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, PD&R 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.*

Measuring Housing Quality in the Housing Choice Voucher Program With Customer Satisfaction Survey Data

Brent D. Mast
U.S. Department of Housing and Urban Development

The contents of this article are the views of the author and do not necessarily reflect the views or policies of the U.S. Department of Housing and Urban Development or the U.S. government.

Introduction

From 2000 through 2002, the U.S. Department of Housing and Urban Development (HUD) conducted a yearly national survey of Section 8 Housing Choice Voucher Program (HCVP) households, dubbed the Customer Satisfaction Survey (CSS).[1] This article describes the survey methodology and the resulting publicly available data set.[2]

---

[1] The official title of the survey is "The Section 8 Housing Quality and Customer Satisfaction Survey." The resulting data set of responses is sometimes referred to as the "CSA" for "Customer Satisfaction Answers." For consistency and brevity, we refer to both the survey and data set as the CSS.

[2] Researchers interested in obtaining survey responses may contact Brent Mast at Brent.D.Mast@hud.gov. Users must agree to standard HUD policies regarding use of household data.

During the 3 years of the survey, nearly one-half million households returned questionnaires, answering a wide variety of questions regarding the condition of their housing and neighborhoods. The large sample size was designed to provide yearly housing condition estimates in almost every public housing agency (PHA). Although most surveyed households reported high levels of satisfaction with their homes, some households also revealed serious deficiencies.

CSS data contain a large amount of household information, enabling researchers to study survey results for various demographic groups. For example, single heads of households with children tend to report lower housing quality and satisfaction relative to other households, particularly elderly households and those headed by nonelderly persons with disabilities. HCVP households in the western United States report higher levels of housing quality relative to voucher households in other regions. Reported housing quality also varies with PHA size.

This article presents an example of CSS data analysis using survey responses regarding crime and drug problems. West Virginia responses are averaged at the county level and are compared with county property and violent crime rates. Results indicate HCVP household perceptions about crime are more closely related to property crime than to violent crime.

The remainder of the article is organized as follows. The next section presents various aspects of the survey design and resulting data set. The third section discusses data validation, followed by the fourth section, which reviews past studies employing CSS data. Examples of CSS data analysis are presented in section five. The final section summarizes this article.

Survey Description

Sampling

HUD conducted a yearly survey of HCVP households for 3 calendar years from 2000 through 2002.[3] Based on pilot tests (Anderson, 1995; Building Research Council, 1998), HUD chose direct mail as the optimal method to distribute and collect survey questionnaires. The CSS's primary goal was to provide data on independent housing conditions to PHAs to help improve their HCVPs. The weighted responses represent a total of 4.8 million HCVP households—about 1.6 million households per year.

The sample was stratified by PHA and calendar year. Exhibit 1 reports sampling and response information by year. For most PHAs, a simple random sample of households was surveyed each year. All households were surveyed in smaller PHAs. Over the 3-year period, HUD mailed a total of 887,689 survey questionnaires and received 459,298 responses—an overall response rate of 51.7 percent. Response rates declined over time, varying from 62.2 percent in 2000 to 45 percent in 2002.

Response rates also varied across demographic groups. Exhibit 2 shows response rates for four household composition categories. Elderly households had the highest response rate at 68.2 percent.

---

[3] See Gray, Haley, and Mast (2009) for more detail on the survey design and results.

Nonelderly disabled households also had a relatively high response rate at 60.8 percent. Families with children had the lowest response rate at 45 percent.

Exhibit 3 reports response rates by race and ethnicity of household head. White non-Hispanic household heads had the highest response rate at 56.7 percent, followed by Hispanic household heads at 47.3 percent and black non-Hispanic household heads at 45.6 percent.

Given the differences in response rates, one might question how representative the survey data are of all HCVP households. Exhibit 4 reports household type percentages for all HCVP households and weighted survey responses in 2002. Families with children represent 51.5 percent of all HCVP households and 53.2 percent of weighted responses. Of all households, 13.7 percent have

Exhibit 1

Survey Response Rates

	2000	2001	2002	All Years
Number of surveys mailed	279,314	340,487	267,888	887,689
Number of responses	173,362	166,844	119,092	459,298
Response rate	62.2%	49.0%	45%	51.7%
Number of PHAs included in survey	2,409	2,448	2,378	
Total number of Section 8				
HCVP households	1,500,532	1,588,607	1,708,012	

HCVP = Housing Choice Voucher Program. PHA = public housing agency.
Source: Author's calculations using CSS data

Exhibit 2

Response Rates by Household Type

Household Composition	Responded (%)	No Response (%)
Families with children	45.0	55.0
Elderly*	68.2	31.8
Nonelderly with disabilities*	60.8	39.2
Other	52.9	47.1
All households	51.7	48.3

*Based on head or spouse; elderly are age 62 or older.
Source: Author's calculations using CSS data

Exhibit 3

Response Rates by Race and Ethnicity

| Race/Ethnicity of Household Head	Responded (%)	No Response (%)
White, non-Hispanic	56.7	43.3
Black, non-Hispanic	45.6	54.4
Hispanic	47.3	52.7
Other	51.4	48.6
All households	51.7	48.3

Source: Author's calculations using CSS data

an elderly household head or spouse, while 19.1 percent of weighted responses are from elderly designated households. Nonelderly households with disabilities account for 26.3 percent of all households and 18.6 percent of weighted responses to the survey.

Exhibit 5 reports corresponding frequencies by race and ethnicity of household head. Blacks comprise 42.9 percent of all household heads and 39.5 percent of weighted responses. Whites account for 39.1 percent of HCVP households and 40.5 percent of weighted responses. Hispanics represent 14.4 percent of households and 16.4 percent of weighted responses. Although the demographics of responding households do not perfectly mirror all HCVP households, they are very close.
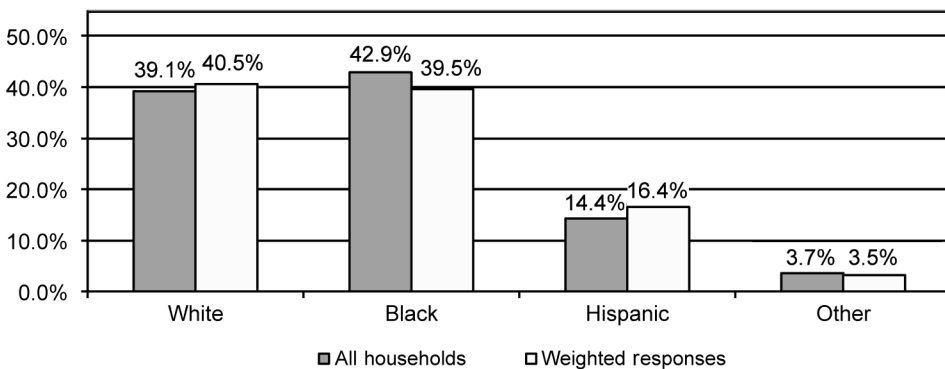
Exhibit 4

Household Type of All Voucher Households and Survey Respondents, 2002
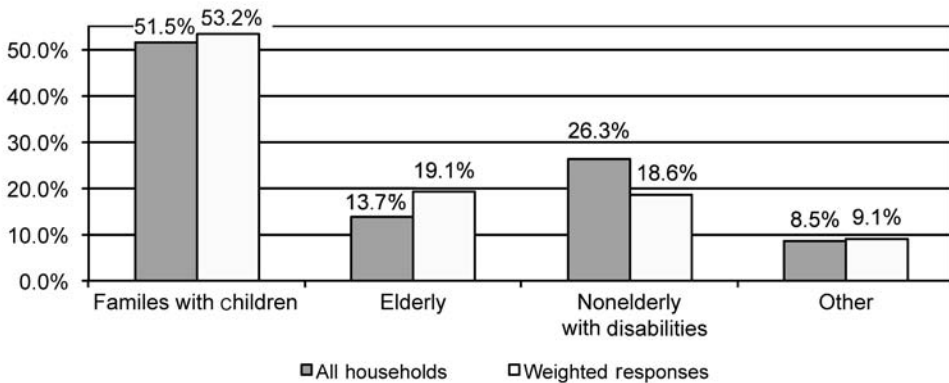
Source: Author's calculations using December 2002 Public and Indian Housing Information Center data and 2002 CSS data

Exhibit 5

Head of Household Race and Ethnicity for All Voucher Households and Survey Respondents, 2002

Source: Author's calculations using December 2002 Public and Indian Housing Information Center data and 2002 CSS data

Questionnaire

Most of the survey questions closely relate to items from HUD's Housing Quality Standards (HQS) inspection form for the HCVP.[4] Exhibit 6 reports a sample of 12 inspection items and their cor-

Exhibit 6

12 Housing Quality Standard Inspection Items and Corresponding Survey Questions

Source	Housing Quality Question
HQS*	Is the heating equipment capable of providing adequate heat to all rooms used for living?
CSS**	Does the heating system provide enough heat in every room?
HQS	Is the unit free from rats or severe infestation by mice or vermin?
CSS	Did you see any rats or signs of rats anywhere in your building or outside around the grounds this week?
CSS	Have you seen many cockroaches in your home this week?
HQS	Is there a working oven and a stove (or range) with top burners that work?
CSS	Does your kitchen have a working oven (not toaster oven)?
CSS	Do all the stove burners work?
HQS	Is there a kitchen sink that works with hot and cold running water?
HQS	Is there a working tub or shower with hot and cold running water in the unit?
CSS	Is there hot and cold running water at each kitchen and bathroom sink, tub, and shower?
HQS	Is plumbing free from major leaks or corrosion that causes serious and persistent levels of rust or contamination in the drinking water?
CSS	Is water leaking today from any kitchen or bathroom sink or drain or pipe?
CSS	Does the tap water have a problem with color or bad odor?
HQS	Is the room free from electrical hazards?***
CSS	Is all the building's wiring in your home enclosed in walls or metal coverings?
CSS	Do all electrical outlets have cover plates?
CSS	How many times have fuses blown or circuit breakers tripped in the past 3 months?
HQS	Is the ceiling sound and free from hazardous defects?***
HQS	Are the walls sound and free from hazardous defects?***
HQS	Is the floor sound and free from hazardous defects?***
CSS	Do you see any walls, ceilings, or floors with serious problems such as sagging, leaning, buckling, or large holes?
CSS	Is there mildew, mold, or water damage on any wall, floor, or ceiling?
HQS	Are all windows and doors that are accessible from the outside lockable in each room?
CSS	Do all outside doors have locks that work?
CSS	Do all windows have locks that work?
HQS	Are the site and immediate neighborhood free from conditions that would seriously and continuously endanger the health or safety of the residents?
CSS	Are the yards, playground, and off-street parking safe?
CSS	Do you think that crime or drugs are a big problem in your neighborhood?

HQS = Housing Quality Standards.
*Source: HUD HQS Inspection Form; available at http://www.hudclips.org
**Source: HUD CSS survey instrument reprinted in Gray, Haley, and Mast (2009)
***Inspection items for every room in rental unit.

---

[4] HCVP Housing Quality Standards are presented in chapter 10 of the *Housing Choice Voucher Guidebook* available at http://www.hud.gov/offices/adm/hudclips/guidebooks/7420.10G/7420g10GUID.pdf. The inspection form is available at http://www.hud.gov/offices/adm/hudclips/forms/files/52580-a.pdf. The survey questionnaire is reprinted in Gray, Haley, and Mast (2009).

responding questions from the survey. One major difference between the inspection form and the survey is the manner in which the respondents report problems by room. For example, the inspection form has separate items for electrical problems in every room. The survey questionnaire, on the other hand, asks if the unit has electrical problems anywhere in unit.

The survey, on the other hand, provides more detail on some other problems. For instance, the inspection form has one item flagging "rats or severe infestation by mice or vermin." The survey has two related questions: one for rat problems and another for cockroach infestations.

Supposedly, at the time a unit passes inspection (either initial inspection or annual reinspection), it should be free of HQS-type problems. Note, however, that survey dates vary from inspection dates. Thus, an HQS-type problem indicated on the survey does not necessarily imply inadequate inspection.

HCVP households are required to promptly report housing problems to landlords and PHAs. Reported HQS violations are to be corrected within 30 days, unless the PHA issues a waiver for special circumstances. The survey, however, does not identify when problems occur. Furthermore, it does not ask if or when problems are reported to PHAs or landlords. In short, the survey cannot identify with certainty HQS violations.

Weighting

Weights were created to make survey estimates representative of PHAs. Weights equal the number of PHA HCVP-occupied units divided by the number of survey responses in a given year. For instance, in 2001, the Plant City, Florida PHA had 169 occupied units and 31 survey responses. The weight for the 2001 Plant City survey responses equals 169/31 or 5.45.

Demographic Information

In addition to the survey questionnaire responses, a rich set of household demographic information is available in the CSS. This information was adopted from HUD's Multifamily Tenant Characteristics System/Public and Indian Housing Information Center (MTCS/PIC) data systems.

Examples of household information include race, age, ethnicity, and disability status of household members; family size; household income; and metropolitan status.

Geographic information on households participating in the CSS is available at the census tract level and above (county, state, and region).[5] As with other HUD data sets, census tract IDs are not reported for tracts with fewer than 10 HCVP households or household addresses that could not be accurately geocoded.

Data Validation

Pretest survey results correlated highly with onsite inspection data (Anderson, 1995; Building Research Council, 1998, reviewed by Gray, Haley, and Mast, 2009). The only independent data

---

[5] Researchers requesting census tract IDs must demonstrate that their research requires this information.

available to validate results from the nationwide survey are from HCVP households participating in the American Housing Survey (AHS).[6]

As discussed by Gray, Haley, and Mast (2009) and Buron, Kaul, and Patterson (2003), differences in the survey methodology and question wording make comparison of the AHS with the CSS difficult. The two most similar questions ask residents to rate their home and neighborhood on a scale of 1 to 10.

Exhibit 7 reports 2001 CSS estimates along with AHS estimates for occupied rental units. AHS estimates are reported for voucher households and all other rental units. AHS estimates for HCVP households are lower relative to estimates for other home renters. The mean home rating is 7.43 for voucher units, compared with 7.48 for other rented homes. Mean AHS neighborhood ratings are 7.11 for HCVP households and 7.46 for other renters.

Despite substantial differences in survey methods and sample sizes, HCVP household estimates from both surveys are similar. For both questions (rating home and rating neighborhood), mean CSS estimates are slightly higher than estimates for HCVP households participating in the AHS. The 2001 AHS mean home rating for HCVP households is 7.43, compared with 7.50 for the CSS. The HCVP mean neighborhood rating is 7.11 for the AHS and 7.26 for the CSS.

Because of differences in sample size, AHS standard errors are much larger. The AHS mean home rating 95 percent confidence interval is 7.18 to 7.68, compared with 7.48 to 7.52 for the CSS. The mean neighborhood rating 95 percent confidence interval is 6.84 to 7.37 for the AHS and 7.24 to 7.28 for the CSS.

Exhibit 7

2001 American Housing Survey and CSS Home and Neighborhood Ratings

| | 2001 Household Sample | | | | | |
| | CSS—
Voucher Households | | AHS—
Voucher Households | | AHS—
Other Rental Units | |
	Mean (Std. Error)	Sample Size	Mean (Std. Error)	Sample Size	Mean (Std. Error)	Sample Size
Home rating on a scale of 1 to 10	7.50(.01)	161,205	7.43(.13)	339	7.48(.02)	12,195
Neighborhood rating on a scale of 1 to 10	7.26(.01)	160,266	7.11(.13)	337	7.46(.02)	12,171

AHS = American Housing Survey.

Source: Author's calculations using 2001 AHS data and CSS data

Literature Review

Gray, Haley, and Mast (2009) conduct the most thorough analysis of the CSS, providing much detail on the survey methodology housing quality estimates. They report wide variation in survey outcomes across demographic groups and PHAs.

---

[6] Information on AHS data and publications is available at http://www.huduser.org/datasets/ahs.html.

Other researchers have used CSS data for more narrow research purposes. Buron, Kaul, and Patterson (2003) compare preliminary CSS results for 2001 with a matched sample of unassisted households from the AHS. They estimate lower housing quality for HCVP households relative to similar unassisted families, but they caution that their results may be driven by differences in survey methodology and question wording.

Early (2006) uses CSS responses to control for quality while computing a housing price index. Buron and Patrabansh (2008) study the relationship between CSS neighborhood quality responses and census data, finding little correspondence.

Analysis

The analysis in this section demonstrates a potential use of the CSS using responses to a question-naire item asking households to indicate if crime or drugs are "a big problem in (their) neighbor-hood." Weighted frequency responses are summarized in exhibit 8. Of HCVP households, 45.1 percent are estimated to perceive no crime or drug problems.

An estimated 19.9 percent of households do not know if their neighborhood has a crime or drug problem. The wording of this response category is problematic. The analysis in this article treats "don't know" responses as households with no opinion (that is, the respondents neither agree nor disagree that crime or drugs are a problem). Perhaps responses in this category should be treated the same as the 1.9 percent of households with missing data.

An estimated 22.6 percent of households report somewhat of a problem with crime or drugs. The remaining 10.6 percent are estimated to perceive a major problem with crime or drugs in their neighborhood.

CSS county identifiers allow for comparison of survey crime estimates with FBI county crime esti-mates from the Uniform Crime Reports.[7] This article presents such a comparison for West Virginia counties. Three-year average property (burglary, larceny, and motor vehicle theft) and violent (murder, rape, robbery, and assault) crime rates per 10,000 residents are calculated using data for 2000 through 2002.

Exhibit 8

CSS Estimates of Crime and Drug Problems in Housing Choice Voucher Neighborhoods

CSS Survey Response	Weighted Percent of Households (%)	Std. Error
No response	1.93	0.05
No problem	45.08	0.18
Don't know	19.84	0.15
Some problem	22.57	0.16
Big problem	10.58	0.11

Source: Author's calculations using CSS data

---

[7] http://www.fbi.gov/ucr/ucr.htm.

Three-year weighted county averages are also calculated for the crime and drug problem responses, recoding them as integer data. "No problem" responses are set to 1. "Don't know" responses are recoded as 2. "Somewhat of a problem" responses are set to 3, and "big problem" responses are set to 4. This recoding allows county crime and drug problems to be measured on an ordinal scale of 1 to 4.

Exhibit 9 reports summary statistics for the three crime measures. Measuring crime and drugs as a problem on a scale of 1 to 4, the county averages range from 1.13 to 2.14, with a mean of 1.62. Property crime rates range from 54.71 to 453.22, with a 159.87 mean. Violent crime rates range from 6.89 to 52.36, with a 24.12 mean.

Exhibit 10 reports Pearson correlation coefficients for the county crime measures. West Virginia HCVP household perceptions of crime and drug problems are more strongly related to property crime than violent crime. The correlation coefficient of the survey measure with the property crime rate is .55. The correlation coefficient of the survey measure with the violent crime rate is .37. Both coefficients are statistically significant at the .01 level.

Exhibit 11 depicts a West Virginia county map with quartile indicators for the survey measure and the property crime rate. Exhibit 12 maps quartiles for the survey measure and violent crime rate. Of the 55 counties in West Virginia, 26 share the same quartile for the survey measure and property crime rate; 23 counties have the same quartile for the survey measure and violent crime. Only 15 counties are in the same quartile for all three crime measures. For example, Kanawha County is

Exhibit 9

Summary Statistics for West Virginia County Crime Measures

	CSS—Crime and Drug Problem on a Scale of 1 to 4	Property Crime Rate	Violent Crime Rate
Minimum	1.125	54.712	6.888
25th percentile	1.438	103.386	16.194
50th percentile (median)	1.640	139.412	23.165
Mean	1.623	159.874	24.120
75th percentile	1.845	201.286	31.388
Maximum	2.144	453.218	52.359

Source: Author's calculations using CSS and Uniform Crime Reports data for 2000–02

Exhibit 10

Correlation Coefficients for West Virginia County Crime Measures

	CSS—Crime and Drug Problem on a Scale of 1 to 4	Property Crime Rate	Violent Crime Rate
CSS—Crime and drug problem on a scale of 1 to 4	1	.552(.001)	.373(.005)
Property crime rate	.552(.001)	1	.591(.001)
Violent crime rate	.373(.005)	.591(.001)	1

*Note: P-values in parentheses.*

Source: Author's calculations using CSS and Uniform Crime Reports data for 2000–02

in the top quartile for all three crime measures, while Brooke County is in the lowest quartile for all measures.

A distinct pattern of high estimated perceptions of crime and drug problems for HCVP households exists in bordering counties from Cabell to Randolph. The high crime pattern is also apparent to a lesser degree for property and violent crime rates.
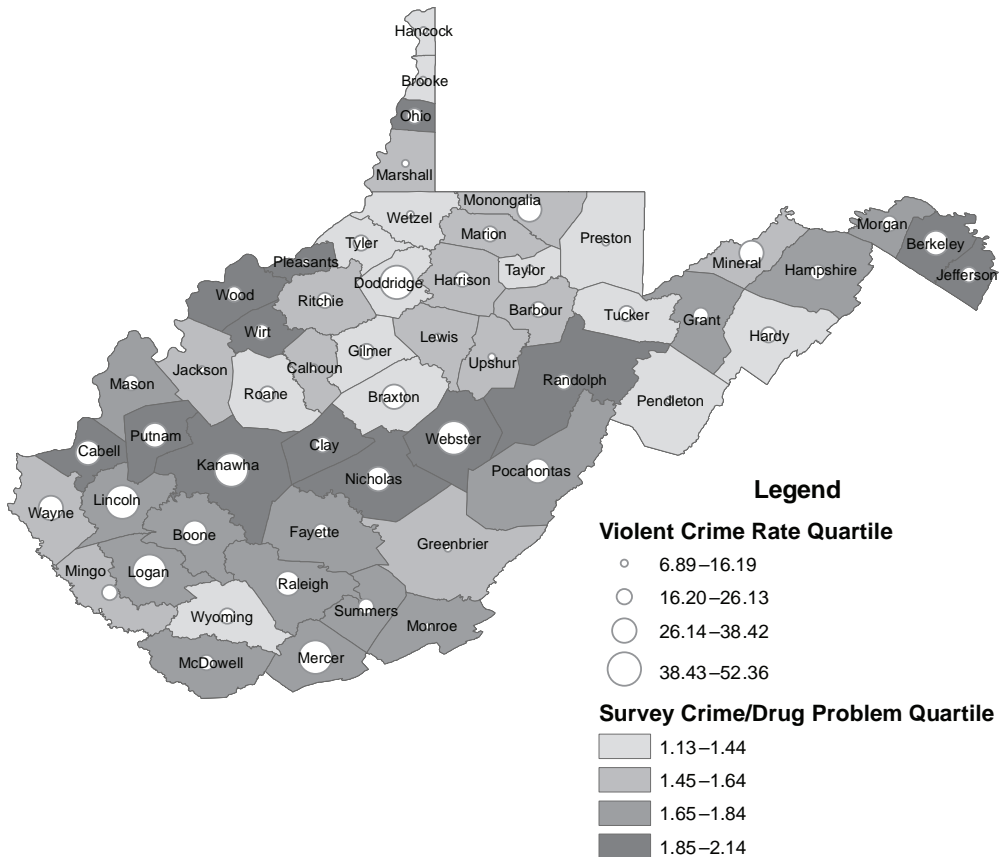
Exhibit 11

Map of West Virginia County CSS Crime Measure and Property Crime Rate
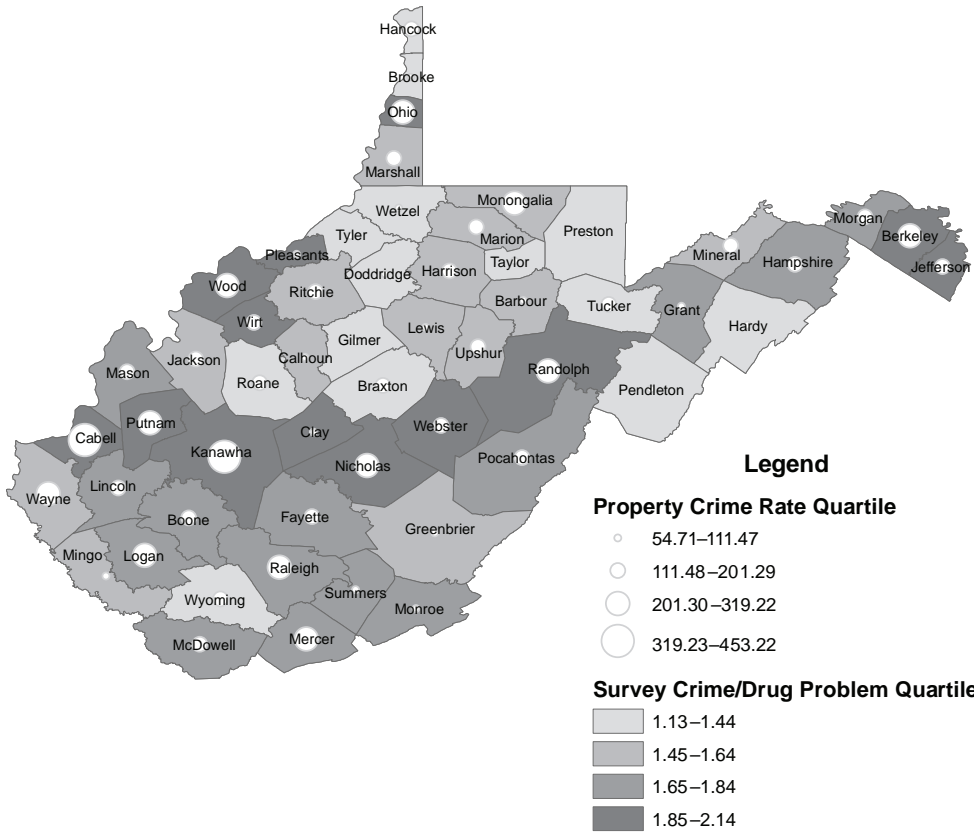
Source: Author's calculations using CSS and Uniform Crime Reports data for 2000–02

Exhibit 12

Map of West Virginia County CSS Crime Measure and Violent Crime Rate

Conclusions

During calendar years 2000 through 2003, HUD received survey responses from nearly one-half million households to questions concerning housing conditions in the Section 8 Housing Choice Voucher Program.

In this yearly national survey, dubbed the CSS, the data contain large amounts of household and neighborhood information, enabling researchers to study housing and neighborhood conditions for various demographic groups.

This article presents an example of CSS data analysis using West Virginia county-level data. Results of the analysis indicate HCVP household crime perceptions are more closely related to property crime than to violent crime.

Acknowledgments

Author

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

References

Anderson, James R. 1995. *Consolidation Report: HQS Section 8 Mail Survey Study*. Report prepared for the U.S. Department of Housing and Urban Development, Office of Policy Development and Research. Washington, DC: U.S. Department of Housing and Urban Development.

Building Research Council. 1998. *Resident Assessment of Housing Quality: Lesson from Pilot Surveys*. Report prepared for the U.S. Department of Housing and Urban Development, Office of Policy Development and Research. http://www.huduser.org/publications/pubasst/quality.html.

Buron, Larry, Bulbul Kaul, and Rhiannon Patterson. 2003. *Quality of Housing Choice Voucher Housing*. Report prepared for the U.S. Department of Housing and Urban Development. Washington, DC: U.S. Department of Housing and Urban Development.

Buron, Larry, and Satyendra Patrabansh. 2008. "Are Census Variables Highly Correlated With Housing Choice Voucher Holders' Perception of the Quality of Their Neighborhoods?" *Cityscape* 10 (1): 157–184.

Early, Dirk W. 2006. *Metropolitan Area Cost of Rental Housing Indices Using the Customer Satisfaction Survey: Final Report*. Report prepared for the U.S. Department of Housing and Urban Development, Office of Policy Development and Research. Washington, DC: U.S. Department of Housing and Urban Development.

Gray, Robert W., Barbara A. Haley, and Brent D. Mast. 2009 (January). Tell Us About Your Home: Three Years of Surveying Housing Quality and Satisfaction in the Section 8 Housing Choice Voucher Program. Unpublished manuscript. Washington, DC: U.S. Department of Housing and Urban Development, Office of Policy Development and Research.