NC	600,199	256,489	78	182	2,462	2,223	3,345	15,437
Chicago, IL	2,871,155	1,149,324	68	169	22,711	17,893	36,840	153,744
Chula Vista, CA	176,724	60,352	37	107	1,642	428	121	4,045
Cincinnati, OH	342,844	171,839	69	137	5,292	4,260	6,793	26,849
Cleveland, OH	471,265	213,876	65	144	6,788	4,762	10,267	36,490
Columbus, OH	810,375	370,569	76	166	5,354	9,386	3,588	36,409
Coral Springs, FL	123,002	43,478	32	89	265	0	0	2,077
Dallas, TX	1,218,325	498,651	81	198	10,244	14,591	4,384	50,257
Dayton, OH	188,930	90,573	84	175	1,407	2,279	3,736	11,877
Denver, CO	545,324	248,236	48	106	4,291	2,248	3,849	22,761
Des Moines, IA	204,995	87,469	59	139	1,775	1,352	907	5,885
Detroit, MI	830,044	325,923	106	270	6,113	4,192	3,296	46,056
Eugene, OR	163,496	72,470	55	125	1,113	539	322	9,016
Evansville, IN	130,246	61,034	47	100	1,483	781	871	5,263
Fort Collins, CO	145,762	59,718	31	76	839	1,089	154	5,009
Fort Wayne, IN	222,320	98,145	51	115	1,205	850	703	6,861

Exhibit A-1

City List and Descriptives for 91-City Cross-Section, 2000 (2 of 4)

City	Population	Housing Units	Crimes per 1,000 People	Crimes per 1,000 Housing Units	Vouchers	LIHTC Units	Public Housing Units	Rental Units Occupied by Poor Households
Fort Worth, TX	560,623	223,464	65	164	2,582	4,123	1,134	18,606
Fullerton, CA	150,346	53,084	28	80	945	822	0	4,030
Garden Grove, CA	207,774	58,627	24	84	1,878	612	0	4,705
Glendale, AZ	229,093	83,080	58	160	1,080	320	155	5,688
Hampton, VA	133,657	56,431	44	104	1,822	817	585	4,343
Hartford, CT	120,563	50,622	86	206	4,322	991	2,262	11,960
Hialeah, FL	243,532	77,176	50	159	2,796	106	1,116	11,610
Houston, TX	1,786,008	710,802	73	183	7,812	9,578	2,863	77,360
Inglewood, CA	124,959	42,644	37	107	1,398	21	0	6,536
Irving, TX	191,611	80,315	49	116	629	1,808	0	5,551
Jacksonville, FL	736,273	311,388	66	156	5,376	4,051	2,679	21,224
Kansas City, MO	460,059	209,785	87	192	4,488	7,140	1,032	17,733
Knoxville, TN	203,648	101,764	48	96	1,930	529	3,848	13,702
Lexington, KY	255,676	115,769	47	105	1,730	365	1,535	11,415
Lincoln, NE	224,388	96,598	61	143	890	1,068	320	8,342
Livonia, MI	100,545	38,658	30	79	17	0	177	525
Long Beach, CA	460,927	172,305	37	99	5,271	645	713	25,881
Los Angeles, CA	3,658,681	1,333,008	45	123	30,902	15,462	6,479	202,406
Louisville, KY	306,550	144,563	46	99	5,009	1,604	4,784	18,585
Madison, WI	236,303	106,456	33	72	1,138	1,832	758	11,493
McAllen, TX	113,041	40,486	74	207	726	6	199	4,347
Memphis, TN	687,414	287,986	81	192	4,057	4,028	5,928	32,143
Miami, FL	369,590	151,261	62	152	2,231	2,484	7,346	34,253
Milwaukee, WI	557,852	235,699	77	183	4,775	1,532	4,807	34,064
Minneapolis, MN	370,201	165,817	68	152	2,601	579	5,863	18,041
Naperville, IL	166,283	58,960	12	34	145	180	0	588
Nashville, TN	547,083	245,891	82	182	3,917	3,486	5,805	21,076
New Haven, CT	117,584	52,498	86	191	2,314	1,055	3,028	9,953

Exhibit A-1

City List and Descriptives for 91-City Cross-Section, 2000 (3 of 4)

City	Population	Housing Units	Crimes per 1,000 People	Crimes per 1,000 Housing Units	Vouchers	LIHTC Units	Public Housing Units	Rental Units Occupied by Poor Households
Newport News, VA	174,412	73,129	54	129	1,450	2,215	2,189	7,527
Norfolk, VA	208,040	91,472	65	147	1,826	1,915	3,020	13,018
Oakland, CA	399,383	157,452	64	162	9,272	2,385	3,306	19,824
Oklahoma City, OK	527,044	238,989	75	166	5,242	3,643	2,942	22,088
Ontario, CA	206,229	60,488	35	119	588	168	20	4,995
Overland Park, KS	169,949	70,722	35	84	425	414	0	1,400
Pasadena, CA	135,341	54,663	38	93	1,080	896	0	5,470
Pasadena, TX	157,986	55,860	39	111	919	1,573	0	4,818
Pembroke Pines, FL	151,958	60,158	32	81	56	0	0	1,054
Philadelphia, PA	1,495,623	658,462	56	126	9,442	6,546	17,709	79,252
Phoenix, AZ	1,331,761	504,038	71	189	4,142	843	2,939	40,001
Pittsburgh, PA	256,847	126,485	71	145	3,094	885	6,292	17,620
Plano, TX	244,977	95,553	34	86	223	240	50	2,001
Portland, OR	548,383	246,513	71	159	4,583	6,144	2,690	21,432
Rockford, IL	173,119	73,597	72	168	1,397	648	2,215	6,080
San Antonio, TX	1,207,251	455,046	60	158	10,831	1,827	5,405	42,418
San Bernardino, CA	246,966	88,086	45	125	2,545	694	664	13,704
San Diego, CA	1,206,318	470,285	39	99	8,507	3,169	1,401	43,938
Santa Rosa, CA	180,030	69,451	30	78	1,683	1,485	0	3,605
Seattle, WA	509,031	246,431	84	173	3,740	4,123	5,580	19,867
Simi Valley, CA	115,787	38,858	14	42	614	793	0	764
St. Louis, MO	346,326	175,820	134	264	3,426	3,466	4,710	25,443
St. Petersburg, FL	258,395	130,993	80	158	2,048	34	687	7,978
Stamford, CT	117,083	47,317	26	64	566	1,038	841	2,638
Sterling Heights, MI	124,263	47,398	24	63	149	200	153	1,129
Tampa, FL	330,721	149,124	92	203	2,502	470	3,429	15,213
Tempe, AZ	155,877	66,711	93	216	696	0	0	7,036
Toledo, OH	321,871	144,193	76	170	2,320	2,109	2,843	16,373

Exhibit A-1

City List and Descriptives for 91-City Cross-Section, 2000 (4 of 4)

City	Population	Housing Units	Crimes per 1,000 People	Crimes per 1,000 Housing Units	Vouchers	LIHTC Units	Public Housing Units	Rental Units Occupied by Poor Households
Topeka, KS	132,199	59,949	94	208	713	1,207	634	4,774
Tucson, AZ	518,337	228,413	84	189	3,474	2,413	1,440	24,822
Virginia Beach, VA	423,697	162,194	38	98	880	1,784	0	6,657
Waco, TX	125,127	51,640	76	184	1,530	488	889	8,970
Washington, DC	558,502	272,899	63	129	5,264	4,817	10,277	35,569
Waterbury, CT	107,271	46,827	57	130	754	454	716	5,531
Worcester, MA	169,028	70,604	48	116	2,015	1,011	2,181	9,881

Exhibit A-2

Seven-City Longitudinal Crime Data by City and Year, 1998–2008

	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008
Austin	X	X	X	X	X	X	X	X	X	X	X
Chicago	X	X	X	X	X	X	X	X	X	X	X
Cleveland		X	X	X	X	X	X	X	X	X	X
Denver*	X	X	X	X	X	X	X	X	X	X	
Indianapolis**	X	X	X	X	X	X	X	X	X	X	X
Philadelphia***	X	X	X	X	X	X	X	X	X		
Seattle	X	X	X	X	X	X	X	X	X	X	

**Neighborhood level. **Crime data missing for one-half of the tracts. The tracts included represent slightly fewer than one-half of the Indianapolis population. ***No homicide or rape data.*

Exhibit A-3

Percent of Public Housing Units and Vouchers Reported by Housing Authority, 1998 and 2008

	1998		2008	
	Public Housing (%)	Vouchers (%)	Public Housing (%)	Vouchers (%)
Austin	96	99	99	NA
Chicago	63	99	54	NA
Cleveland	85	99	100	NA
Denver	98	99	99	NA
Indianapolis	74	84	97	NA
Philadelphia	50	99	87	NA
Seattle	95	99	89	NA

NA = data not available.

Appendix B

Exhibit B-1

Seven-City Longitudinal Sample, Crime and Housing Variables, 1998–2008

Year	1998	2000	2004*	2008**
Crimes per 1,000 people	78.9	71.4	65.9	64.3
Crimes per 1,000 housing units	186.2	168.4	155.4	151.6
Number of vouchers	35,351	51,819	45,528	72,894
Number of LIHTC units	34,594	41,491	57,373	72,281
Number of public housing units	73,181	78,206	58,179	57,207
Philadelphia	50	99	87	NA
Seattle	95	99	89	NA

LIHTC = low-income housing tax credit. NA = data not available.

** Voucher counts for 2004 are low because of missing data in Philadelphia and Seattle. **LIHTC units reported use 2007 totals.*

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Authors

Michael C. Lens is an assistant professor of urban planning at the University of California, Los Angeles, Luskin School of Public Affairs.

Ingrid Gould Ellen is a professor of public policy and urban planning at New York University, Wagner School of Public Service.

Katherine O'Regan is an associate professor of public policy at New York University, Wagner School of Public Service.

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