Cityscape

A Journal of Policy Development and Research

THE HISPANIC HOUSING EXPERIENCE IN THE UNITED STATES, PART II
VOLUME 23, NUMBER 3 • 2021

U.S. DEPARTMENT OF HOUSING AND URBAN DEVELOPMENT

PD&R

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

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Guest Editor's Introduction

Hispanic Housing Experience in the United States Part II—Hispanic Homeownership and Rental Access Quality, Gentrification, and the Resulting Impact on Neighborhood Context

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The views expressed in this article are those of the authors and do not represent the official positions or policies of the Office of Policy Development and Research, the U.S. Department of Housing and Urban Development, or the U.S. government.

Introduction

The access of Hispanics—the largest ethnic-racial minority in the United States—to housing has been understudied. A *Cityscape* call for papers to fill that gap resulted in more publishable submissions than would fit in one symposium. Therefore, in the last issue, George Carter III presented "The Hispanic Housing Experience in the United States, Part I," which focused on homelessness, segregation, anti-immigrant ordinances, and mobility.

In this issue, our symposium (Part II) focuses on one old theme (segregation) but also several new ones: assisted housing, homeownership, and the transition of wealth and real property between generations.

Background

Low-income Hispanic renters face particular hardship in the United States. The Worst Case Housing Needs 2019 Report to Congress found that between 2017 and 2019, 24.4 percent of Hispanic households met the criteria for worst needs, either paying more than one-half of income toward housing costs, living in severely inadequate conditions, or both (Watson et al., 2020). Although Hispanic households constitute about 18 percent of U.S. Department of Housing and Urban Development (HUD)-assisted households, a number similar to their overall share of the population, nearly one-fourth of Hispanics are qualified to receive HUD assistance. Compared with their measure of the applicant pool, however, Hispanics are proportionally underrepresented in obtaining certain forms of rental assistance. According to the 2019 American Housing Survey (AHS), 36 percent of Hispanic households spend 35 percent or more of their incomes on housing compared with only 26 percent of non-Hispanic households (U.S. Census Bureau, 2020). To the extent that we can measure adequate housing quality, research indicates that Hispanics experience severely inadequate housing at double the rate of non-Hispanics (2 percent versus 1 percent; 2019 AHS). Even when attempting to contact public housing authorities for assistance, Hispanics face potential discrimination in the form of less friendly greetings and being less likely to be addressed by name (Einstein and Glick, 2017).

In Part I, Carter (2021) pointed out that Hispanic households in the United States are more likely to be renters (52 percent) than are U.S. households overall (36 percent), and 36 percent of new households are Hispanic (NAHREP, 2021). Even controlling for income, family structure, and other characteristics, Hispanics are less likely to own a home than are Whites (Flippen, 2010).

Symposium Articles

Along the U.S.-Mexico border are communities of Hispanics living in settlements of varying informality, known as *colonias*. *Colonias* not only frequently lack basic services such as plumbing, utilities, and other services, but their residents may lack clear property titles even though many families have lived on the land for generations. Keith Wiley, Lance George, and Sam Lipshutz (2021) investigate access to mortgages in *colonias* in connection with Fannie Mae and Freddie Mac's Duty to Serve policy obligations. Fannie Mae and Freddie Mac must "facilitate a secondary market for mortgages on housing for very low-, low-, and moderate-income families" in underserved markets, one of which is rural housing (FHFA, 2021). In examining Home Mortgage Disclosure Act (HMDA) data, the authors found low levels of lending throughout those sections of the border area.

Rocio Sanchez-Moyano (2021) compares White and Hispanic home purchasing patterns. Controlling for the financial, demographic, and mortgage characteristics of the homebuyer, the author found that Hispanic homebuyers still tend to purchase homes in neighborhoods with more economic disadvantages. Compared with Whites, Hispanics were more likely to purchase homes in high-poverty and low-income neighborhoods even when otherwise qualified to purchase homes in higher opportunity neighborhoods. Unlike Whites, however, Hispanic loan applicants with a co-borrower tend to purchase in better opportunity neighborhoods. Although HMDA data do not contain information about the attitudes of homebuyers, Sanchez-Moyano explores the structural sorting of Hispanic homebuyers. The data show that Hispanic homebuyers may be more likely to purchase in majority-Hispanic neighborhoods but are also more likely to purchase in majority-Black neighborhoods when few predominately Hispanic neighborhoods are available.

Dowell Myers and David Flores Moctezuma (2021) ponder the future of predominantly Hispanic neighborhoods in Los Angeles (L.A.). First, the authors analyzed the age structure of Hispanics, their ability to purchase a home, and whether or not Hispanics are income-qualified to replace White homeowners who are considerably older. Second, the authors analyzed Hispanic homeowners in two historically Hispanic East Los Angeles neighborhoods and the rise in the number of White and Asian homeowners in those areas. The analysis found that although Hispanics may be rising as a share of total homeowners nationally, the trend is different in East L.A., where Hispanics are purchasing homes in formerly White areas but may be unable to afford homes in traditionally Hispanic neighborhoods.

Anna Maria Santiago and Joffré Leroux (2021) also focus on homeownership. To support homeownership goals, the authors focused on housing counseling agencies across the United States that provide a wide range of services, including preparing households with the financial skills to own a home. In "*Hogar Dulce Hogar?*: The Experiences of Low-Income Latinx Homebuyers in Denver," they examine Hispanic households that formerly participated in public housing that leave for homeownership, about one-third of whom participated in the Denver Housing Authority's Homeownership Program (HOP). HOP provided households with education on money management, credit management, financial assistance, and more. The authors found that Hispanic households that participated in HOP received several benefits. Those households held onto their homes for an average of 12 years—about 2 years longer than Hispanic households that did not participate in HOP. HOP participants were less likely to use risky loan products. Hispanic HOP participants purchased homes that appreciated more on average than those of Hispanic households that did not participate in the counseling program, although the appreciation rate for those homes was less than for the Denver region overall.

Kirk McClure and Alex Schwartz (2021) review how low-income Hispanic renters fare in the Housing Choice Voucher (HCV) program—HUD's largest rental assistance program, comprising just over one-half of all HUD-assisted households. Hispanic renters make up about 18 percent of all HCV households (Din and Helms Garrison, 2021). McClure and Schwartz examined Hispanic HCV households moving between neighborhoods with varying degrees of opportunity, as defined by an index from HUD's Affirmatively Furthering Fair Housing data. They found that Hispanic HCV households are more likely to reside in lower opportunity neighborhoods. When moving, many Hispanic HCV households are likely to move to neighborhoods with similar or less opportunity.

Sandra Newman and C. Scott Holupka (2021) examine variation in the takeup rates of Hispanics in different types of HUD low-income rental assistance. Large differences exist in the geographic availability of those forms of aid—for example, California has very little public housing. Newman and Holupka found overrepresentation among Hispanics in public housing, but they found the opposite in housing voucher programs. Despite rental-assisted Hispanic households having larger families on average, the authors found that Hispanic households have housing units 73 square feet and 93 square feet smaller than White and Black rental-assisted households, respectively. Hispanics have the greatest chance at a larger housing unit when enrolled in the HCV program, in which, however, they are underrepresented. Despite the disadvantage in assistance, Hispanic households still reported higher housing unit and neighborhood ratings than did Black or White households.

In 2020, 16 disasters occurred, which cost more than $1 billion in damage each, totaling nearly $50 billion (JCHS, 2020). Because the cost and number of declared disasters are rapidly increasing, disaster preparedness is becoming more important than ever before. As Samantha Friedman, Mayuko Nakatsuka, Elizabeth Fussell, and Recai Yucel (2021) reveal, Hispanic households are often more likely to live in areas that are vulnerable to such disasters; however, there is a lack of recent literature on Hispanic disaster preparedness. Friedman and her colleagues reviewed studies that have attempted to analyze the preparedness of Hispanic households in case of disaster, but their literature survey reports mixed results. The authors conducted bivariate and multivariate analyses on household characteristics using the 2017 AHS to assess the preparedness of Hispanics compared with other racial and ethnic groups. The research examines household resources, such as emergency funds, the presence of a generator, and other factors that affect a family's ability to weather a disaster. Overall, the authors found that preparedness among Hispanics is lower than among White households; however, a wide variance exists between factors when compared with other racial and ethnic groups.

Dr. Ernesto Lopez-Morales from the University of Chile provides an international perspective. He contrasts *colonias* in the United States with *campamentos* in Chile—informal settlements populated by immigrants that lack basic services and utilities—exploring similarities and differences between the two settlement types. Like the United States, Chile has a rental voucher program (code DS52), which also seeks to provide housing to low-income households. Dr. Lopez-Morales noted major differences in that the subsidy is capped below actual market rates and that Chile's "DS52 voucher poorly assists deprived tenant households in finding a home" (Lopez-Morales, 2021). Although many social situations and programs in the United States have comparisons in Chile, not all programs carry over. For example, although subsidy programs exist in Chile, no programs seem to be available for counseling households on budgeting, homeownership, financial literacy, and other soft skills for maintaining a home.

The purpose of this symposium is for policymakers, researchers, and others to understand rental assistance, homeownership, and disaster preparedness among Hispanics. Although the effects of housing counseling, rental assistance, and other housing programs and policy are widely studied and debated, narrowing the focus to Hispanics to understand how counseling works *for them* is important. As Hispanics continue to grow as the largest ethnic/racial group in this country, and as their countries of origin and length of time in the country continue to evolve, it will continue to be important to contextualize housing policy issues specifically for Hispanics and pay careful attention to whether the nation's housing programs are effective in serving them.

Acknowledgments

We thank the authors of the research articles for pioneering contributions to this literature, the authors of the reaction articles for contributing nuanced perspectives, the blind peer reviewers, and the editorial staff of *Cityscape*. We also thank George R. Carter III for his work on Part I of this series and Mark Shroder for his guidance to the finish line of this process.

Guest Editors

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References

Carter, George III. 2021. "Guest Editor's Introduction: *Cityscape* Symposium on the Hispanic Housing Experience in the United States, Part I—Hispanic Homelessness, Residential Segregation, and the Neighborhood Context of Hispanic Housing Experiences," *Cityscape* 23 (2): 109–113.

Din, Alexander, and Veronica Helms Garrison. 2021. "The Geography of HUD-Assisted Households," *Cityscape* 23 (2): 409–416.

Einstein, Katherine Levine, and David M. Glick. 2017. "Does Race Affect Access to Government Services? An Experiment Exploring Street-Level Bureaucrats and Access to Public Housing," *American Journal of Political Science* 61 (1): 100–116.

Federal Housing Financing Agency (FHFA). 2021. "Duty to Serve Program." https://www.fhfa.gov/PolicyProgramsResearch/Programs/Pages/Duty-to-Serve.aspx.

Flippen, Chenoa A. 2010. "The Spatial Dynamics of Stratification: Metropolitan Context, Population Redistribution, and Black and Hispanic Homeownership," *Demography* 47 (4): 845–868.

Friedman, Samantha, Mayuko Nakatsuka, Elizabeth Fussell, and Recai Yucel. 2021. "Hispanic Disaster Preparedness in the United States, 2017: Examining the Association with Residential Characteristics," *Cityscape* 23 (3): 207–241.

Joint Center for Housing Studies (JCHS) of Harvard University. 2020. "The State of the Nation's Housing 2020." https://www.jchs.harvard.edu/sites/default/files/interactive-item/files/Harvard_JCHS_State_of_the_Nations_Housing_2020_Key_Facts.pdf.

López-Morales, Ernesto. 2021. "The Hispanic Housing Experience: A Perspective from Chile," *Cityscape* 23 (3): 243–247.

McClure, Kirk, and Alex Schwartz. 2021. "Movement of High-Opportunity and Racial/Ethnic Integration for Hispanics in the Housing Choice Voucher Program," *Cityscape* 23 (3): 139–162.

Myers, Dowell, and David Flores Moctezuma. 2021. "Hispanic Homeownership Advancement through Recession and Boom: Tracking Cohort Aging and Replacement with 5-Year American Community Survey Data in the United States, Los Angeles, and a Gentrifying District," *Cityscape* 23 (3): 69–94.

National Association of Hispanic Real Estate Professionals (NAHREP). 2021. "2020 State of Hispanic Homeownership Report." https://nahrep.org/downloads/2020-state-of-hispanic-homeownership-report.pdf.

Newman, Sandra, and C. Scott Holupka. 2021. "Hispanic Families in Assisted Housing," *Cityscape* 23 (3): 163–205.

Sanchez-Moyano, Rocio. 2021. "Achieving Spatial Equity Through Suburban Homeownership? Neighborhood Attributes of Hispanic Homebuyers," *Cityscape* 23 (3): 41–67.

Santiago, Anna Maria, and Joffré Leroux. 2021. "*Hogar Dulce Hogar?* [Home Sweet Home?]: Prepurchase Counseling and the Experiences of Low-Income Latinx Homeowners in Denver," *Cityscape* 23 (3): 95–137.

U.S. Census Bureau. 2020. "2019 American Housing Survey." https://www.census.gov/programs-surveys/ahs.html.

Watson, Nicole Elsasser, Barry L. Steffen, Marge Martin, and David A. Vandenbroucke. 2020. *Worst Case Housing Needs: 2019 Report to Congress*. Washington, DC: U.S. Department of Housing and Urban Development, Office of Policy Development and Research. https://www.huduser.gov/PORTAL/publications/worst-case-housing-needs-2020.html.

Wiley, Keith, Lance George, and Sam Lipshutz, 2021. "Colonias Investment Areas: A More Focused Approach," *Cityscape* 23 (3): 9–39.

Colonias Investment Areas: A More Focused Approach

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Abstract

The Federal Housing Finance Agency's (FHFA) Duty to Serve (DTS) regulations require Fannie Mae and Freddie Mac (the Government-Sponsored Enterprises, or GSEs) to engage in efforts that increase liquidity in home mortgage lending markets for select rural, high-need areas. Unincorporated communities along the U.S.-Mexico border, known as "colonias," are one of these high-need areas. Colonias are informal housing development communities, usually with majority Hispanic populations, that experience extremely high poverty rates and substandard living conditions. These communities may lack drinking water, sewer treatment services, paved streets, high-quality housing, and standard mortgage finance. As a result, they contain some of the worst living conditions in the United States. Policies like DTS seek to ameliorate through better access to affordable mortgage financing.

This paper explores an effort, supported by Fannie Mae, to plan, target, and evaluate their DTS efforts in colonias. The approach focuses on the concept of "Colonias Investment Areas," which are census tracts containing government recognized colonias. Activities in these Colonias Investment Areas will then be viewed as impacting colonias. A review of housing and mortgage lending data describes Colonias Investment Areas, noting their differences and their commonalities. The data show there is still a need for more affordable home lending options in areas with substandard housing. The ensuing policy discussion details the strengths and limitations of the colonias investment approach and challenges, such as limited housing and reliance on informal self-help construction, that could hinder efforts. Policies that support assisted self-help housing and small-dollar lending might be part of an effective solution.

Introduction

The Housing and Economic Recovery Act of 2008 established an obligation for Government-Sponsored Enterprises (GSEs) to increase liquidity in underserved housing markets, including high-need regions. High-need regions, which often contain disproportionately large rural and minority populations, experience chronic economic distress and high poverty rates. Colonias, unregulated developments with substandard living conditions near the U.S.-Mexico border, make up one of these regions.

As shown in exhibit 1, the region within 150 miles of the U.S.-Mexico border includes substantial parts of four states, with most border region counties having majority Hispanic populations. The region is home to more than 33 million people and has experienced rapid growth over the last 40 years; its population has increased 82 percent since 1980, nearly twice as fast as the 43 percent growth rate for the U.S. population overall. This growth, coupled with low wages and a lack of affordable housing, fueled the formation of colonias, which now comprise at least 2,459 communities. Colonias often contain substandard living conditions and extremely high poverty rates. Thirty-three of the 109 counties near the Mexico border are persistently poor,[1] meaning they have experienced poverty rates of 20 percent or more for 3 consecutive decades. Twenty-seven of these persistent poverty counties have majority Hispanic populations (see exhibit 1), and they are home to more than 90 percent of all recognized colonias. At the same time, access to affordable home financing, which could help lower owner costs and facilitate improved neighborhood conditions, is rare. Policies like Duty to Serve (DTS) aim to address this need by improving access to affordable finance.

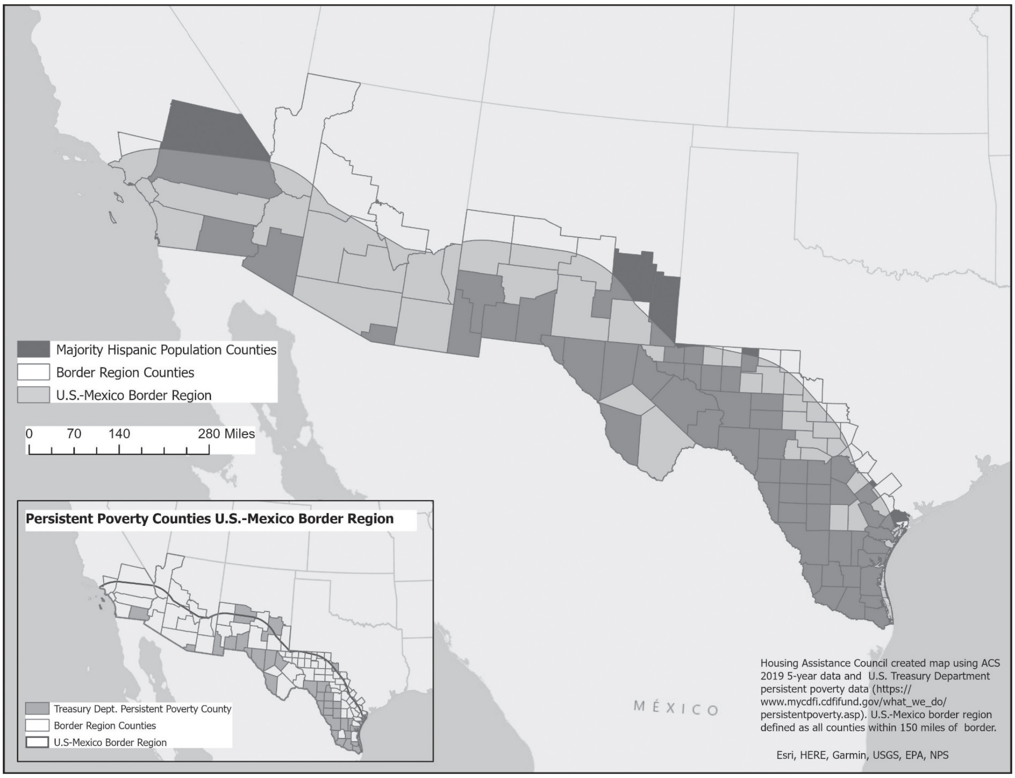
This paper is part of a project to better target DTS efforts to impact colonias. The research involved identifying government-recognized colonias, locating them geographically, and aggregating this information to identify all colonia-containing census tracts, referred to as “Colonias Investment Areas.” Fannie Mae will use these Colonias Investment Areas for planning, targeting, and evaluating its DTS work. By focusing efforts on Colonias Investment Areas, Fannie Mae would help ensure investments are either directly or indirectly affecting colonias and nearby colonia-like developments. Using census tracts represents a balanced approach—using the larger county geography would be too broad and using small neighborhood boundaries would be too specific. A database of Colonias Investment Areas, containing records for each of the four states bordering Mexico, brings this information together in one location.[2]

[1] As of March 3, 2021, the Department of Treasury makes a list of persistent poverty counties available for download at https://mycdfi.cdfifund.gov/what_we_do/persistentpoverty.asp.

[2] As of February 27, 2021, this information is available at the following Fannie Mae website: https://colonias-investment-areas.carto.io/.

Exhibit 1

United States-Mexico Border Region



USGS = United States Geological Survey. EPA = United States Environmental Protection Agency. NPS = The National Park Service.

Background

U.S.-Mexico Border Region

In the United States, the term "colonias" has been applied to unincorporated communities in California, Arizona, New Mexico, and Texas along the U.S.-Mexico border characterized by high poverty rates and substandard living conditions. The overwhelming majority of colonia residents are Hispanic, particularly in Texas, where they make up an estimated 96 percent of the colonia population (Federal Reserve Bank of Dallas, 2015). Colonias in the other three border states are less homogenous, however. In practical terms, colonias are defined by what they lack, such as potable water, water and wastewater systems, paved streets, and standard mortgage financing.

Despite being categorized together, colonias vary extensively within the border region, from small clusters of homes located near agricultural employment opportunities to established communities whose residents commute to nearby urban centers (Núñez-Mchiri, 2009). Colonias also have diverse histories. Some emerged in the last 50 years, but others have existed since the 19th century. The unmet need for affordable housing was a key factor driving the demand for homes in colonia developments in both recent and historic colonias (Federal Reserve Bank of Dallas, 1996), but various factors led to colonia development within each border state. Because colonias in Texas are more visible than those in other states, their characteristics tend to guide common perceptions and government policy (Mukhija and Monkkonen, 2006).

Informal Housing Development

Research has shown that similar substandard developments occur in other parts of the United States. Ward and Peters (2007) classify colonias as a type of peri-urban, "informal" housing development. In slightly different forms, this peri-urban development occurs in areas far from the U.S.-Mexico border region, such as Greensboro, North Carolina. Ward and Peters' research also details the differences in housing that can be seen even among border colonias—manufactured homes, site-built, etc. However, the term "colonias" is the common reference point in that it refers to informal, substandard housing developments located near the U.S.-Mexico border.

Lack of Regulations/Oversight

Colonias largely resulted from lax land regulations, particularly over the last few decades (Donelson and Holguin, 2001). For much of the 20th century, county governments lacked the power to regulate the subdivision of land that lies outside the jurisdiction of city governments. Without these controls in place, landowners could subdivide and sell their property without the necessary infrastructure (Parcher and Humberson, 2007).

The contract-for-deed system also facilitated the proliferation of colonias, particularly in Texas. The buyer makes payments directly to the developer through a contract for deed, and the land title remains with the developer until the amount is paid in full. These arrangements often involve high-interest rates, and many are not recorded with the county clerk (Federal Reserve Bank of Dallas, 1996). If a single payment is missed, the developer may foreclose on the property, and the buyer will lose their entire investment (Parcher and Humberson, 2007).

State Policy Response

State laws enacted over the past 20 to 30 years have attempted to end the formation of colonias. These laws, such as Texas's Model Subdivision Rules, require certain infrastructure, like water and wastewater systems, to be in place for subdivided land. Research exploring the impact of these policies on lower-cost developments finds improved infrastructure but a continuation of substandard housing units (Durst and Ward, 2015). In addition, these communities still lack access to affordable finance, and there is considerable turnover in lot ownership (Olmedo and Ward, 2016). Although these new developments are no longer officially considered colonias, they are in many ways the same and are often located near state-recognized colonias (Durst 2016).

Underlying Problems

A lack of affordable housing remains an underlying cause for such developments. As Durst (2016: 155) notes, "colonias have historically been treated as a water and wastewater issue, rather than a broader problem of concentrated poverty and the lack of affordable housing." Most housing units in colonia-type communities are self-built in piecemeal fashion because resources available to the property purchasers are extremely limited. The higher prices associated with Model Subdivision lots, which come with access to basic water and sewer-treatment infrastructure, can have the unintended consequence of making them unaffordable to some and possibly result in some lot owners having less money to spend on housing (Olmedo and Ward, 2016).

Policymaking Colonia Definitions

In addition to affordability, a significant policymaking challenge is the definition of colonia. This is to be somewhat expected given that these are informal developments starting in the urban periphery/rural areas with few land use regulations. Land use is not static, so what exists at any one time will change. Nevertheless, it is important to target policy efforts accurately, and this paper explores the concept of Colonias Investment Areas and its usefulness to support DTS efforts to improve liquidity in colonia mortgage lending markets.

Before implementing state model subdivision regulations in the late 1980s and early 1990s, federal, state, and local governments sought to address the problems associated with unregulated and substandard developments and stop creating new ones. State and local governments designated communities as colonias, making them eligible for certain types of federal assistance. In some cases, state governments and federal agencies mapped colonia locations and linked data sources together to better manage assistance efforts (Parcher and Humberson, 2007). This work became the foundation for the resources and identified colonia communities used by this study.

In particular, the Cranston-Gonzalez National Affordable Housing Act of 1990 and its dedication of federal funds for addressing living conditions in colonias spurred activity to better understand where colonia communities were located and their needs. Researchers also credit the debate over the North American Free Trade Agreement (NAFTA) in the early 1990s with putting a national spotlight on colonias and increasing government involvement to improve living conditions in the colonias (Parcher and Humberson, 2007).

Cranston-Gonzalez National Affordable Housing Act Definition

The Cranston-Gonzalez National Affordable Housing Act served as a primary benchmark for defining "colonia" in the United States. Under the Act, a colonia is defined as:

> *any identifiable community that—(A) is in the State of Arizona, California, New Mexico, or Texas; (B) is in the area of the United States within 150 miles of the border between the United States and Mexico, except that the term does not include any standard metropolitan statistical area that has a population exceeding 1,000,000; (C) is designated by the state or county in which it is located as a colonia; (D) is determined to be a colonia on the basis of objective criteria, including lack of potable water supply, lack of adequate sewage systems, and lack of decent, safe, and sanitary housing; and (E) was in existence and generally recognized as a colonia before [November 28, 1990].*[3]

[3] The Cranston-Gonzalez National Affordable Housing Act of 1990, as of March 3, 2021, can be accessed at https://www.govtrack.us/congress/bills/101/s566/text.

The statutory definition targets funding from the U.S. Department of Housing and Urban Development (HUD) and the U.S. Department of Agriculture's (USDA) Rural Development programs to colonias. With this seminal entry into the issue of housing in colonias, the federal law and its language have been used as the underpinning (or replicated) for many definitions and classifications regarding the U.S.-Mexico border and colonia communities in research, policy, and governmental programs and efforts.

The "border colonias region" refers to the area within 150 miles of the border, excluding large metropolitan areas—those with populations of 1 million or more. This geographic distinction is important because research has identified similar types of developments occurring in other areas that would not be considered colonias as defined (Ward and Peters, 2007).

HUD List of Designated Colonias

A key component of the Cranton-Gonzalez Act's definition is the requirement that state governments identify communities as colonias to be eligible to receive certain federal funding. Because the four U.S.-Mexico border states are obligated to use 10 percent of their Community Development Block Grant (CDBG) monies on border colonias, HUD makes publicly available a list of designated colonias for all four states.[4]

There are a few important considerations regarding HUD-designated colonia listings. The state lists may not always precisely capture colonias. For example, the city of Douglas, Arizona, is listed as a colonia in its entirety, but a U.S. Geological Survey effort at mapping colonias in this town identifies specific neighborhoods, not the entire community (Norman et al., 2004) . The state lists, particularly when they refer to unincorporated areas, are not easily identified. For example, one unincorporated California colonia is listed as simply "Subdivision." Because of these issues, additional work would be needed to translate colonia locations into census geographies.

An additional issue is that the federal definition restricts colonias to communities established before November 28, 1990. Similarly, communities created after that date, which are the same areas and in almost all ways identical to HUD recognized colonias (Durst, 2016), are not program-eligible. Although the HUD colonia CDBG set aside is an important federal policy, the exclusion of assistance to developments established after 1990 limits the policy's ability to address the proliferation of colonia-type developments in the region.

Additional Federal Colonia Definitions

Other federal agency definitions retain the substandard living conditions and missing infrastructure requirements; however, the distance to U.S.-Mexico border requirements vary. The Environmental Protection Agency (EPA) definition, for example, considers only communities within 62 miles of the U.S.-Mexico border (USDA/EPA, 2014). The EPA distance to the border reflects NAFTA language from the early 1990s (Smith, 1993). The USDA's Rural Utility Service colonia definition, on the other hand, lacks a distance requirement altogether:

[4] The following HUD link, active as of March 3, 2021, contains a single 2012 list of recognized colonias by state: https://www.hudexchange.info/resource/2388/colonia-list/.

> Any identifiable community designated in writing by the State or county in which it is located; determined to be a colonia on the basis of objective criteria including lack of potable water supply, lack of adequate sewage systems, and lack of decent, safe, and sanitary housing, inadequate roads and drainage; and existed and was generally recognized as a colonia before October 1, 1989. (USDA/EPA, 2014: 1)

These programmatic differences lead to confusion and speak to the need for information to be organized and standardized in a way that aids analysis and program administration. Establishing Colonias Investment Areas or something similar would combine these disparate sources of information into a standardized designation of service areas that could guide policy efforts.

This study operationalizes this approach for identifying Colonias Investment Areas. Next, the analysis describes the housing and mortgage lending characteristics of Colonias Investment Areas, pointing out the areas of need and how the area characteristics fit within what is known about these areas. Finally, the report discusses the benefits and challenges to using such an approach.

Methodology

This research project focused on identifying all census tracts within 150 miles of the U.S.-Mexico border that contain a federal, state, or locally government-recognized colonia community. These colonia-containing census tracts are labeled "Colonias Investment Areas" because they will be the target of future investment efforts. In addition to colonia community location data, this paper uses American Community Survey 2018 5-year estimates and Home Mortgage Disclosure Act (HMDA) mortgage lending data for 2015, 2016, and 2017 to explore Colonias Investment Areas.

Creating Colonias Investment Area Database

The approach to developing Colonias Investment Areas and determining which census tracts contain colonias involves several basic processes.

Identification

The Federal Housing Finance Agency's Final Duty to Serve rule notes that a colonia needs to meet "the definition of a colonia under a federal, state, tribal or local program."[5] Using a similar approach, this research considers only communities that a federal, state, or local government has identified as colonias. Classification as a colonia by a government entity often indicates the community qualifies for a program or resource specifically targeting colonias. The term "recognized colonia" refers to these government-identified colonias.

There is no universal list of recognized colonias. The authors created a separate list for each U.S.-Mexico border state by compiling disparate federal, state, and local government lists of colonias. For example, the Arizona list required consolidating information on recognized colonias from HUD, USDA-EPA, Arizona Department of Housing, Cochise County, Graham County, and Pima County. Exhibit 2 provides a list of the resources this research used to identify colonias. The process of identifying colonias involved collecting and categorizing all unique cases of communities

[5] Published in the *Federal Register* as a final rule on January 1, 2016. 75 Fed. Reg. 55930.

identified by multiple resources, with no preference made for one resource over another. The study identified 2,459 unique colonia records in the four states along the U.S.-Mexico border through this process.[6]

Exhibit 2

Resources Identifying Colonia Communities

Resource	State(s) Covered	Website
Arizona Department of Housing	Arizona	https://housing.az.gov/arizona-designated-colonia
Cochise County (AZ) Development Services Program	Arizona	https://www.cochise.az.gov/development-services/home
Graham County (AZ) Information Technology Department—GIS	Arizona	https://www.graham.az.gov/228/Information-Technology
HUD CDBG Colonia Set Aside Qualifying Communities*	Arizona, California, and New Mexico	https://www.hudexchange.info/programs/cdbg-colonias/
Imperial County (CA) Community and Economic Development Agency	California	http://www.imperialcountyced.com/colonias/
Office of Attorney General of Texas	Texas	https://coloniadata.oag.state.tx.us/
Pima County (AZ) Information Technology Department—GIS	Arizona	http://webcms.pima.gov/government/geographic_information_systems/
University of New Mexico, Bureau of Business & Economic Research	New Mexico	http://bber.unm.edu/colonias
USDA-EPA. 2015. U.S.-Mexico Border Needs Assessment & Support Project: Phase II Assessment Report**	Arizona, California, New Mexico, and Texas	https://www.rcap.org/wp-content/uploads/2016/03/RCAP_Colonias-Phase-II-Assessment-Report_FINAL_web.pdf
USGS CHIPs Project***	Texas	https://pubs.usgs.gov/fs/2008/3079/

CDBG = Community Development Block Grant. GIS = geographical information system. USDA-EPA = U.S. Department of Agriculture-Environmental Protection Agency. USGS CHIPs = U.S. Geological Survey Colonia Health, Infrastructure, and Platting Status.

**Past HUD web pages where each state list of colonias was found are no longer active. This is a general url with program information. An old version of the colonia list can be found here: https://www.hudexchange.info/resource/2388/colonia-list/*

***An additional source that shows the colonia locations plotted is here: https://www.arcgis.com/home/webmap/viewer.html?useExisting=1&layers=a5b2efdea2a844029dbf45e19b014946&layerId=0*

****The original web-mapping portal is not available; this website refers to a document that explains the program.*

Location, Aggregation, and Compilation

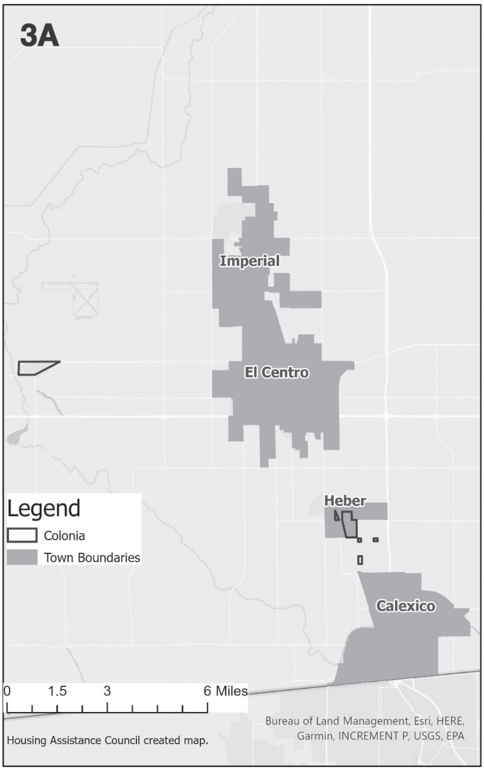
In many cases, the information used to compile the list of recognized colonias also included their geographic location data. Location data frequently came in the form of geographical information system (GIS) shapefiles, which include polygons showing boundaries and points denoting the center point of the polygon. Exhibit 3A and B provides visual examples of the difference between polygon and point formats. See exhibit 4 for a list of location data highlighting where this analysis

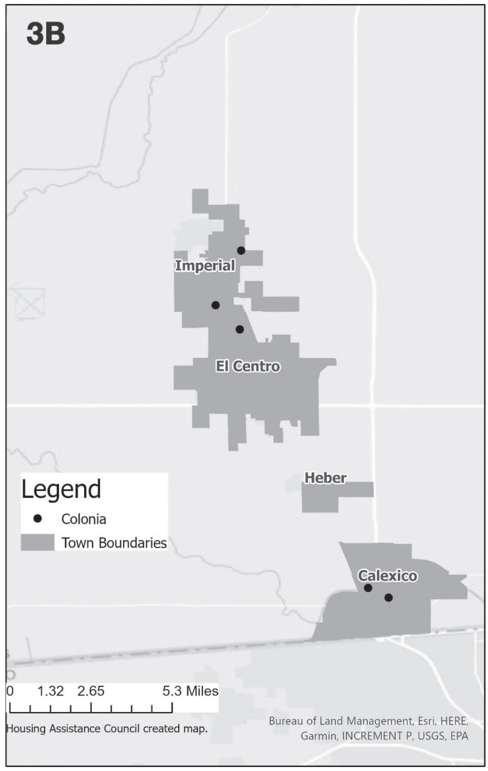
[6] The USDA-EPA 2015 Study information included 50 communities for which the source listed Rural Community Assistance Partnership (RCAP) staff, not a government agency. This meant the case was identified by the people completing the USDA-EPA study but had not been recognized by a government entity. These cases were not included in this analysis. These were the only cases not included.

relied on polygons and/or where it relied on points.[7] The information type varies. Future data improvements will hopefully result in the use of more detailed polygons.

Exhibit 3A and B

A: California Colonias Polygon Format; B: California Colonias Point Format





USGS = United States Geological Survey. EPA = United States Environmental Protection Agency. NPS = The National Park Service

Exhibit 4

Identified Colonias by Method Located

Colonias Location Status and Format	New Mexico*	Arizona	California	Texas
Total Colonias	145	114	34	2,166
Colonias Located	142	100	32	2,166
Colonias Points	24	66	23	0
Colonias Polygons	118	34	9	2,166

**Most of the New Mexico data came from University of New Mexico Bureau of Business & Economic Research work that identified census blocks containing colonias in 2009. See the following url for more information on these projects: https://bber.unm.edu/nm-colonia-maps.*

Source: Authors' calculations based on data from the following: Arizona Department of Housing, Cochise County(AZ) Development Services Program, Graham County(AZ) Information Technology Department-GIS, HUD CDBG Program - Colonia Set Aside Qualifying Communities, Imperial County(CA) Community and Economic Development Agency, Office of Attorney General of Texas, Pima County(AZ) Information Technology-GIS Department, University of New Mexico, Bureau of Business & Economic Research, USDA-EPA. 2015. U.S.-Mexico Border Needs Assessment & Support Project: Phase II Assessment Report, and USGS Chips Project.

[7] The University of New Mexico, Bureau of Business & Economic Research (UNMBBER) already identified the underlying Census blocks for 118 of New Mexico's colonias.

Individual colonia communities were then linked to their census blocks. Census blocks are the lowest level of standard census geography for which the Census Bureau collects and tabulates census information. If 5 percent or more of a census block's land area contained a colonia, it was classified as a colonia census block.[8] If a colonia was represented by a point, the census block containing the point was identified as a colonia census block.[9] A final visual inspection confirmed the results and identified any errors.[10]

Census blocks nest within census tracts, making it possible to aggregate the individual colonia to the census tract level. Aggregating the data produced a count of colonia census blocks for each census tract. Finally, the study classified all census tracts containing at least one colonia census block as "Colonias Investment Areas." Exhibit 5 provides an example highlighting how polygons and points relate to Colonias Investment Areas in Graham County, Arizona.

As a final step in creating the database, the authors compiled and normalized Colonias Investment Areas (census tracts) from each state to provide a consistent database of all Colonias Investment Areas across the four border states.

Geography of Colonias Investment Areas

Using this approach, this analysis identified 446 distinct Colonias Investment Areas representing approximately 6 percent of the U.S.-Mexico border region's census tracts. Exhibit 6 breaks down the distribution of Colonias Investment Areas by state and relative to their share of U.S.-Mexico border region census tracts and population, both in general and for rural areas specifically (using the Federal Housing Finance Agency's [FHFA] DTS rural definition).[11] Although most of the U.S.-Mexico border region population does not live in a Colonias Investment Area, nearly 2.5 million people live in one. Approximately a third of all rural census tracts contain a colonia. Exhibit 7 highlights geographic coverage of the Colonias Investment Areas. Colonias Investment Areas represent census tracts where at least one colonia is located and the entire area does not constitute a specific colonias community.

[8] The 5 percent colonia threshold is to ensure that colonia-census block overlap is real and not the result of digitization errors. Digitization errors are slight inaccuracies that can occur when community boundaries are drawn which could result in an apparent overlap between geographies (colonias and census blocks) when one does not actually exist. The threshold is meant to remove such cases.

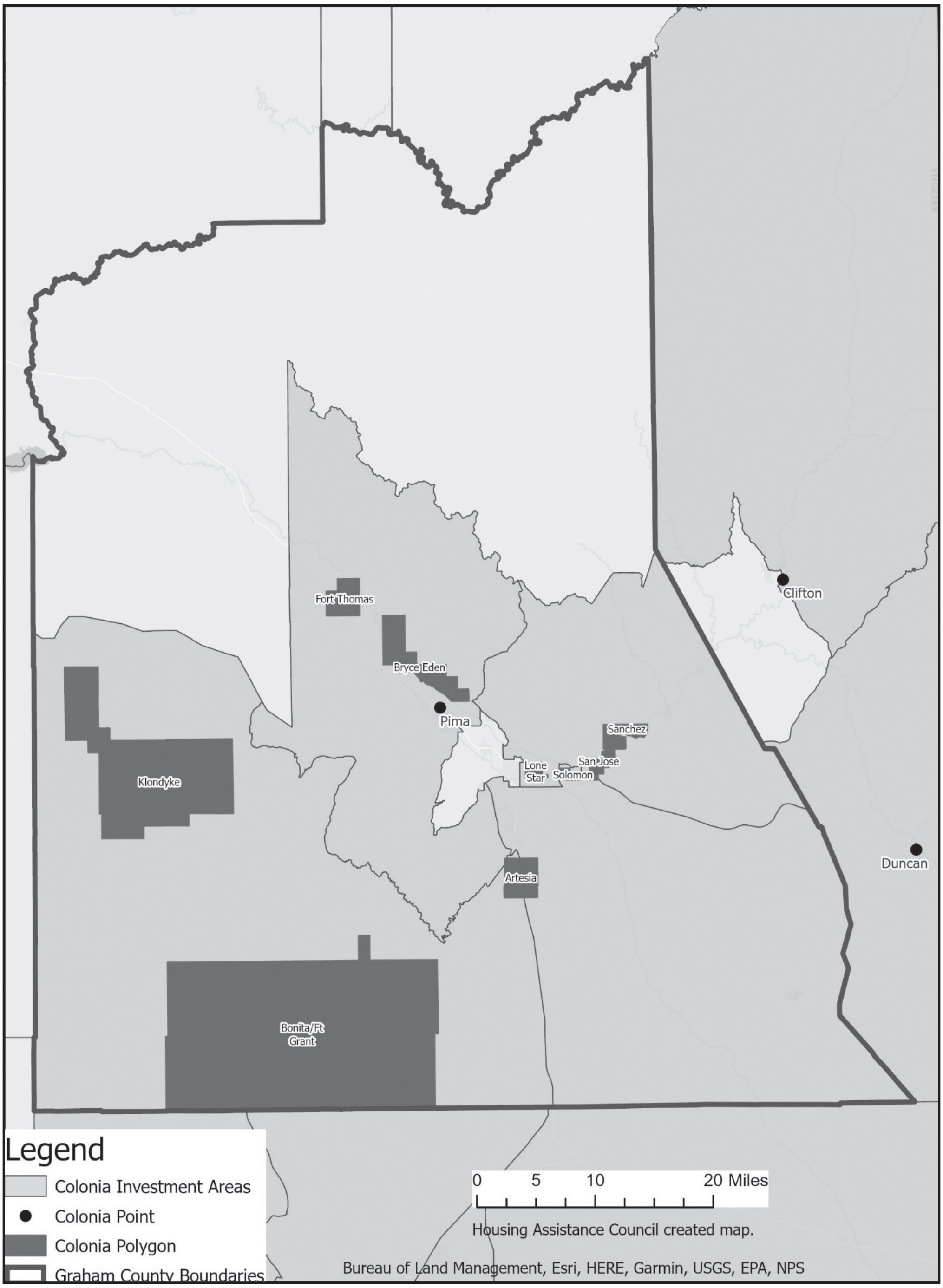
[9] Only the census block containing the colonia point file is classified as such. There is no way to estimate if other census blocks are involved with the colonia.

[10] In general, this study's approach has similarities to the one taken by a 2010 University of New Mexico Bureau of Business and Economic Research (UNMBBER) study, which involved identifying New Mexico census blocks containing colonias. The UNMBBER study used visual inspection of maps/imagery, not threshold or calculation as done here, to identify colonia census blocks. The UNMBBER effort, however, did not go beyond identifying census blocks.

[11] The FHFA DTS rural definition (used 2018 vintage in this report), as of June 21, 2021, can be found at the following url: https://www.fhfa.gov/DataTools/Downloads/Pages/Duty-to-Serve-Data.aspx.

Exhibit 5

Graham County, Arizona Colonias and Colonias Investment Areas



USGS = United States Geological Survey. EPA = United States Environmental Protection Agency. NPS = The National Park Service.

Exhibit 6

Colonias Investment Area Measures

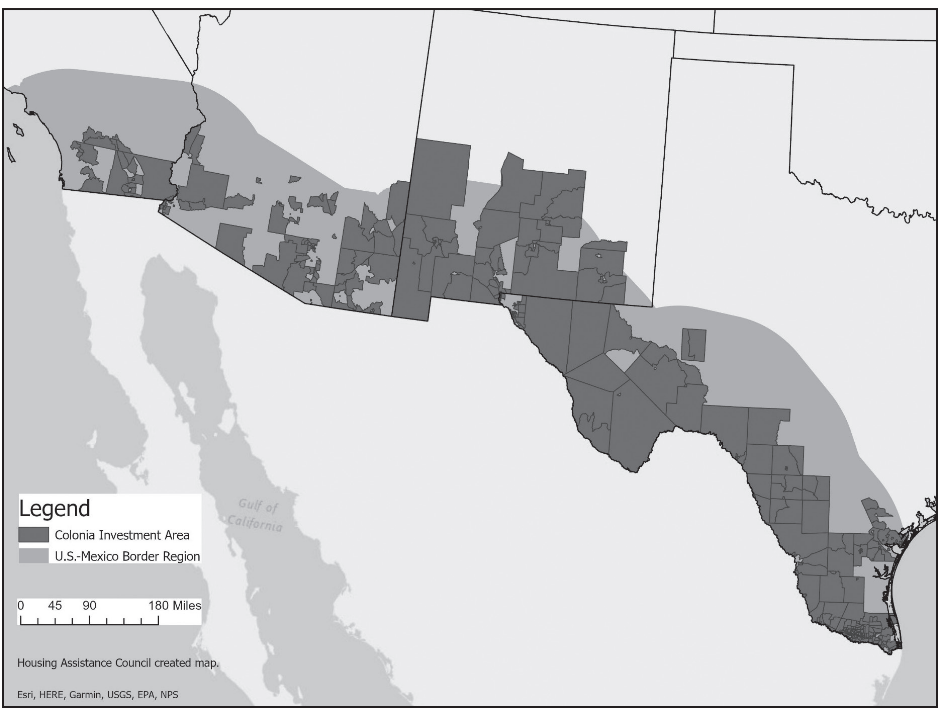
Border States	Census Tracts				Population			
	Total		Rural		Total		Rural	
	U.S.-Mexico Border Region	Colonias Investment Areas	U.S.-Mexico Border Region	Colonias Investment Areas	U.S.-Mexico Border Region	Colonias Investment Areas	U.S.-Mexico Border Region	Colonias Investment Areas
Arizona	1,377	94	138	54	6,052,597	396,551	510,885	201,739
California	4,311	23	125	16	20,574,134	138,750	361,016	82,534
New Mexico	107	58	72	41	471,080	273,249	278,570	166,738
Texas	1,205	271	267	102	6,095,514	1,652,150	1,074,066	453,289
Total	7,000	446	602	213	33,193,325	2,460,700	2,224,537	904,300

Source: Authors' calculations based on data from 2018 American Community Survey 5-year estimates

More than 90 percent of the census tracts in the U.S.-Mexico border region are considered urban, with many in large cities (Los Angeles, Phoenix, and San Diego) and containing no colonias. As exhibit 7 shows, however, most of the region's land area is in Colonias Investment Areas, reflecting the rural nature of many colonias.

Exhibit 7

Colonias Investment Areas



USGS = United States Geological Survey. EPA = United States Environmental Protection Agency. NPS = The National Park Service.

Colonias Investment Areas Most Common in Texas

Texas contains 61 percent of all Colonias Investment Areas. Although 33 counties in Texas have at least one colonia, these communities are largely concentrated in a few areas, notably the lower Rio Grande Valley. For example, Hidalgo County is home to approximately 40 percent of Texas's recognized colonias (over 850) and more than three times the number of colonia communities found in Arizona, California, and New Mexico combined. Exhibit 8 shows the concentration of Texas colonias in counties in two regions—southeast and southwestern parts of the state. This level of concentration, along with the fact that colonias have a relatively small land size in Texas compared with other border states, is reflected in the much higher average number of colonias in Texas Colonias Investment Areas compared with the other border states (1.5,1.4, 2.9, and 8.4 for Arizona, California, New Mexico, and Texas, respectively).

This comparison of numbers of colonias across states is not particularly useful because there is no standardization across states or public entities for identifying colonia communities. For example, colonias in Texas tend to be an identified street or block, whereas, in other states, like California, an entire town might be defined as a colonia. This means a relatively small area in Texas might have multiple colonias, whereas another state might consider the whole area to be a single colonia.

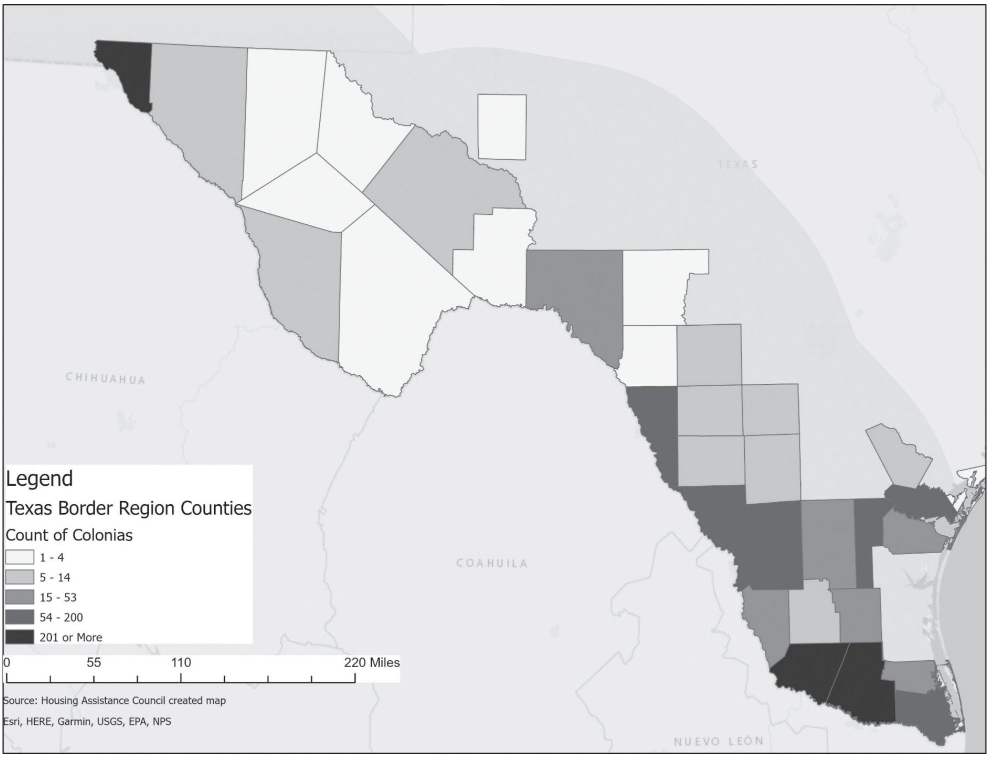
Colonias Are Not Just a Texas Phenomenon

Each of the four border states contains a substantial number of Colonias Investment Areas. Even California, with less than 1 percent of all recognized colonias, is home to 23 Colonias Investment Areas. Despite different demographic and housing characteristics, the relatively broad coverage of these communities indicates that colonias are not just a Texas issue.

Most of the census tracts in the border region of New Mexico are classified as Colonias Investment Areas, reflecting the area's rurality. Two-thirds of the census tracts in the New Mexico border region are rural. New Mexico's border region is unique in that it does not contain a major metropolitan area.

Exhibit 8

Count of Colonias in Texas by Counties



USGS = United States Geological Survey. EPA = United States Environmental Protection Agency. NPS = The National Park Service.

Development Patterns

Colonias are most often associated with rural or exurban fringe areas, where the subdivision and sale of unincorporated land without access to basic infrastructure (roads, water, sewer, etc.) is most likely to occur. Overall, 48 percent of Colonias Investment Areas are classified as "rural" census tracts under FHFA's DTS criteria. The overall rurality patterns vary by state, however. Seventy percent of California and New Mexico's Colonias Investment Areas and 57 percent of Arizona's Colonias Investment Areas are rural.

A review of Texas development patterns explains why less than one-half of all Colonias Investment Areas are rural. The vast majority of Texas colonias communities are in South Texas, which has experienced dramatic urbanization since the 1960s. For example, Hidalgo County's population was 181,535 in 1970 and more than quadrupled to 865,939 by 2018. The original rural/exurban fringe areas where many colonias developments originated are now considered urban. If Hidalgo County Colonias Investment Areas were not included, most of Texas's Colonias Investment Areas (57 percent), as well as a majority of all Colonias Investment Areas (60 percent), would be considered rural. Exhibit 9 shows Colonias Investment Areas by rurality and shows how non-rural colonias are concentrated in a few areas.

Exhibit 9

Colonias Investment Areas by Duty to Serve Rural Classification

USGS = United States Geological Survey. EPA = United States Environmental Protection Agency. NPS = The National Park Service.

Findings

To better understand mortgage finance in Colonias Investment Areas, it is necessary to understand the current state of housing in them. It is also important to see how Colonias Investment Area housing data compare with what other studies find. This helps improve our understanding of the markets. The following analysis describes Colonias Investment Area housing characteristics and mortgage lending activity.

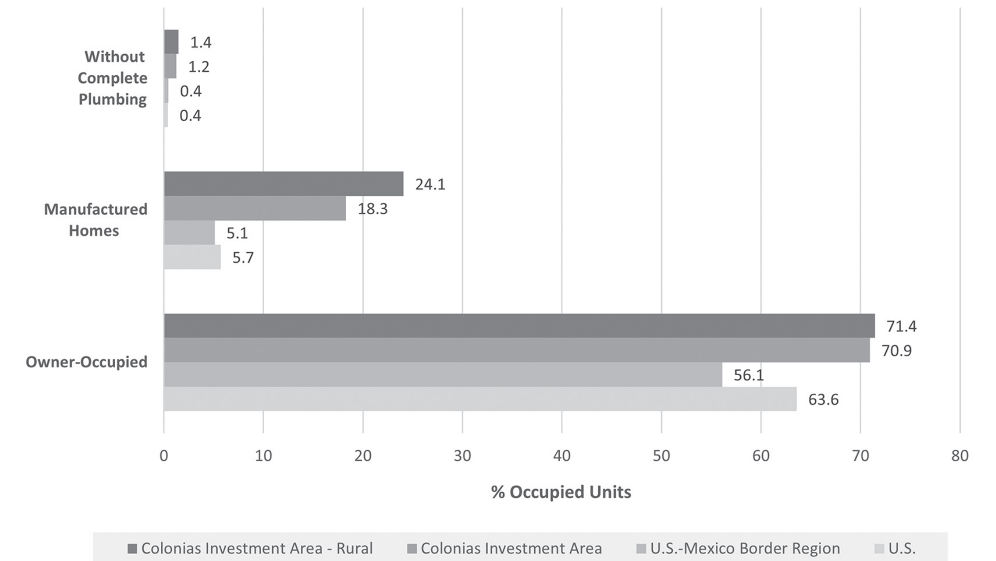
Housing Characteristics

Poor housing conditions play a central role in the recognition and designation of colonias, where the housing stock includes conventional stick-built houses, manufactured homes, and adobe structures. In older colonias, the substandard conditions are largely because of an old, deteriorating housing stock, whereas the newer colonias contain units that were not built to meet code. The development process in colonias primarily involves self-built housing in which lot purchasers build their homes incrementally as funds are available, a process that often starts with an older manufactured home and eventually, over the years, results in a site-built dwelling (Durst and Sullivan, 2019).

Exhibit 10 shows three important housing characteristics comparing conditions in Colonias Investment Areas to those in the United States and U.S.-Mexico border region in general. These characteristics illustrate that Colonias Investment Areas offer homeownership opportunities but often involve substandard housing and manufactured housing. As exhibit 10 indicates, conditions tend to be worse in rural Colonias Investment Areas.

Exhibit 10

Select Housing Characteristics



Source: 2018 American Community Survey 5-year estimates

Homeownership Predominates in Colonias Investment Areas

Households living in Colonias Investment Areas are primarily homeowners. Both in aggregate and at the state level, homeownership rates in Colonias Investment Areas exceed those for the U.S.-Mexico border region. Rural homeownership rates are high throughout the United States, so the elevated rates here suggest disproportionately higher homeownership levels in the suburban/urban parts of Colonias Investment Areas. Although homeownership is generally high in these markets, a portion of these households may have home or land financing elements that charge high fees or include usurious terms and fees.

New Mexico stands out because homeownership rates in its U.S.-Mexico border region are consistently higher in Colonias Investment Areas than in non-Colonias Investment Areas. There may be other factors at work that explain these differences. Such conspicuous findings show that colonias traits vary across the border states.

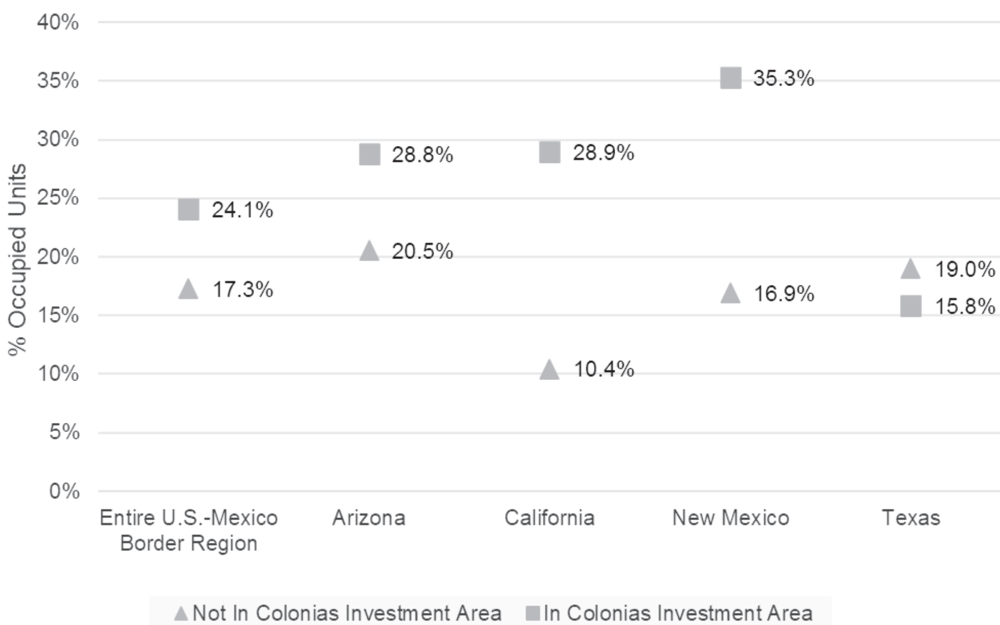
Manufactured Homes Common in Colonias Investment Areas

Manufactured housing is an important housing option in many rural communities and is particularly prevalent in Colonias Investment Areas. In total, as shown in exhibit 10, manufactured homes make up 18 percent of all occupied homes in Colonias Investment Areas compared with 4 percent for all other areas in the U.S.-Mexico border region. In the case of New Mexico, manufactured homes represent 32 percent of all occupied units in Colonias Investment Areas, which is much higher than the 14 percent for the remainder of the New Mexico border region.

The composition of housing structure type is not the same across Colonias Investment Areas in the border states, however. Exhibit 11 shows the share of manufactured housing in the rural portion of the U.S.-Mexico border region by Colonias Investment Area status and state. Rural is highlighted because manufactured housing is most prevalent in that geography. Manufactured homes are more prevalent in Arizona, California, and New Mexico Colonias Investment Areas than in Texas. In California's rural border region, 29 percent of all occupied units in Colonias Investment Areas are manufactured homes, compared with 10 percent for the remainder of the rural area. In Texas's rural border region, 16 percent of all occupied units in Colonias Investment Areas are manufactured homes compared with 19 percent in the remainder of the area. Research notes that such differences exist in colonias, with manufactured housing being more prevalent in certain states like California (Mukhija and Monkkonen, 2006). The Texas differences may also be reflecting that its Colonias Investment Areas contain somewhat older developments where most of the self-built housing has moved from manufactured housing to the site-built unit phase of construction. New Mexico (along with South Carolina) has the nation's highest percentage of manufactured homes in its occupied housing stock, and its Colonias Investment Areas contain a notable share of them.

Exhibit 11

Rural Border Region Percent Occupied Units Manufactured Homes



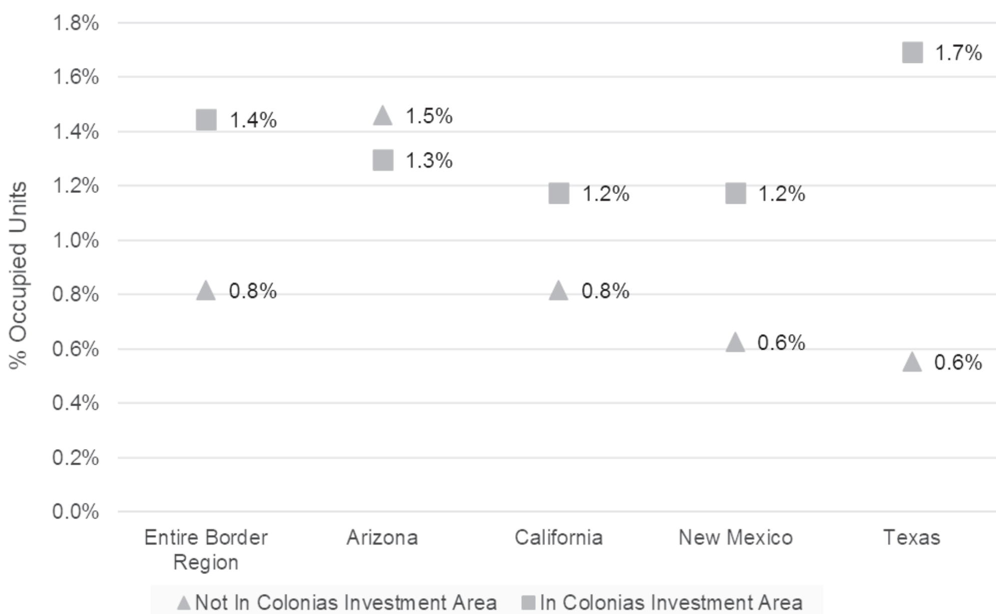
Source: 2018 American Community Survey 5-year estimates

Substandard Housing is a Visible Reminder of Colonias Needs

A defining element of colonia communities is insufficient or missing infrastructure and poor-quality housing. The percentage of units lacking complete plumbing is high for Colonias Investment Areas—1.2 percent compared with 0.4 percent for non-Colonias Investment Areas (see exhibit 10). This refers to an estimated 9,160 occupied units lacking complete plumbing. As shown in exhibit 12, these differences are relatively consistent for all four border states. The rate of homes lacking complete plumbing in Colonias Investment Areas is more than twice the national rate. Although the expansion of water and sewer treatment infrastructure in recognized colonias and new Model Subdivisions has increased access to important infrastructure, the continued poor housing quality and lack of other important infrastructure noted in previous research (Durst and Ward, 2015) means that even this elevated level of incomplete plumbing is a significant undercount of substandard housing.

Exhibit 12

Rural Border Region Occupied Units Lacking Complete Plumbing



Source: 2018 American Community Survey 5-year estimates

Mortgage Lending

The willingness of many border residents to use informal or non-conventional financing mechanisms to obtain homeownership is an indication of the gap in traditional financing available to low-income and immigrant populations. In some cases, this may be due to a dearth of financial institutions in remote rural areas. In others, institutions are present but uninterested or unwilling to lend to these populations.

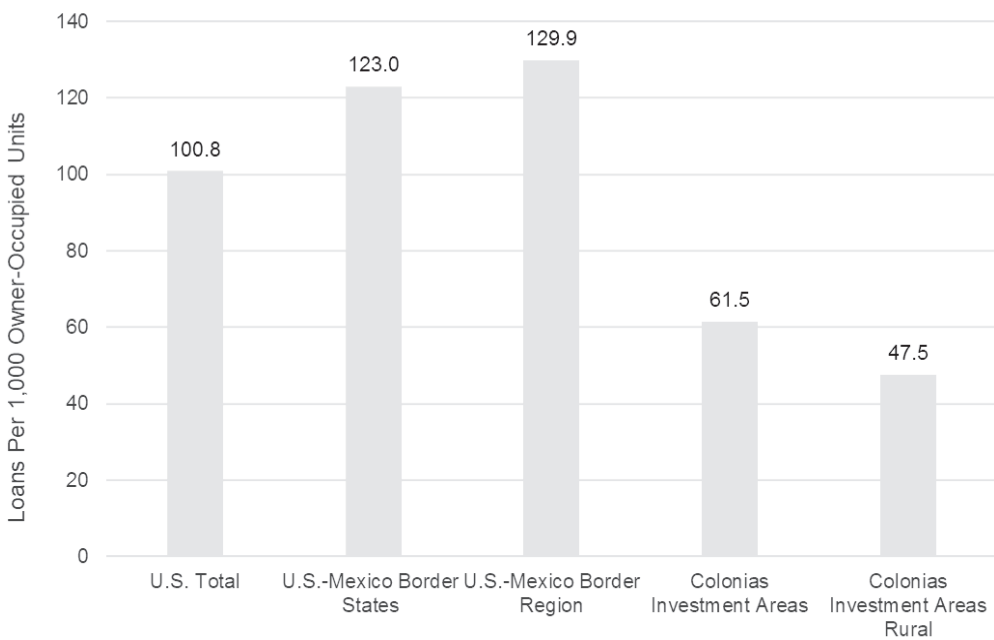
Dearth of Colonia Mortgage Lending Activity

Colonias Investment Areas have substantially lower rates of mortgage lending than nearly any other market nationally. To make lending comparisons, this analysis explores lending activity as the number of loan originations per thousand owner-occupied homes. The originations total represents the annual average number of Home Mortgage Disclosure Act (HMDA) reported loans (home purchase, refinance, and home improvement) originated for the 2015 to 2017 period. An average of 3 years of lending activity was used to minimize fluctuations and volatility that may make any single year unrepresentative of general trends.

The analysis of HMDA data finds an extremely low volume of mortgage lending in Colonias Investment Areas. The U.S.-Mexico border region at large has a relatively high volume of lending, but this includes fast growing urban and suburban areas associated with major cities, like San Diego and Phoenix. Analyses indicate the reduction in lending activity is relatively substantial in Colonias Investment Areas and is most pronounced in rural Colonias Investment Areas. As exhibit 13 shows, the amount of lending—using owner-occupied units to standardize the measure—is more than twice as large for the U.S.-Mexico border region than for Colonias Investment Areas and nearly three times as large as in rural Colonias Investment Areas.

Exhibit 13

Ratio Home Loans (Annual Average 2015–2017) to Owner-Occupied Units



Source: 2015, 2016, and 2017 Home Mortgage Disclosure Act data

A closer look at the data reveals that the limited volume of lending in Colonias Investment Areas is noticeable even when looking at just rural communities. Exhibit 14 shows the ratio of home loans to owner-occupied units for each state's rural U.S.-Mexico border region. The data are broken down by Colonias Investment Area status to show the variation in lending activity. In the entire Texas U.S.-Mexico border region, there were 35 loans per thousand owner-occupied units in rural Colonias Investment Areas, compared with 73 loans per thousand for rural areas not in Colonias Investment Areas. This difference exists for all four border region states. The findings reinforce recent research, which indicated there is limited conventional lending activity in colonias (Durst and Ward 2015). HMDA data captures the formal credit markets that colonia residents cannot access. These informal developments rely on self-financing and incremental development that can limit housing costs, but households live in substandard living conditions for long periods (Durst and Cangelosi, 2020).

Exhibit 14

Ratio Home Loans (Annual Average 2015–2017) to Owner-Occupied Units - U.S.-Mexico Border Region Rural

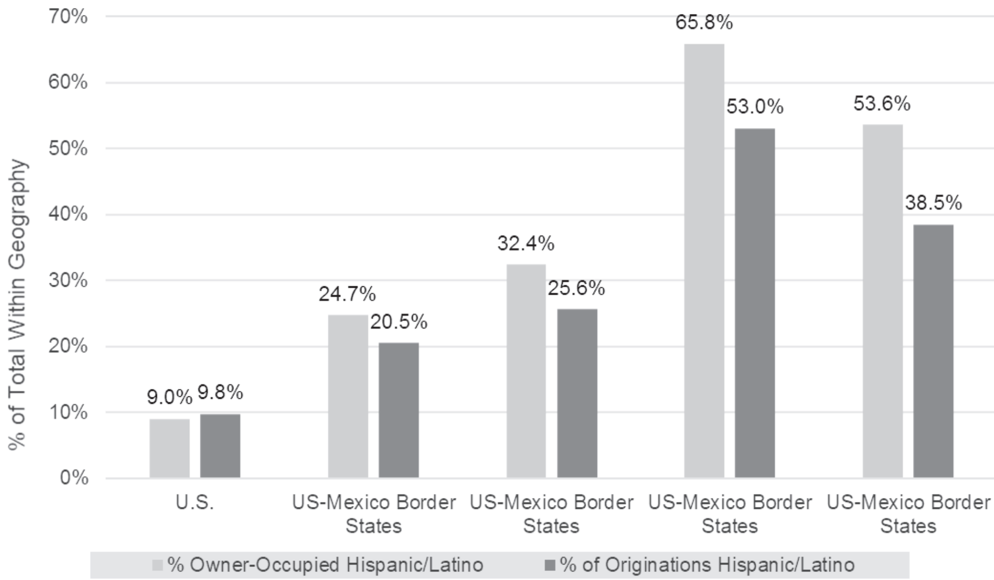
Source: 2015, 2016, and 2017 Home Mortgage Disclosure Act data

Hispanic/Latinx Lending Disproportionately Low

Hispanics/Latinxs make up a large share of the population in many colonias, particularly in Texas. As such, they are an important part of the mortgage lending market. Research indicates Hispanics/Latinxs, along with other minority groups, are generally less likely to receive home loans than white non-Hispanics (Niedt and Silver, 2014). As shown in exhibit 15, Hispanic/Latinx borrowers in Colonias Investment Areas receive a disproportionately low share of loans when compared with their share of owner-occupied units. Hispanic/Latinx households own 66 percent of the owner-occupied housing stock in Colonias Investment Areas. However, from 2015 to 2017, they received only 53 percent of home loans annually. The difference between the share of occupied housing stock and share of home loans increases incrementally from the nation to the border region at large and then again to Colonias Investment Areas.

Exhibit 15

Hispanic/Latinx Share of Owner-Occupied Housing Units and Total Home Lending (2015–2017 Annual Average)



Source: 2015, 2016, and 2017 Home Mortgage Disclosure Act data

Exhibit 16 depicts the ratio of loans to owner-occupied homes for Hispanics/Latinxs in the rural portion of the U.S.-Mexico border region. These data again show much lower Colonias Investment Areas activity. This finding supports Colonias Investment Areas as accurately identifying colonia communities. The ratios for Hispanics/Latinxs are lower than the ratios for all activity in Colonias Investment Areas as a whole and indicate that these homeowners are not receiving an appropriate share of home financing.

Exhibit 16

Ratio Hispanic/Latinx Home Loans (Annual Average 2015–2017) to Owner-Occupied Units - U.S.-Mexico Border Region Rural

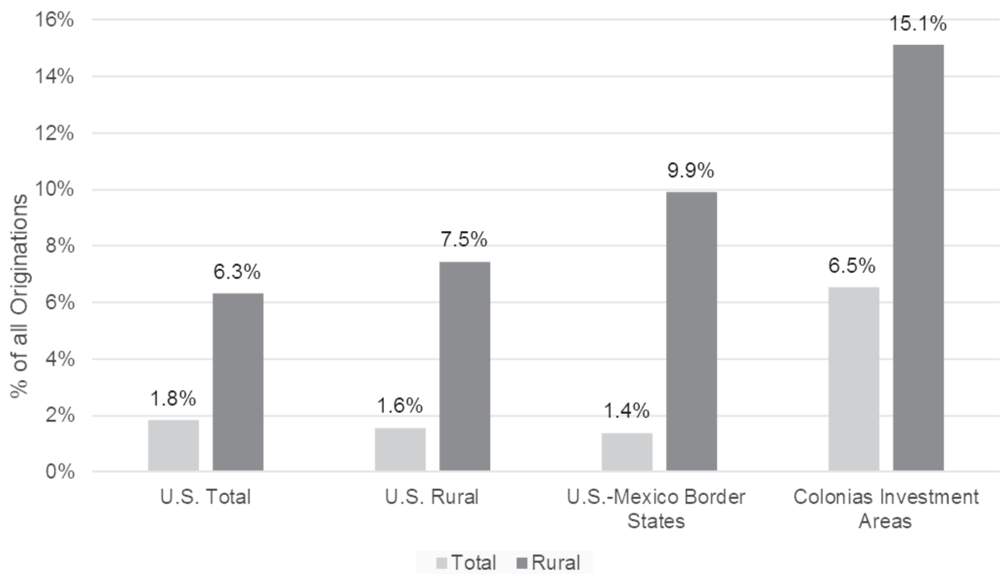
Source: 2015, 2016, and 2017 Home Mortgage Disclosure Act data

Manufactured Home Lending

Manufactured homes are an important component of housing markets in both the border region as a whole and Colonias Investment Areas. A review of HMDA data finds that loans involving manufactured homes represent a relatively large share of lending in rural areas in general and are even more prevalent in Colonias Investment Areas. As shown in exhibit 17, approximately 15 percent of all originations in rural Colonias Investment Areas involved manufactured homes, which is more than twice the percentage for rural areas in general (6.3 percent). Loans involving manufactured homes made up a larger share of lending in Colonias Investment Areas than they did for the U.S.-Mexico border region.

Exhibit 17

Share of Originated Loans Involving a Manufactured Home (2015-2017 Annual Average)



Source: 2015, 2016, and 2017 Home Mortgage Disclosure Act data

The share of mortgage loans that involved manufactured homes is a direct reflection of the prevalence of this housing in Colonias Investment Areas. Although HMDA data do not specify the age of the housing unit, in many cases residents purchase older manufactured homes due to their affordability. It is also important to note that many of these homes might be purchased without a mortgage loan and therefore not captured in HMDA data, so this is likely an undercount of manufactured home sales.

High-Cost Lending

"High-cost loans" signal mortgage loans where the interest rate charged exceeds the interest rate that would be charged on a similar loan to a highly qualified borrower. When the difference meets a certain threshold (1.5 percentage points for first lien loans), the loan is classified as high-cost.[12] High-cost lending is particularly prevalent in the manufactured housing marketplace because these homes can be purchased with personal property loans, commonly referred to as chattel loans, which carry higher interest rates than standard mortgages. High-cost loans are more common in Colonias Investment Areas than in the nation as a whole and the U.S.-Mexico border region.

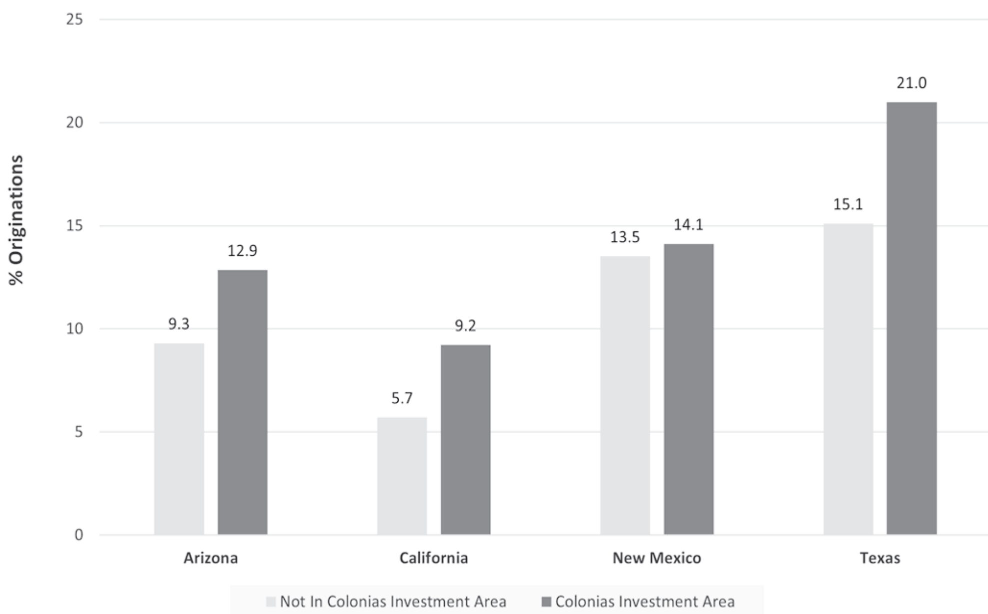
Exhibit 18 shows that for each border state, high-cost lending was more common in rural Colonias Investment Areas than in rural non-Colonias Investment Areas. Texas had the biggest differences in high-cost lending when comparing activity in and out of rural Colonias Investment Areas, but the

[12] As of October 15, 2019, the Consumer Financial Protection Bureau website provides a description on high-cost loans and the thresholds for determining when a loan becomes high-cost: https://www.consumerfinance.gov/ask-cfpb/what-is-a-higher-priced-mortgage-loan-en-1797/.

overall share of manufactured home loans was small. This again indicates that high-cost lending is not only an issue with manufactured homes. Also important is that many other households lack the capabilities to improve their housing conditions through conventional financing because many self-built units are self-financed.

Exhibit 18

High-Cost Loans (2015–2017 Annual Average) Rural U.S.-Mexico Border Region



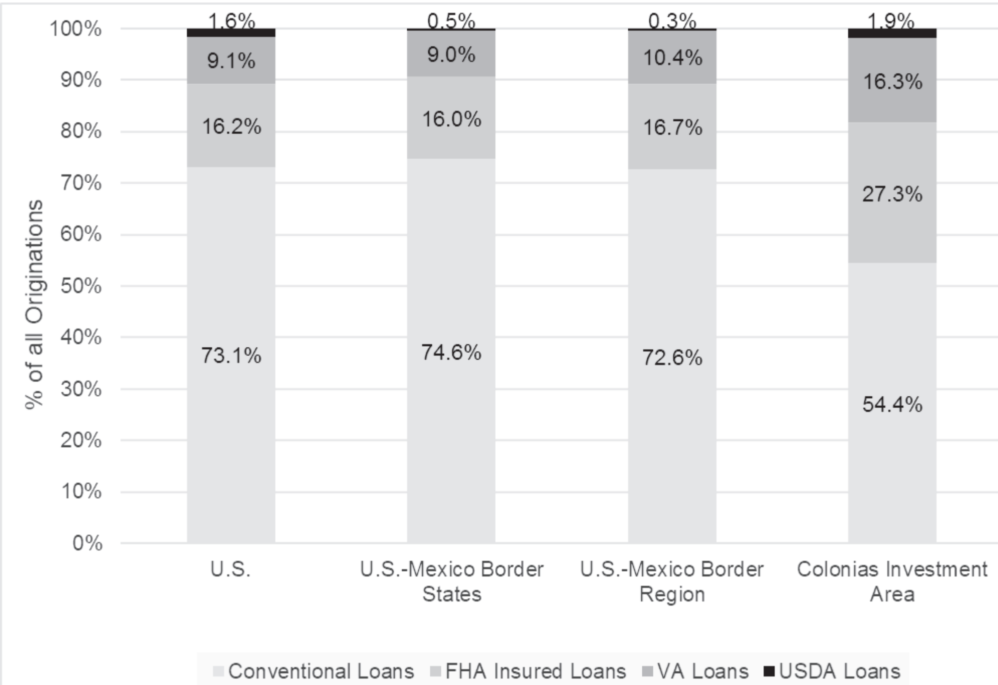
HMDA = Home Mortgage Disclosure Act.
Source: Home Mortgage Disclosure Act data 2015, 2016, and 2017

Loan Types

As shown in exhibit 19, Colonias Investment Areas receive fewer conventional loans and rely more on government-backed mortgage resources. About three-fourths of originations were conventional for the United States or for the border region, but only slightly more than 50 percent were conventional for Colonias Investment Areas. The difference was made up by higher shares of loans insured or guaranteed by the Federal Housing Administration (FHA), Department of Veterans Affairs (VA), or U.S. Department of Agriculture (USDA).

Exhibit 19

Originations 2015–2017 by Loan Type



FHA = Federal Housing Administration. VA = U.S. Department of Veterans Affairs. USDA = U.S. Department of Agriculture.
Source: 2015, 2016, and 2017 Home Mortgage Disclosure Act data

However, the larger share of government-backed lending reflects the shortage of conventional lending activity, not a higher rate of government-backed lending, particularly in rural Colonias Investment Areas. As presented in exhibit 20, the ratios of loans to owner-occupied units, by loan type, shows that the volume of conventional lending in Colonias Investment Areas is about half the volume in the U.S.-Mexico border region, whereas they have about the same level of FHA lending. A further comparison of loans to owner-occupied units for rural and non-rural Colonias Investment Areas highlights the dearth of activity in rural areas.

Exhibit 20

Ratio of Annual Average Loans to Owner-Occupied Units in Thousands, 2015–2017

Loan Type	United States	U.S.-Mexico Border Region	Colonias Investment Area	Colonias Investment Area Not Rural	Colonias Investment Area Rural
Conventional	73.7	94.3	33.5	37.3	27.7
FHA	16.3	21.7	16.8	21.0	10.4
VA	9.2	13.5	10.0	11.4	7.9
USDA	1.6	0.4	1.2	1.0	1.5
Total	100.8	129.9	61.5	70.7	47.5

FHA = Federal Housing Administration. VA = U.S. Department of Veterans Affairs. USDA = U.S. Department of Agriculture.
Source: 2015, 2016 and 2017 Home Mortgage Disclosure Act

Discussion & Policy Implications/Considerations

Review of Colonias Investment Area Findings

The border colonias region is often considered part of "Forgotten America," where struggling communities and their residents are far from the view of the mainstream economy and policy structures. But this region is home to more than 2.5 million people in communities across 250,000 square miles near the southern border. These communities and their residents need and are worthy of investment.

This research undertook a multiple-part process to identify 446 Colonias Investment Areas in the states of Texas, New Mexico, Arizona, and California. Although no geographic definition is perfect, the Colonias Investment Area concept is an advancement in the understudied realm of the border colonias region. Some specific advantages of this Colonias Investment Area typology include using census tracts as a base geography. More granular and precise than counties, tracts are also richer in content and standardization than smaller or less defined units of geography. Colonias Investment Areas represent a pragmatic middle ground between the decades-old expansive definitions that may dilute needs and resource allocation and the small, undefinable settlements without consistent or meaningful parameters.

At the same time, Colonias Investment Areas include recognized colonias and much of the surrounding areas where many of the new colonia-type developments occur. That approach may prove to be too expansive in some cases, leading to the inclusion of other communities that do not need assistance, but in other cases the opposite may be true. This study's review of housing and mortgage lending data suggests these types of problems should be limited; the findings indicate overwhelmingly that Colonias Investment Areas experience some of the most significant mortgage finance challenges and needs in the region and the nation, and are therefore appropriately targeted as indicators of an underserved market. Nevertheless, a regular review of the approach's effectiveness should be undertaken to identify such issues when they arise.

Policy Considerations

This paper's findings point to policy changes that could further improve the usefulness of the Colonias Investment Area concept for targeting efforts to increase liquidity in colonia housing finance markets, such as Fannie Mae's Duty to Serve (DTS) activities.

Revise Colonia Definition

First, an updated and standardized definition of colonia should be adopted and incorporated into the determination of Colonias Investment Areas. The Cranston-Gonzalez Act's colonia definition, which is used to target assistance from HUD's Community Development Block Grant (CDBG) program and the USDA's Rural Development programs, recognizes colonias only if they existed before the statute was enacted in November 1990. This restriction means that thousands of homes in places that meet all the other criteria of the colonias definition cannot receive assistance.

At least two other federal agencies—USDA's Rural Utilities Service and the Environmental Protection Agency—use other, slightly different definitions of colonias. Incorporated into the various federal definitions is the requirement for a state or county to designate a place as a colonia, and there are no uniform rules for doing so. Nor is any consistent type of identifying information provided by states and counties to show precise geographic locations. As a result of these variations, a census tract that might be part of a Colonias Investment Area in one state would not qualify if located in a different state.

There is considerable academic work on informal housing development that could guide efforts to update the definition (Ward and Peters, 2007). The colonias identified under a revised definition should be assessed regularly so that the information remains timely. This would ensure that new colonias are included, and older ones are redefined if warranted.

Identify Colonia-like Communities Elsewhere in the United States

Informal housing developments such as colonias are not solely a U.S.-Mexico border region phenomenon. As research has shown (Ward and Peters, 2007), they occur beyond the 150-mile border limit and in other parts of the country. An approach similar to that applied to identifying Colonias Investment Areas could be a useful way to identify these places with serious housing and infrastructure needs. That information, in turn, could be used to organize resources and focus policies.

Questions for Future Research and Policy Making

Identifying Colonias Investment Areas is only one of many steps needed to address housing and mortgage financing needs in the border region. Policy decisions will be required regarding the best ways to make mortgage lending available and accessible in an area with high poverty rates, high homeownership rates, and extreme needs. Research exists to support some of these decisions, but new analyses will be needed for others.

Coordinate Assistance

Although Colonias Investment Areas were developed for use by Fannie Mae, other entities can use them for targeting other housing improvement efforts, economic development, and more. Accessing a mortgage loan to pay for upgrading the plumbing in a home does not help the homeowner if there is no water and sewer connection available. To what degree are various activities being coordinated currently? What changes might help improve coordination?

Address Income Barriers

Income levels are a key factor in accessing mortgage financing. How are income levels distributed among Colonias Investment Area residents? What are the levels of need for standard financing, minimal assistance, intermediate aid, and deep subsidies? What steps can be taken to make the necessary aid available? What proportion of residents would qualify for what types of assistance under current law?

Provide Education

Some residents of Colonias Investment Areas may be able to afford standard or near-standard mortgage loan products. Lenders, regulators of lenders, secondary market entities, nonprofits, government agencies at all levels, employers, and others can play roles in bringing them into the formal banking market. What changes should be made by which parties to make the institutions and their products accessible? What education should be provided to residents, who should provide it, and who should pay for it?

Create Mortgage Financing Flexibility

For residents who cannot afford standard or near-standard financing, what flexibilities can the mortgage system provide related to credit histories, down-payment levels, and the like? What adjustments are needed to make mortgages available for both new homebuyers and current owners? How much flexibility should be expected or required from institutions that must meet obligations to shareholders as well as communities, customers, and statutory requirements?

Refine State and Local Laws

Texas's Model Subdivision code is an example of a state law that attempts to prevent the development of new colonias-like communities. How successful has it been? What changes might be useful?

What other changes in state and local laws could help make it easier for colonia residents to access mortgage financing? Are there ways to address difficulties in replacing contracts for deed, such as clarifying land title issues?

Are changes in the enforcement of current state and local laws needed?

Consider Non-traditional Approaches

It seems likely that non-traditional approaches can play an important role for at least some colonia residents. Small dollar "microlending" efforts could help homeowners improve or upgrade their housing without having to save first. Giusti and Estevez's 2011 case study of microlending by the nonprofit Nuestra Casa in Starr County, Texas, explores how this program made over 1,000 successful home improvement loans of $2,500 or less to colonia households from 2000 to 2011. The loan product had clear terms, offering 2-year loans at 9 percent interest, and allowed for an expanded loan if all payments were made on time for the first year. These loans were used to make important improvements such as upgrading air conditioning, enhancing flooring, and improving roofs. Due to their small dollar amounts and monthly payments, the loans were affordable, and delinquency rates were low.

Assisted self-help construction or renovation of homes has proven useful as well. The USDA's Section 523 Mutual Self-Help Housing program allocated $31 million in technical assistance for 2020[13] to nonprofit organizations. As noted by Dorsey (2021), the nonprofits then assist participant families who are required to provide a certain proportion of the labor involved in constructing or renovating their homes. Many self-help participants obtain very low interest rate USDA Section 502 direct mortgages, and others qualify for Section 502 guaranteed mortgages or others made by commercial lenders.

Several groups already operate mutual self-help programs serving parts of the U.S.-Mexico border region. For example, FUTURO Communities, Inc. operates a USDA self-help program in Uvalde County, Texas, a county that contains multiple Colonias Investment Areas (Placenia and Cargo, 2017). Some self-help programs provide additional benefits by promoting creative ways to both lower construction costs and reduce environmental impacts. These extra benefits, along with the skills that families can obtain from working on their homes, make such projects promising in both the short and long terms.

Additional support for self-help housing programs is available from a variety of sources, including the only other federal program dedicated to self-help: HUD's Self-Help Homeownership Opportunity Program (SHOP), which covers costs of developing sites where new self-help homes will be constructed. In 2020, SHOP awarded $10 million in grants[14] to intermediary lenders that make the funds available to local self-help sponsoring organizations.

Conclusion

To help inform strategies and policies that could extend greater mortgage investment to the colonias border region, this research project developed the concept of "Colonias Investment Areas." The goal of the project was to develop a comprehensive, usable, and uniform definition of colonias to help target mortgage and finance resources and more efficiently direct assistance to these often overlooked, long-struggling communities. A clearly delineated definition of colonias communities

[13] The following USDA Rural Development (RD) document lists USDA allocations by program including self-help housing technical assistance funds: https://www.rd.usda.gov/sites/default/files/USDARDAppTableFY21.pdf.

[14] The following HUD url lists 2020 Shop Grantees: https://www.hudexchange.info/programs/shop/.

can help policy efforts to bring resources to the colonia. Although there are many challenges to improving mortgage finance in the colonia region, possibilities exist, ranging from improving education to promoting self-help programs.

As the nation begins to recover from the COVID-19 pandemic, it will be more important than ever to ensure resources get to those who most need them. The U.S.-Mexico border region was among the hardest hit in terms of infections (Fernandez, Smith, and Dobbins, 2020; Sieff, 2020). An improvement in home financing that helps reduce substandard housing can help lead the region back from these challenging times.

Acknowledgments

This article was influenced by a multi-year and multi-faceted research endeavor to better understand and better inform a comprehensive understanding and definition of colonias specifically related to the provision of home mortgage finance in the border colonia region. The research project was a partnership between the Housing Assistance Council (HAC) and Fannie Mae. HAC appreciates the support and assistance from Fannie Mae for this work. Additionally, Kelly Cooney and Leslie Strauss from the Housing Assistance Council provided editorial assistance and reviews of the manuscript. Finally, and most importantly, HAC's work on this issue was vastly informed and improved by scores of stakeholders and community representatives and experts from the four border colonias states in Texas, New Mexico, Arizona, and California. There are far too many people to thank individually, but the researchers greatly appreciate their assistance, time, and knowledge in this endeavor. They are the real experts on this subject.

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References

Donelson, Angela, and Esperanza Holguin. 2001. *Homestead Subdivision/Colonias and Land Market Dynamics in Arizona and New Mexico*. Memoria of a Research Workshop: "Irregular Settlement and Self-Help Housing in the United States." Cambridge, Mass. Lincoln Institute of Land Policy. 39–41.

Dorsey, Bryan. 2021. "Refocusing on Sustainability: Promoting Straw Bale Buildings for Government-Assisted, Self Help Housing Programs in Utah and Abroad," *Sustainability* 13 (5): 2545.

Durst, Noah J., 2016. "The Nature and Extent of Self-Help Housing in Texas: From Colonias to Model Subdivisions," *Journal of Planning Education* 36 (2): 145–157.

Durst, Noah J. and Elena J. Cangelosi. 2020. "Self-Help Housing and DIY Home Improvements: Evidence from the American Housing Survey." *Housing Studies*. DOI: 10.1080/02673037.2020.1759514.

Durst, Noah J., and Esther Sullivan. 2019. "The Contribution of Manufactured Housing to Affordable Housing in the United States: Assessing Variation Among Manufactured Housing Tenures and Community Types," *Housing Policy Debate* 29 (6): 880–898.

Durst, Noah J., and Peter Ward. 2015. "Colonia Housing Conditions in Model Subdivisions: A Déjà Vu for Policy Makers," *Housing Policy Debate* 26 (2): 316–333.

———. 2015. "Las Colonias in the 21st Century: Progress Along the Texas-Mexico Border." https://www.dallasfed.org/~/media/documents/cd/pubs/lascolonias.pdf.

Federal Reserve Bank of Dallas. 1996. "Texas Colonias: A Thumbnail Sketch of the Conditions, Issues, Challenges and Opportunities." https://www.dallasfed.org/~/media/documents/cd/pubs/colonias.pdf

Fernandez, Manny, Mitch Smith, and James Dobbins. 2020. "South Texas Communities Have the Country's Highest New Infection Rates," *New York Times*, August 3.

Giusti, Cecilia, and Luis Estevez. 2011. "Microlending For Housing in the United States. A Case Study in Colonias in Texas," *Habitat International* 35 (2): 307–315.

Mukhija, Vinit, and Paavo Monkkonen. 2006. "Federal Colonias Policy in California: Too Broad and Too Narrow," *Housing Policy Debate* 17 (4): 755–780.

Niedt, Christopher, and Marc Silver. 2014. *An Uneven Road to Recovery: Place, Race and Mortgage Lending on Long Island*. Hempstead, NY: Hofstra University, National Center for Suburban Studies. https://www.hofstra.edu/pdf/academics/css/ncss-report-uneven-road.pdf.

Norman, Laura M., Angela J. Donelson, Edwin L. Pfiefer, Alven H. Lam, and Kenneth J. Osborn. 2004. *Monitoring Colonias Development along the United States-Mexico Border: A Process Application using GIS and Remote Sensing in Douglas, Arizona, and Agua Prieta, Sonora*, United State Geological Survey Open File Report 2004-1212. https://pubs.er.usgs.gov/publication/ofr20041212.

Núñez-Mchiri, Guillermina. 2009. "The Political Ecology of the Colonias on the U.S.-Mexico Border: Human-Environmental Challenges and Community Responses in Southern New Mexico," *Southern Rural Sociology* 24 (1): 70.

Olmedo, Carlos, and Peter Ward. 2016. "Model Subdivisions: The New Face of Developer Lot Sales for Low-Income Colonia-Type Housing in Texas," *Land Use Policy* 52: 181–194.

Parcher, Jean, and Delbert Humberson. 2007. *CHIPS: A New Way to Monitor Colonias Along the United States-Mexico Border.* U.S. Geological Survey Open File Report 2007–1230. http://pubs.usgs.gov/of/2007/1230/pdf/OFR2007-1230.pdf.

Placencia, Ana, and Gayle Cargo. 2017. "USDA Self-Help Housing Puts Families in Homes in South Texas," *USDA blog*, March 7. https://www.usda.gov/media/blog/2010/07/01/usda-self-help-housing-puts-families-homes-south-texas.

Sieff, Kevin. 2020. "Coronavirus On the Border," *The Washington Post*, May 27.

Smith, Wesley R. 1993. *The NAFTA Debate Part 1: A Primer on Labor, Environmental, and Legal Issues*. Washington, D.C.: The Heritage Foundation. http://thf_media.s3.amazonaws.com/1993/pdf/bg936.pdf.

U.S. Department of Agriculture and the Environmental Protection Agency (USDA/EPA). 2014. *U.S. Mexico Border Needs Assessment and Support Project: Phase 1 Scoping Assessment Report*. USDA/EPA Report. https://www.rd.usda.gov/files/RD_RUS_Phase1ResearchRpt.pdf.

Ward, Peter M., and Paul A. Peters. 2007. "Self-Help Housing and Informal Homesteading in Peri-Urban America; Settlement Identification Using Digital Imagery and GIS," *Habitat International* 31 (2007): 205–218.

Achieving Spatial Equity Through Suburban Homeownership? Neighborhood Attributes of Hispanic Homebuyers

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The views expressed are those of the author and not necessarily those of the Federal Reserve Bank of San Francisco or the Federal Reserve System.

Abstract

This article examines whether Hispanics achieve spatial equity with Whites through homeownership by comparing the neighborhoods of recent Hispanic and White homebuyers using the 2018 Home Mortgage Disclosure Act data coupled with neighborhood information from the Decennial Census and 2014–2018 American Community Survey for the 100 largest metropolitan statistical areas. It measures aggregate differences between the neighborhoods of Hispanic and White homebuyers and uses regression models to test whether these differences hold for demographically and financially similar homebuyers. It also compares urban and suburban neighborhoods to examine whether neighborhood differences are attenuated or exacerbated based on urban/suburban location. It finds that Hispanic buyers are purchasing homes in neighborhoods with fewer White neighbors and more economic disadvantage (as measured through poverty rates, median incomes, and median home values) and with greater racial change and economic decline, even after controlling for demographic, financial, and loan characteristics of the buyer. It also finds that the gaps in neighborhood characteristics between Hispanics and Whites are often just as large in suburbs as in cities, and that smaller suburban gaps are a result of declining conditions in suburbs relative to cities.

Homeownership has been a core component of the "American Dream" since at least the middle of the 20th century, when the government invested in expanding homeownership through policies of the Federal Housing Administration (FHA) and programs supporting servicemembers returning from World War II. Support of homeownership was particularly strong in suburban areas, driven by federal investments in infrastructure (particularly highways) and FHA insurance guidelines that favored suburban developments over those in central cities (Jackson, 1987). These policies, coupled with the real estate industry's encouragement of suburban, single-family homes, resulted in a substantial growth in homeownership in the middle of the 20th century. Homeownership increased from a low of 43.6 percent in 1940 to 55.0 percent in 1950 and to 61.9 percent in 1960 (Devaney, 1994). The national homeownership rate has not dropped below 60 percent since then. Due to trends in construction and lending (fostered by government policy), much of this growth occurred in suburbs.

This suburban expansion of homeownership, however, happened at a time of deep racial[1] exclusion. Moves to the suburbs were part of a broader pattern of White flight from increasingly diverse urban cores. At the local level, exclusive zoning ordinances, racially restrictive covenants, and acts of violence kept racial minorities from accessing the expanding suburbs. These combined with redlining on the part of federal mortgage insurance programs to effectively keep homeownership, and especially suburban homeownership, out of the reach of minority families. At a national level, the majority of the gains in homeownership had occurred before the passage of the Fair Housing Act in 1968, and the institutional structures and inequities established during this time period imparted a lasting legacy.

Policies that aim to extend homeownership to low-income and minority households are coupled with a belief that these policies will not only reduce housing inequity but also reduce broader inequity by providing access to neighborhoods of opportunity. However, the initial exclusionary suburban expansion resulted in enormous wealth gaps between minorities and Whites (Shapiro, Meschede, and Osoro, 2013) and unequal access to the amenities and opportunities of the suburbs, such as good schools, lower crime, and networks with more social and political capital (de Souza Briggs, 2007). Studies comparing homeownership between Black and White owners have continually found differences in the location and characteristics of their neighborhoods (Fischer, 2013; Fischer and Lowe, 2015; Friedman, Gibbons, and Galvan, 2014; Gabriel and Painter, 2008, 2012; Gabriel and Rosenthal, 1989; Reid, 2007).

Far less research has been conducted on the neighborhood outcomes of Hispanics moving into homeownership, particularly suburban homeownership. Hispanics are both a growing share of homeowners and of suburban communities, however. The Hispanic homeownership rate grew from 43.0 percent in 1994 to a peak of 49.7 percent just before the Great Recession, and has rebounded to 50.1 percent in 2020 from its post-recession low (Housing Vacancy Survey, 2020). Concurrently, the share of Hispanics living in suburbs grew by 33 percent (Massey and Tannen, 2018), and in the largest metropolitan areas the majority of Hispanics live in suburbs (Suro and Singer, 2002). Over this same time period, however, suburbs were experiencing a profound shift, with changes in the nature and geography of work coupled with new expansions of poverty in the suburbs. It is unclear what type of neighborhoods these new homeowning or suburban Hispanics

[1] Race and ethnicity are used interchangeably in this article when referring to the exclusion and stratification that Hispanics have faced on account of being Hispanic. Although Hispanic is considered an ethnicity as classified by the U.S. Census Bureau, and many Hispanics racially identify as White on the Census, their exclusion from housing opportunities and neighborhoods is based on being classified or perceived as something other than White, i.e., their experience has been racialized and their exclusion is not dissimilar from that faced by Black people.

are living in and to what extent legacy and contemporary discrimination, redlining, and structural inequality is limiting their access to neighborhoods of opportunity. Literature on the location outcomes of Hispanics suggests that homeownership is correlated with living in more economically prosperous neighborhoods (Alba, Logan, and Stults; 2000; Hyde and Fischer, 2021; Logan et al., 1996; Woldoff, 2008), but less research examines whether homeownership allows Hispanics to live in neighborhoods similar to those of Whites.

This article fills that gap by comparing the neighborhoods of recent Hispanic and White homebuyers across a variety of characteristics, focusing on those that are closely related to segregation, economic opportunity, and the wealth-building potential of homeownership. This article answers four questions:

1. Are Hispanic homebuyers purchasing in neighborhoods comparable to those of similar White buyers?

2. Are Hispanic buyers moving into declining or ascendant neighborhoods relative to similar White buyers?

3. Does suburbanizing improve neighborhood outcomes for Hispanic homeowners relative to urban homeownership?

4. How does buying in the suburbs affect Hispanic-White differences in neighborhood quality relative to buying in the city?

This article uses data from the 2018 Home Mortgage Disclosure Act for the 100 largest metropolitan statistical areas (MSAs), merged with 2000 Decennial Census and 2013–2017 American Community Survey tract data to examine these questions. It evaluates Hispanic-White differences across four neighborhood characteristics, both in 2017 and the change from 2000–2017: the share of the neighborhood that is non-Hispanic White, the share of the neighborhood that is living in poverty, neighborhood median income, and neighborhood median home value.

This study finds that in 2018, Hispanic households bought homes in more economically disadvantaged neighborhoods and with fewer White neighbors, both in aggregate and after accounting for differences between Hispanic and White buyers. Additionally, Hispanics are moving into neighborhoods that have experienced larger demographic change, greater income declines, and more limited price appreciation, regardless of their urban or suburban location. Although these results cannot determine the cause of these differences, they point to lingering inequalities in residential outcomes that affect both current households and long-term outcomes through impacts on wealth-building and access to opportunity.

These results also point to the shifting nature of suburban neighborhoods and whether Hispanic homebuyers are able to access historically exclusive suburban enclaves. This study finds that the suburban neighborhoods of recent homebuyers are often stronger economically and more ethnically integrated than urban ones, with lower levels of poverty, higher median incomes, and more evenly distributed racial populations. However, despite improved economic outcomes in the suburbs, Hispanic homebuyers in suburban areas are not living in neighborhoods comparable to those of their suburban White peers; across several neighborhood characteristics, the differences between the neighborhoods of Hispanic and White homeowners are just as substantial in suburban communities as in urban ones. There are some neighborhood characteristics for which residence in the suburbs helps to narrow (though not eliminate) the difference between Hispanic and White homebuyer neighborhoods; however, rather than a rising tide lifting all boats, Hispanics and White buyers alike are living in suburban neighborhoods with less economic prosperity than urban ones. These data suggest that Hispanics are not necessarily accessing neighborhoods of opportunity in the suburbs, even when living in neighborhoods more similar to their White peers.

Homeownership, Suburbs, and Ethnicity

Homeownership is central to wealth-building for most American families, and housing policy also prioritizes homeownership because it is believed to provide access to various forms of neighborhood opportunity. However, these nonfinancial characteristics are not about homeownership itself but rather that it often takes place in suburban communities. The real estate industry, federal housing policy, and local zoning regulations have contributed to these dynamics, encouraging homeownership in suburban, single-family homes in particular (Jackson, 1987; Vale, 2007; Wright, 1983). Restrictive zoning policy, racial covenants, redlining, and discrimination kept the suburbs and suburban homeownership outside the reach of minority families (Jackson, 1987; Rothstein, 2017; Turner et al., 2002, 2013; Wright, 1983).

As a result of this racially exclusionary pattern of development, suburban neighborhoods were characterized by White, thriving middle- or upper-class communities (Devaney, 1994) and this characterization of suburban neighborhoods remains prevalent today. Scholars use terms like “stereotypical” and “traditional” to describe high-income, White suburbs, cementing notions of what suburbs are expected to look like (Hanlon, Vicino, and Short, 2006; Mikelbank, 2004). Even among inner-ring suburbs, which often have more similarities with the central city or have experienced more racial change, nearly one-third are middle-class, mostly White communities (Hanlon, 2009).

At the same time, the demographics of suburbs have been steadily changing, with large growth in their minority and immigrant populations in the 1990s and 2000s (Hardwick, 2008; Massey and Tannen, 2018; Suro and Singer, 2002; Suro, Wilson, and Singer, 2011). Suburbs went from being 82.1 percent White in 1990 to 68.4 percent White in 2010 (Massey and Tannen, 2018). Recent planning scholarship on the diversity of suburbs, suburban decline, and the suburbanization of poverty has recognized differentiation among suburbs and suggests that suburbs are not all racially homogenous, economically prosperous places (Hanlon, 2009; Hanlon, Vicino, and Short, 2006; Mikelbank, 2004). This greater degree of diversity has increased variety in suburban trajectories. As a whole, suburban neighborhoods are more likely to be stable or have experienced an upward trajectory than their urban counterparts (Airgood-Obrycki, 2019). This general trend disguises variation on the ground. Hanlon, Short, and Vicino conceive of a “suburban gothic” in which the “downward spiral of declining investment and socioeconomic status” of inner ring suburbs is one of its elements (2009: 159), whereas others also document a substantial share of suburbs experiencing decline (Airgood-Obrycki, 2019; Hanlon, 2010). Kneebone and Berube (2013) highlighted the rapid growth of poverty in suburban areas, due to the migration of low-income individuals from cities to suburbs but also due to the declining economic situations of households already living in the suburbs. Other scholars have also documented these trends (Covington, 2015; Howell and Timberlake, 2014; Kneebone and Nadeau, 2015; Murphy and Allard, 2015).

There is a racial and ethnic component to the variations in suburbs and suburban trajectories. Segregation has often limited the expansion of poverty in high-income suburbs because only low-income White households are able to make the transition (Covington, 2015), whereas other suburban areas mainly became available for minority residents as a result of White flight (Diaz, 2005; Mills and Fischer, 2015). Although Hispanic-White segregation is typically lower in suburbs than in central cities, it is still present (Lichter et al., 2010; Lichter, Parisi, and Taquino, 2015; Massey and Tannen, 2018). Furthermore, in metros that have relatively new Hispanic populations, suburban segregation is higher than urban segregation in established Hispanic locations (Lichter, Parisi, and Taquino, 2015). This segregation is entangled with suburban trajectories. Research suggests that suburbs with larger minority populations often have lower home values (Anacker, 2010, 2012; Pooley, 2015) and that home price appreciation is affected by the racial and ethnic composition of the suburb (Anacker, 2010, 2012). These patterns persist partly due to how homes are appraised and the racialized perceptions of neighborhoods held by appraisers (Howell and Korver-Glenn, 2018, 2020). With respect to more generalized suburban trajectories, those with the most extreme decline have larger Black and Hispanic populations (Hanlon, 2010; Hanlon, Short, and Vicino, 2009).

Previous Research on Hispanic Owner Neighborhoods

The historic and contemporary segmentation of housing markets affects the type of neighborhoods Hispanics can access. Relative to White households, Hispanic households have more non-White neighbors and live in areas with lower median incomes (Alba, Logan, and Stults, 2000; Hyde and Fischer, 2021; Pais, South, and Crowder, 2012; Woldoff, 2008). Other research has concluded that Hispanics are more likely to live in neighborhoods with more blight (Friedman, Gibbons, and Galvan, 2014; Friedman and Rosenbaum, 2007). Evidence suggests that although differences in neighborhood characteristics exist among lower- and middle-income Hispanics and Whites, affluent Hispanics are sometimes able to live in neighborhoods similar to those of Whites (Logan et al., 1996; Pais, South, and Crowder, 2012).

Two dominant theories have emerged to explain these differences in neighborhood outcomes in the location attainment literature described previously. The first is residential assimilation. It posits that as Hispanics (or immigrants, or other minorities) socioeconomically assimilate with the dominant group (Whites, in this case), they translate this socioeconomic mobility into spatial mobility, moving away from ethnic neighborhoods into ones that are majority White. Under this theory, increases in income, education, and English skills, for example, result in neighborhood outcomes that are more similar to those of Whites (Alba, Logan, and Stults, 2000; Alba and Logan, 1992; Friedman, Gibbons, and Galvan, 2014; Friedman and Rosenbaum, 2007; Hyde and Fischer, 2021; Pais, South, and Crowder, 2012; Woldoff, 2008). The second theory is place stratification. It asserts that assimilation is not enough to understand the differences between

Hispanic and White residential outcomes. Rather, disparate residential outcomes are the result of not only socioeconomic differences between the two groups but also social structures (including discrimination in housing markets and lending) that inhibit the ability of Hispanics to obtain the same outcomes as Whites with the same socioeconomic status (Friedman, Gibbons, and Galvan, 2014; Friedman and Rosenbaum, 2007; Hyde and Fischer, 2021; Logan and Alba, 1993; Pais, South, and Crowder, 2012; Woldoff, 2008). Under this framework, drivers of location outcomes, such as income, are expected to have different effects across racial or ethnic groups.

Because Whites are predominantly suburban and majority homeowners, suburbanization and homeownership themselves are considered assimilative outcomes in these theoretical frameworks. In fact, Friedman and coauthors have argued that an "implicit assumption of the spatial assimilation model is the notion that assimilation involves a move to the suburbs" (Friedman, Gibbons, and Galvan, 2014: 157). Independent of ethnicity, suburban residents often live in better neighborhoods than their central city counterparts (Alba, Logan, and Stults, 2000; Friedman, Gibbons, and Galvan, 2014; Logan et al., 1996; Pfeiffer, 2016; Woldoff, 2008), and homeowners tend to live in neighborhoods with more Whites, higher incomes, or less blight than renters (Alba, Logan, and Stults, 2000; Alba, and Logan, 1992; Friedman, Gibbons, and Galvan, 2014; Friedman and Rosenbaum, 2007; Logan and Alba, 1993; Woldoff, 2008). As a result, one would expect suburban Hispanic homeowners to live in neighborhoods that are less segregated and are more socioeconomically advantaged than their urban, renter counterparts. However, in the presence of place stratification, homeownership or suburbanization may not reduce the inequity between Hispanics and Whites.

Few studies explicitly consider whether homeownership or living in the suburbs increases residential equity between Hispanics and Whites. Logan et al. (1996) combine tract-level data and public microdata to estimate the median household income and share non-Hispanic White at the tract level for White, Black, Asian, and Hispanic households in five MSAs in 1980. The study found that homeownership is correlated with higher neighborhood incomes and that living in the central city (relative to the suburbs) is correlated with lower median incomes for all racial groups. With respect to neighborhood racial composition, all households living in cities had fewer White neighbors, whereas non-Black homeowners typically lived in neighborhoods with more White residents (Hispanic homeowners were no more likely to live in Whiter neighborhoods than Hispanic renters in Chicago and San Francisco). Alba, Logan, and Stults (2000) extend these results to 1990, with similar findings. Neither study examines the combined effect of homeownership and suburban location. Pfeiffer (2016) evaluates neighborhood conditions at the census tract level in cities and older and newer suburbs. She finds that minorities living in newer suburbs tend to live in neighborhoods more similar to those of Whites, relative to those living in older cities and suburbs; she does not assess how tenure impacts these outcomes. Most similar to this study, Friedman, Gibbons, and Galvan (2014) focus on middle-class and affluent homeowner households in cities and suburbs and observe a variety of indicators of neighborhood problems in addition to housing value. They find persistent neighborhood differences between Hispanic and Black middle-class and affluent owners and White ones, despite looking only at higher-income households, and find that the disparity for Hispanics is more pronounced in the suburbs for all of their variables with the exception of home value.

These studies offer important insights into the differences in homeownership outcomes between Hispanics and Whites across metropolitan geographies, but they also point to lingering gaps in the literature. The only study to observe neighborhood outcomes for homeownership and suburbanization together (Friedman, Gibbons, and Galvan, 2014) stands in contrast to the others by finding greater disadvantage for suburban Hispanics. The current study helps to broaden our understanding of Hispanic homeownership and the relationship between urban and suburban location on neighborhood characteristics. It evaluates neighborhood characteristics more consistently with the broader locational attainment literature—neighborhood racial composition, poverty rates, median incomes, and median home values—while following Friedman, Gibbons, and Galvan (2014) in using microdata and focusing on homeowner households.

This study also contributes to the literature by looking at recent homebuyers, rather than a cross-section of residents, because few studies focus on movers. Analyses of homeowners, regardless of when they moved into the neighborhood, reflect current spatial inequalities, but those inequalities may be a result of neighborhoods that have changed around the residents. By focusing on mover households, this study can observe both the homebuyer and the neighborhood at the time that the location decision is made. Another contribution of this study is that it uses 2018 data. Studies using data from the 2000s and early 2010s captured households during an unusual time in the housing market—first in an unsustainable expansion of credit, fueled by predatory loans, particularly to Hispanic and other minority households, and then through a period of sustained contraction. Buyers in 2018, however, still likely represent a conservative estimate of Hispanic-White differences, as credit remained constrained and only higher-credit-quality borrowers were able to access homeownership in this market. Although this study is not able to address the endogeneity that is present in residential decision-making—such as preferences to live near one's current location, social networks, place of work, or others of the same ethnic group—lingering spatial inequity is important to identify because it has long-term impacts on the economic and physical wellbeing of households, regardless of whether its source is structural discrimination or collective preferences.

Data

This study uses 2018 Home Mortgage Disclosure Act (HMDA) data, merged with the 2013-2017[2] American Community Survey (ACS) and 2000 Census.[3] The 2018 HMDA data provide unique advantages over other sources of homeownership data. First, the data provide information on individual homebuyers at the census tract level. Second, HMDA data include extensive information on the mortgage application in addition to buyer demographics; this facilitates comparisons between buyers, allowing for controls on the loan product and the value of the purchased home (which can reduce unobserved heterogeneity such as assets or credit quality). Finally, capturing buyers from only a single year ensures that the data show housing choices and neighborhood outcomes at the time of purchase. Using 2018 purchases but observing 2013–2017 neighborhood characteristics ensures that the buyers themselves do not influence the neighborhood composition.

[2] Shorthanded to 2017 for the remainder of the article.

[3] Standardized to 2010 geography provided by the Longitudinal Tract Database (Logan, Xu, Stults, n.d.).

The analysis is limited to the 100 largest MSAs in 2017 because these are the ones where differences between the city and its suburbs are most distinct. The sample is further limited to a "typical" home purchase: the loan must be a first-lien, intended for owner-occupancy (and not used for commercial or business purposes), be used for the purchase of a 1–4-unit structure or condominium, and be site built (meaning not manufactured housing). Outliers in terms of borrower income, home value, loan value, loan-to-value ratio, and rate spread were also trimmed to reduce concerns around data errors and to eliminate atypical home purchases.[4] Finally, analysis was restricted to homebuyers with a non-Hispanic White[5] or Hispanic primary borrower.

This article uses change from 2000–2017 to evaluate the long-term trajectory of homebuyer neighborhoods. It captures data from two peak periods: the end of the 1990s economic expansion and the robust recovery after the Great Recession. As a result, these estimates are relatively conservative—if ethnic differences exist in the boom periods, they are often more pronounced during times of economic hardship because minorities and low-income families often fare worse during downturns (Bayer, Ferreira, and Ross, 2016; Faber and Ellen, 2016; Reid, 2014). Recent research suggests that few neighborhoods substantially reverse course relative to their long-term trends (Airgood-Obrycki, 2019).

This article classifies urban and suburban following Kneebone and coauthors (Kneebone and Berube, 2013; Kneebone and Nadeau, 2015); the first city in an MSA name is "urban," and any additional named principal cities with at least 100,000 residents are also urban. Any other areas within an MSA are suburban. The article uses this definition because it is consistent across MSAs, exogenous to homeownership, in line with the literature, and aligned with jurisdictional boundaries.

Methods

In order to evaluate the similarity of neighborhoods, this article analyzes four neighborhood characteristics, each at the census tract level: share non-Hispanic White, share in poverty, median household income, and median home value, along with the change in these attributes from 2000–2017. When studies examine more than one dependent variable, they often find divergent results across different variables, suggesting that processes of residential decision-making and outcomes operate differently along different neighborhood dimensions. For that reason, this study examines neighborhood attributes across four dimensions.

This article uses an ordinary least squares model to compare the neighborhood characteristics of Hispanic and White homebuyers. Some of the literature on neighborhood outcomes for minorities uses hierarchical linear models (HLM) to address the relative concentration of Hispanics in certain MSAs and regions. HLM allows for analysis of MSA-level characteristics and between- versus within-MSA comparisons (see, for example, Pais, South, and Crowder, 2012). HLM requires correctly modeled MSA-level characteristics, however, on which there is no consensus in the literature. As the primary variables of interest, Hispanic or White and urban or suburban are at a level smaller than the MSA; this article instead uses MSA fixed effects to control for metropolitan

[4] 42,790 loans (2.5 percent of eligible sample) were dropped due to outliers.

[5] For the remainder of this article, "White" is used as shorthand for non-Hispanic White. Hispanics may be of any race.

variation. This is a less restrictive assumption than the random effects used in HLM. This article uses MSA-clustered standard errors to address spatial correlation between homebuyers within the same housing market.

The three main variables of interest are whether or not the primary borrower is Hispanic, whether the purchased home is in the suburbs, and an interaction term between Hispanic and suburban, to allow for heterogeneity in the effect of suburbanization by ethnicity. This article also includes and analyzes information on the race/ethnicity[6] of a co-borrower if one exists (no co-borrower is the reference category), because the race/ethnicity of all loan applicants is likely to affect the mortgage-acquisition process (Cortes et al., 2007; Goodman, Zhu, and George, 2015; Li, 2014; Turner et al., 2002), preferences for neighborhood racial/ethnic characteristics (Ellis, Wright, and Parks, 2006), and neighborhood search behavior (Krysan and Bader, 2009; Krysan and Crowder, 2017). The race/ethnicity of the co-borrower is interacted with the ethnicity of the primary borrower in order to capture all possible racial/ethnic pairings.

In addition to these key variables of interest, this article includes other demographic controls (age and sex) and information on the property purchased and loan obtained in order to compare Hispanic and White buyers who are as similar as possible. The buyer's ability to purchase a more expensive home or one in a higher-priced neighborhood is accounted for by using a variety of buyer and loan characteristics: income (logged), property value (logged), loan type (Federal Housing Administration insured, Veterans Affairs guaranteed, U.S Department of Agriculture (USDA) Rural Housing Service or Farm Service Agency guaranteed, and conventional [reference category])[7], loan-to-value ratio, debt-to-income ratio (36-46 percent as the reference category), and rate spread (lowest quartile as the reference category).

Results

This section begins with descriptive statistics and then details aggregate differences between the neighborhoods of Hispanic and White buyers. It then presents regression results on current neighborhood characteristics and changes in neighborhood characteristics since 2000. Finally, it briefly discusses how ethnic affinity may influence the racial composition of the neighborhood.

Descriptive statistics for the independent variables used in the regression are presented in exhibit 1; results are presented separately for Hispanic and White buyers. Hispanics made up 17.4 percent of the purchase loans in the study. Hispanic buyers were typically younger than White buyers and less likely to have a co-borrower. Both Hispanics and Whites typically have a co-borrower of the same ethnicity, but Hispanics are more than two times more likely to have a co-borrower of a

[6] Race and ethnicity are based on the primary race/ethnicity of the co-borrower (race and ethnicity were asked separately). Race/ethnicity categories are mutually exclusive: Hispanics may be of any race, while all other racial groups are non-Hispanic.

[7] The type of loan used to purchase a home is not relevant this study. However, the characteristics of homebuyers may differ systematically by the type of loan used, and the different federal loan programs (FHA, U.S. Department of Veterans Affairs [VA], and USDA) have guidelines around credit scores and other loan qualification criteria that can differ from those of conventional loans (conventional loans are those that are not FHA, VA, or USDA loans). In the absence of complete credit characteristics of the buyers that would allow models to control for these differences across programs, loan types are controlled for to reduce unobserved variable bias.

different ethnicity, and more than one-fifth of Hispanics with a co-borrower have a non-Hispanic co-borrower. Average incomes among Hispanic buyers were lower, as were property values. Finally, Hispanics were less likely to receive a conventional mortgage loan and more than twice as likely to use FHA financing.

Exhibit 1

Descriptive Statistics

	White	Hispanic	Total
White	-	-	82.6%
Hispanic	-	-	17.4%
City	20.9%	26.4%	21.9%
Suburb	79.1%	73.6%	78.1%
Co-borrower (CoB) race/ethnicity			
No co-borrower	53.2%	58.6%	54.2%
CoB NH-White	42.4%	7.1%	36.3%
CoB NH-Black	0.4%	0.5%	0.4%
CoB NH-Asian/Other	1.2%	0.8%	1.1%
CoB Hispanic	1.7%	31.6%	6.9%
CoB race unknown	1.1%	1.2%	1.1%
Age			
<35	39.9%	40.8%	40.0%
35-54	42.1%	48.1%	43.1%
55+	18.0%	11.1%	16.8%
Sex/gender			
Male	67.0%	67.3%	67.1%
Female	32.1%	31.9%	32.0%
No info available	0.9%	0.8%	0.9%
Income (mean)	109,358.6	84,062.05	104,968.3
Loan type			
Conventional	73.7%	54.4%	70.4%
FHA	15.9%	37.3%	19.7%
VA	8.7%	7.5%	8.5%
RHS or FSA	1.7%	0.7%	1.5%
Property Value	343,987.1	289,586.9	334,545.9
Rate spread (quartile)			
1st quartile	27.3%	13.5%	24.9%
2nd quartile	27.2%	14.9%	25.0%
3rd quartile	24.9%	25.6%	25.0%
4th quartile	20.6%	46.0%	25.0%
Loan-to-value ratio	85.8%	91.3%	86.7%
Debt-to-income ratio			
<36%	41.4%	23.3%	38.2%
36-43%	30.9%	30.8%	30.9%
>43%	27.7%	45.9%	30.9%

FHA = Federal Housing Administration. FSA = Farm Service Agency. NH = Non-Hispanic. RHS = Rural Housing Service. VA = Veterans Affairs.

Source: Author's calculations of 2018 Home Mortgage Disclosure Act data

Aggregate Differences in Hispanic and White Homebuyer Neighborhoods

On average, Hispanic and White homebuyers in 2018 bought homes in neighborhoods with very different characteristics (exhibit 2). The neighborhoods of Hispanic homebuyers are 27.8 percentage points less White, and they have more minorities of all racial and ethnic groups in addition to greater shares of immigrants. These neighborhoods are also more economically disadvantaged, with median incomes that are nearly $12,000 lower and unemployment rates that are 1.7 percentage points higher. They also have 10.6 percent fewer college-educated households, and, finally, Hispanic homeowners are living in neighborhoods with lower homeownership rates and lower median home values.

Exhibit 2

Average Neighborhood Characteristics of White and Hispanic Buyers

Neighborhood Characteristics, 2017			
	Hispanic mean	**White mean**	**Hispanic-White difference**
% NH-White	45.05	72.83	-27.78***
% NH-Black	12.23	7.845	4.380***
% Hispanic	34.47	11.59	22.88***
% NH-Asian	5.247	4.717	0.530***
% Foreign-born	19.73	10.48	9.254***
% in Poverty	13.51	9.163	4.346***
Median income ($)	67,257.8	79,215.1	-11,957.4***
Unemployment rate (%)	6.951	5.289	1.663***
% with 4-year College or Graduate school	28.21	38.80	-10.59***
Homeownership rate (%)	66.38	72.83	-6.451***
Median home value ($)	233,510.5	274,265.8	-40,755.3***
Change in Neighborhood Characteristics, 2000-2017			
	Hispanic mean	**White mean**	**Hispanic-White Difference**
Change in % NH-White	-14.43	-8.552	-5.876***
Change in % NH-Black	1.304	1.083	0.221***
Change in % Hispanic	10.30	4.155	6.148***
Change in % NH-Asian	1.135	1.428	-0.293***
Change in % Foreign-born	19.54	10.40	9.143***
Change in % in Poverty	3.041	2.229	0.812***
Change in Median income ($)	-3960.3	-1863.9	-2096.4***
Change in Unemployment rate (%)	1.280	1.273	0.00655
Change in % with 4-year College or Graduate school	5.724	8.391	-2.667***
Change in Homeownership rate (%)	-5.683	-3.363	-2.321***
Change in Median home value (constant 2017$)	49103.5	51741.2	-2637.7***

NH = Non-Hispanic.
**p < 0.05, **p < 0.01, ***p < 0.001*
Sources: Author's calculations of 2018 Home Mortgage Disclosure Act data, 2013-2017 American Community Survey, and 2000 Census

Hispanics in 2018 bought homes in neighborhoods that experienced more substantial racial and ethnic change since 2000, as well as more socioeconomic decline. While all neighborhoods became more diverse from 2000–2017, average Hispanic buyers bought in neighborhoods that had lost 5.8 percentage points more of their White population and had nearly double the increase in the immigrant population relative to the neighborhoods of White buyers. These neighborhoods also experienced, on average, larger increases in poverty, larger declines in median income, smaller gains in college education rates, larger losses of homeownership, and smaller gains in median home values (although this final difference was, in aggregate, relatively small).

Not only is the average neighborhood of a Hispanic homebuyer less White and more economically disadvantaged than that of a White buyer, but Hispanic buyers are overrepresented in the most segregated and poorest opportunity neighborhoods, whereas White buyers are overrepresented in majority White, economically prosperous neighborhoods. Less than 2 percent of Hispanic buyers bought homes in the top 10 percent Whitest neighborhoods in the study sample, whereas nearly 12 percent of White buyers bought in those neighborhoods. Conversely, 55.3 percent of Hispanics bought in neighborhoods that were majority-minority, whereas only 13.7 percent of Whites did. These trends are paralleled on economic measures. More than one-fifth of Hispanics bought in neighborhoods with poverty rates above 20 percent, whereas just 8.3 percent of White households purchased homes in these neighborhoods. Similarly, 41.5 percent of Hispanic buyers purchased in neighborhoods with incomes below the median, relative to 24.9 percent of White buyers. When looking at the trajectory of these neighborhoods, the results indicate that Hispanic buyers are disproportionately likely to move into neighborhoods experiencing more economic decline. Hispanic buyers are overrepresented in neighborhoods with the largest increases in poverty and declines in median income. They are similarly underrepresented in the neighborhoods with the largest increases in incomes and home values. Finally, Hispanics are more likely to have purchased in urban neighborhoods; 26.4 percent bought in urban areas, relative to 20.9 percent of White buyers.

Contemporary Neighborhoods

Exhibit 3 presents results from regression models on 2017 neighborhood characteristics. Hispanic homebuyers tend to reside in neighborhoods that are 15.2 percentage points less White than those of similar White buyers within the same MSA. Although suburban homeowners bought in neighborhoods with shares of White residents that are 11.7 percentage points higher than urban buyers, moving to the suburbs does not narrow the Hispanic-White gap in neighborhood share of White residents—i.e., although suburban Hispanic buyers purchased in Whiter neighborhoods than their urban counterparts, both urban and suburban Hispanic buyers purchased in neighborhoods with many fewer White neighbors than similar White homebuyers.

Exhibit 3

OLS Models Predicting 2017 Neighborhood Attributes (1 of 2)

	(1) % Non-Hispanic White	(2) % in Poverty	(3) Median Income ($)	(4) Median Home Value ($)
Hispanic	-15.24***	2.974***	-4,330.2***	-33,741.7***
	(1.397)	(0.475)	(788.9)	(3,969.0)
Suburb	11.67***	-4.741***	11,412.2***	-11,755.8*
	(1.033)	(0.367)	(1,387.7)	(5,644.7)
Hispanic x Suburb interaction	0.206	-0.835	-1005.0	10,620.3**
	(1.611)	(0.488)	(966.0)	(4,037.4)
Co-borrower (CoB) race/ethnicity				
CoB NH-White	0.193	-0.0331	-841.9***	-11,976.8***
	(0.151)	(0.0408)	(123.3)	(1,050.9)
CoB NH-Black	-6.752***	0.659***	-2,912.6***	-27,409.2***
	(0.424)	(0.139)	(537.6)	(2,957.2)
CoB NH-Asian/Other	-4.000***	0.152	132.7	-616.8
	(0.364)	(0.0850)	(384.7)	(1,978.8)
CoB Hispanic	-3.788***	0.130	-1,375.9***	-17,362.2***
	(0.364)	(0.0697)	(273.5)	(1,918.8)
CoB race unknown	-0.809**	0.127	-1,018.4***	-9,986.5***
	(0.244)	(0.0671)	(233.9)	(1,540.2)
Hispanic x Co-borrower interaction				
Hispanic x CoB NH-White	10.85***	-2.172***	4,707.7***	19,218.4***
	(0.617)	(0.193)	(445.9)	(2,109.0)
Hispanic x CoB NH-Black	6.976***	-1.878***	3,396.2***	12,934.9***
	(0.828)	(0.255)	(724.4)	(3,223.9)
Hispanic x CoB NH-Asian/Other	8.759***	-2.205***	3,530.1***	6,136.1
	(0.805)	(0.215)	(678.5)	(3,487.5)
Hispanic x CoB Hispanic	1.758***	-0.350**	-225.1	266.8
	(0.428)	(0.129)	(382.2)	(2,304.3)
Hispanic x CoB race unknown	3.681***	-1.015***	918.8	1,778.9
	(0.624)	(0.251)	(595.2)	(2,697.3)
Age				
<35	-0.585***	0.178***	-663.0***	2,219.4**
	(0.117)	(0.0453)	(157.0)	(800.7)
55+	1.238***	-0.0413	-2149.4***	-1,606.0
	(0.303)	(0.0414)	(308.0)	(1,171.5)
Sex/gender				
Female	-0.105	-0.174***	470.3***	5205.4***
	(0.0839)	(0.0274)	(75.28)	(582.6)
No info available	-0.845	0.00838	821.4	239.4
	(0.454)	(0.148)	(565.9)	(2950.5)

Exhibit 3

OLS Models Predicting 2017 Neighborhood Attributes (2 of 2)

	(1) % Non-Hispanic White	(2) % in Poverty	(3) Median Income ($)	(4) Median Home Value ($)
Income (log)	1.876***	-0.491***	2,840.5***	11,791.9***
	(0.325)	(0.111)	(461.1)	(1,240.4)
Loan type				
FHA	-0.633*	0.328**	-1,872.2***	-12,383.0***
	(0.311)	(0.100)	(307.1)	(1,434.8)
VA	0.326	-0.222**	-1,485.0***	-16,454.5***
	(0.372)	(0.0774)	(288.2)	(1,421.1)
RHS or FSA	9.215***	0.267	-1,594.3*	9,902.6**
	(0.940)	(0.204)	(630.8)	(3,748.6)
Property Value (log)	6.601***	-4.618***	26,410.6***	138,866.9***
	(0.855)	(0.404)	(937.8)	(9,051.1)
Rate spread (quartile)				
2nd quartile	0.428**	-0.257***	-1,485.0***	-12,768.4***
	(0.128)	(0.0426)	(270.3)	(2,316.0)
3rd quartile	0.367*	-0.131	-2,144.1***	-12,706.0***
	(0.170)	(0.0705)	(354.9)	(1,672.2)
4th quartile	-0.359	0.463***	-2,569.8***	-8,593.2***
	(0.245)	(0.0830)	(359.3)	(847.7)
Loan-to-value ratio	-0.0616***	0.00824***	-35.13***	-367.4***
	(0.00720)	(0.00178)	(5.781)	(43.43)
Debt-to-income ratio				
<36%	-0.594***	0.206***	-608.9***	-1,032.1
	(0.117)	(0.0307)	(113.5)	(962.6)
>43%	-0.345**	-0.147***	-128.5	-5,197.8***
	(0.123)	(0.0331)	(132.4)	(1,458.6)
Constant	-24.14*	72.61***	-268,986.0***	-1,466,197.5***
	(10.07)	(4.645)	(10,329.0)	(105,972.1)
Observations	1,656,014	1,656,012	1,655,967	1,654,575
Within MSA R^2	0.233	0.199	0.311	0.396

FHA = Federal Housing Administration. FSA = Farm Service Agency. MSA = metropolitan statistical areas. NH = Non-Hispanic. OLS = Ordinary Least Squares. RHS = Rural Housing Service. VA = Veterans Affairs.

Note: Standard errors in parentheses

$^*p < 0.05$, $^{**}p < 0.01$, $^{***}p < 0.001$

Sources: Author's calculations of 2018 Home Mortgage Disclosure Act data, 2013-2017 American Community Survey, and 2000 Census

Hispanic homebuyers tend to purchase in neighborhoods with poverty rates 3 percentage points greater than those of White buyers. As with the findings for the share of White residents, suburban homebuyers tend to buy in neighborhoods with lower poverty rates, but again the gap between Hispanic and Whites is not statistically significantly lower in the suburbs. Differences in neighborhood median income of Hispanic and White buyers also exist, although they are relatively smaller than gaps in the share of White residents and in poverty rates. Hispanic homebuyers tend to purchase in neighborhoods with median incomes that are around $4,300 less than for similar White buyers. Similarly, suburbanizing increases neighborhood median income (by $11,400), but the Hispanic-White gap is not statistically significantly smaller in suburban areas.

Finally, Hispanic homebuyers tend to purchase in neighborhoods with significantly lower home values, despite controlling for the value of the purchased property.[8] The median home value in the neighborhood of a Hispanic homebuyer is nearly $34,000 lower than that of a similar White buyer. The trend with respect to suburbs is different from the other neighborhood variables. In this case, suburban homebuyers tend to buy in neighborhoods where the median home value is lower than in urban areas. However, the Hispanic-White gap shrinks in the suburbs, narrowing to around $23,000. It is notable that the only instance of a narrowed Hispanic-White gap due to suburbanization is in a case in which suburban owners are worse off relative to living in the city.

Results based on the existence and race of a co-borrower also point to continued racial stratification. For White primary borrowers, the existence of a co-borrower of any race (including White) is generally correlated with living in a neighborhood that is economically weaker or with more minority neighbors (or has no significant effect, positive or negative). This is likely due to having already controlled for crucial financial characteristics: once income, home value, and credit characteristics are held constant, households that need two borrowers to achieve the same characteristics as a single borrower are likely more financially precarious, which then translates to poorer neighborhood outcomes. For Hispanics, this trend is often reversed, as households with two borrowers tend to buy in better neighborhoods relative to Hispanic single borrowers. It is possible that dual-headed households with a Hispanic member may be more financially stable, given otherwise similar financial characteristics. As a result, the Hispanic-White neighborhood gap is smaller between households with two borrowers than between single borrowers.

Beyond this difference in having one versus two borrowers, the race of the co-borrower also has important effects on neighborhood characteristics. For White primary borrowers, a Black or Hispanic co-borrower reduces the predicted share of White residents in the neighborhood, median income, and median home value of the neighborhood, while increasing predicted neighborhood poverty (Asian co-borrowers only affect neighborhood race, diminishing the share of White residents in the neighborhood). Although Hispanics benefit from having a co-borrower relative to Whites, this benefit is often not sufficient to overcome the negative effect of a Black or Hispanic co-borrower. Similar to Whites, Hispanics with a Hispanic co-borrower tend to buy in neighborhoods with fewer Whites and lower median income than Hispanics without a co-borrower, and being Hispanic with a Black or Hispanic co-borrower is correlated with neighborhoods with lower home

[8] There may be concerns related to the accuracy of the median American Community Survey (ACS) home value, because it is self-reported and may not accurately reflect recent market conditions. As a robustness check, the author generated means and medians of property value and loan amounts at the tract level using the 2018 HMDA data and reran the home value regression. Across the Hispanic, suburb, Hispanic-suburb interaction, and co-borrower variables, results are qualitatively the same as the ACS findings. Results using median and mean loan values are smaller in magnitude, which is to be expected because loans do not represent the full value of the property. Relative to the national mean of the dependent variable, the use of the ACS predicts a slightly larger effect for Hispanic and the Hispanic-suburb interaction term and a slightly smaller effect for being in the suburbs. Regardless of the measure used for property value, however, the findings remain large and statistically significant.

values. Meanwhile, for Hispanic primary borrowers, having a White or Asian co-borrower is linked to better neighborhood outcomes relative to single Hispanics for all the dependent variables. Having a White co-borrower often counteracts much of the negative effect of being Hispanic; relative to White borrowers, the gap in neighborhood median income is nearly eliminated, and the gaps in the share of White residents and neighborhood poverty are reduced around 75 percent.

Neighborhood Trajectories

The first set of regressions establish that Hispanic homebuyers in 2018 tended to purchase in neighborhoods with more minorities and fewer economic resources than those of similar White buyers residing in the same MSAs. These differences may be mitigated in the long term, however, if these neighborhoods are up-and-coming; if Hispanics are buying in ascendant neighborhoods, they may receive a larger long-term return on their investment. The reverse may also be true—if Hispanics are moving into neighborhoods with declining economic outcomes, especially relative to Whites, homeownership may trap them in poorer neighborhoods and exacerbate the wealth gap over time.

The regression results show that Hispanic homebuyers are purchasing in neighborhoods that have experienced more integration since 2000 but also higher rates of economic decline (exhibit 4). Hispanic buyers purchased in neighborhoods that experienced a loss of White households 3.0 percentage points greater than those of similar White buyers (roughly one-third of the mean). With respect to economic conditions, the neighborhoods of White buyers continued to outperform those of Hispanic buyers, but suburbanization played an important mediating effect on the size of the Hispanic-White gaps. Being a Hispanic buyer is correlated with buying in neighborhoods where poverty had risen more quickly (1.3 percentage points faster), although this effect was alleviated somewhat for suburban Hispanics, for which neighborhood poverty had grown 0.6 percentage point more quickly than the neighborhoods of White buyers. The neighborhoods of Hispanic buyers experienced declining (real) incomes over this time period. These declines were not just more severe relative to Whites, but in urban areas they were larger than mean income declines. Finally, the neighborhoods of Hispanic homebuyers had previously appreciated more slowly than those of White buyers, with a gap of nearly $17,900 for urban Hispanics and almost $7,000 for suburban Hispanics.

Exhibit 4

OLS Models Predicting Change in Neighborhood Attributes, 2000–17 (1 of 2)

	(1) Change in % Non-Hispanic White	(2) Change in % in Poverty	(3) Change in Median Income ($)	(4) Change in Median Home Value ($)
Hispanic	-3.036***	1.264***	-3,014.3***	-17,860.7***
	(0.723)	(0.284)	(643.0)	(2,532.7)
Suburb	-2.396**	0.124	-2,188.1*	-21,733.3***
	(0.837)	(0.286)	(1,099.6)	(6,019.2)
Hispanic x Suburb interaction	-0.384	-0.838**	2,091.2**	11,103.7***
	(0.700)	(0.301)	(656.2)	(2,565.0)
Co-borrower (CoB) race/ethnicity				
CoB NH-White	-0.113	0.180***	-564.2***	-4,391.6***
	(0.0724)	(0.0264)	(102.5)	(481.2)
CoB NH-Black	-2.370***	0.282**	-970.1***	-9,847.7***
	(0.247)	(0.0919)	(272.4)	(1,419.5)
CoB NH-Asian/Other	-1.630***	0.252***	-111.6	890.6
	(0.161)	(0.0510)	(208.1)	(1,475.1)
CoB Hispanic	-1.588***	0.239***	-632.8***	-5,140.0***
	(0.126)	(0.0548)	(171.9)	(759.0)
CoB race unknown	-0.235	0.0646	19.52	-1,437.9
	(0.119)	(0.0469)	(186.6)	(808.5)
Hispanic x Co-borrower interaction				
Hispanic x CoB NH-White	1.825***	-0.625***	1,493.9***	7,366.4***
	(0.422)	(0.130)	(331.2)	(1,149.6)
Hispanic x CoB NH-Black	1.016*	-0.664***	1,482.6***	5,632.8**
	(0.417)	(0.167)	(374.9)	(2,061.4)
Hispanic x CoB NH-Asian/Other	1.698***	-0.533**	179.4	4,368.7*
	(0.409)	(0.170)	(472.7)	(2,153.8)
Hispanic x CoB Hispanic	1.224***	-0.324***	282.4	102.0
	(0.263)	(0.0831)	(185.2)	(1,097.2)
Hispanic x CoB race unknown	0.374	-0.332*	-104.4	-815.4
	(0.399)	(0.159)	(383.6)	(2,300.0)
Age				
<35	0.399***	-0.160***	625.9***	2,650.7***
	(0.0862)	(0.0358)	(95.45)	(427.9)
55+	0.349*	0.00425	-823.0***	-1,791.5**
	(0.147)	(0.0274)	(83.40)	(533.8)
Sex/gender				
Female	0.0594	-0.0606**	93.25	1,991.6***
	(0.0506)	(0.0203)	(50.24)	(376.9)
No info available	-0.187	-0.0154	351.2*	99.29
	(0.154)	(0.0730)	(163.6)	(1,113.0)

Exhibit 4

OLS Models Predicting Change in Neighborhood Attributes, 2000–17 (2 of 2)

	(1) Change in % Non-Hispanic White	(2) Change in % in Poverty	(3) Change in Median Income ($)	(4) Change in Median Home Value ($)
Income (log)	0.404***	-0.309***	710.8***	2,126.3
	(0.0856)	(0.0387)	(96.46)	(1,236.3)
Loan type				
FHA	-0.555***	0.114*	-83.67	-4,129.4***
	(0.100)	(0.0543)	(106.6)	(628.7)
VA	-0.429**	-0.0928	439.0**	-4,584.8***
	(0.150)	(0.0536)	(160.0)	(794.7)
RHS or FSA	4.649***	-0.782***	3,129.3***	9,782.6***
	(0.382)	(0.115)	(377.5)	(2,120.2)
Property Value (log)	2.936***	-2.270***	5,615.3***	46,680.9***
	(0.274)	(0.156)	(548.6)	(4,503.2)
Rate spread (quartile)				
2nd quartile	0.0828	-0.110***	-340.5***	-3,797.1***
	(0.0565)	(0.0286)	(96.78)	(787.3)
3rd quartile	-0.0299	-0.00226	-555.6***	-4,488.9***
	(0.0775)	(0.0342)	(109.8)	(629.1)
4th quartile	-0.0623	0.251***	-646.0***	-3,424.3***
	(0.0973)	(0.0390)	(154.5)	(635.2)
Loan-to-value ratio	-0.0111***	0.00323*	-11.98***	-115.2***
	(0.00229)	(0.00129)	(3.006)	(13.66)
Debt-to-income ratio				
<36%	0.159**	0.00696	84.18	1,056.9
	(0.0494)	(0.0228)	(87.15)	(574.6)
>43%	-0.0828	-0.129***	-44.90	-2,011.8***
	(0.0549)	(0.0210)	(69.22)	(402.3)
Constant	-44.94***	31.79***	-72,529.0***	-510,971.2***
	(3.179)	(1.997)	(6,777.2)	(50,037.2)
Observations	1,652,306	1,651,768	1,651,722	1,649,942
Within MSA R^2	0.0571	0.0558	0.0428	0.167

FHA = Federal Housing Administration. FSA = Farm Service Agency. MSA = Metropolitan Statistical Area. NH = Non-Hispanic. OLS = Ordinary Least Squares. RHS = Rural Housing Service. VA = Veterans Affairs.

Note: Standard errors in parentheses

**p < 0.05, **p < 0.01, ***p < 0.001*

Sources: Author's calculations of 2018 Home Mortgage Disclosure Act data, 2013-2017 American Community Survey, and 2000 Census

Consistent with evidence of suburbanization of minorities and of poverty, buyers in suburbs bought in neighborhoods that had experienced greater change from 2000–2017 than in urban areas: the minority populations grew faster, incomes declined more, and housing values grew more slowly. However, the relationship between suburbs, socioeconomic outcomes, and the closure of

Hispanic-White gaps is different with respect to neighborhood change than in the present. Unlike the results for 2017 neighborhood conditions, living in the suburbs reduces Hispanic-White inequality relative to living in cities. This reduction of inequality, however, takes place in the context of suburban decline rather than improving conditions for all.

Role of Ethnic Affinity?

One question is whether the results are driven by ethnic affinity—the desire of Hispanic buyers to live near other Hispanic households for social or cultural reasons—rather than by structural inequalities or discrimination. The HMDA data (and most other major sources of homeownership data) do not contain attitudinal information on the neighborhood selection of Hispanic homebuyers. However, if Hispanics in MSAs with many Hispanic neighborhoods to choose from behave substantially differently than those in MSAs with few Hispanic neighborhoods, one may intuit a role for ethnic affinity or some other form of structural sorting (Krysan and Crowder, 2017) into neighborhoods based on ethnicity. In the absence of structural inequality, Hispanics in MSAs with small Hispanic populations and few Hispanic neighborhoods should buy in neighborhoods with racial compositions that match those of demographically and financially similar White buyers.

In order to explore this, the author split the 100 MSAs in this study into quartiles based on the total share Hispanic in the MSA. The author then ran three regression models identical to the 2017 models shown previously where the dependent variables are the share of the neighborhood that is White, Black, or Hispanic. These three models were run separately on each quartile, producing 12 sets of results (the predicted share of White residents, share of Black residents, and share of Hispanic residents in the neighborhood for each MSA quartile).

MSAs in the bottom quartile have the smallest Hispanic populations and have relatively few Hispanic neighborhoods. In those MSAs, Hispanics purchased in neighborhoods with 10.1 percentage points fewer White residents and 7.2 percentage points more Black residents than those of similar White buyers in those MSAs. In MSAs with the largest Hispanic populations, Hispanics bought in neighborhoods with 16.3 percentage points fewer White residents than similar White buyers; in these MSAs, Hispanics purchased in neighborhoods with substantially larger Hispanic populations but also with larger Black populations than White buyers. Although the results from the most-Hispanic MSAs suggest that ethnic affinity (or structural sorting) may play a role, the finding that Hispanic households are also more likely to buy in neighborhoods with larger Black populations than White buyers, particularly in MSAs with fewer Hispanic households, implies barriers to access to White neighborhoods for Hispanic buyers.

Discussion

This article asks four research questions on the neighborhoods in which Hispanics are buying homes, how those neighborhoods compare with those of White households, and how suburbanization affects neighborhood differences between Hispanics and Whites. The results indicate that:

1. Hispanics are buying in neighborhoods that differ substantially from those of similar white buyers, with higher shares of minority households, higher rates of poverty, lower median incomes, and lower median home values.

2. Hispanics are moving into neighborhoods that have experienced greater socioeconomic decline since 2000.

3. Hispanics buying in suburban communities often live in neighborhoods that are more socioeconomically advantaged relative to their urban counterparts, although not with respect to median home value or neighborhood change over time.

4. Suburbanization does not mitigate the difference between Hispanic and White homebuyer neighborhoods for most contemporary characteristics. When observing neighborhood change, suburbanization shrinks the gap between Hispanics and Whites, but suburban neighborhoods generally performed more poorly than urban ones.

These results provide three key insights into the relationships between ethnicity, homeownership, and suburbanization. First, access to homeownership alone does not resolve spatial inequity for Hispanic households. Despite having similar financial backgrounds and using similar loan products to buy equally valued homes, Hispanic homebuyers in 2018 bought homes in markedly different neighborhoods than White buyers. Although these neighborhoods may be an improvement for Hispanics over their previous neighborhoods as renters, homeownership itself does not eliminate neighborhood difference and spatial inequity with Whites.

Second, suburbs are ethnically stratified places. Suburbs have a long history of being racially and ethnically segregated from the city. This study contributes to a growing literature on the suburbanization of poverty and suburban decline. Although the neighborhoods of suburban homebuyers were often better than those of urban buyers, and Hispanic buyers can improve their outcomes by moving out of the city, even in suburbs Hispanics buy in neighborhoods with fewer Whites and lower economic characteristics than White buyers, limiting the neighborhood opportunity accessible to Hispanics. The only measured outcome in which the suburban neighborhood gap was statistically significantly smaller than the urban one was median home value. In this case, however, suburban neighborhoods were less advantageous than urban ones, so there is no benefit to suburbanizing besides reducing relative inequality. Additionally, the effects of this stratification are likely to be compounded over time, as Hispanics are more likely to be buying in neighborhoods experiencing racial change and economic decline. This raises the concern that Hispanics may be locked into declining neighborhoods.

Third, homeownership is likely to be a riskier investment for Hispanics than Whites. Despite buying homes of equal value, Hispanic homeowners typically buy in neighborhoods with more minorities and lower economic profiles. These profiles, coupled with the longer-term economic decline of these neighborhoods, may then translate to lower home-price appreciation. Furthermore, the cases in which suburban neighborhood gaps are smaller than in those of cities—with respect to contemporary home values and longer-term economic decline—are ones where suburban neighborhoods are falling behind their urban counterparts. In these cases, rather than a rising tide lifting all boats, inequality was reduced through declining suburbs for both Whites and Hispanics. Conversely, larger differences between Hispanic and White buyers in the neighborhood trajectories of urban neighborhoods suggest that urban Whites are both more likely than Hispanics to reap the positive effects of urban revitalization and that urban Hispanic buyers are particularly unable to access neighborhoods that match those of their White counterparts. In a time when many historically urban ethnic communities are gentrifying, this result is particularly concerning.

Policy Implications

These results are significant to planners and policymakers. Homeownership is heavily subsidized in the United States due to a belief in its financial benefits and in its ability to provide access to neighborhoods of opportunity. But this research suggests that Hispanic homebuyers are less able to use homeownership to access neighborhood opportunity and that there may be new forms of suburban exclusion. Where homeownership takes place is crucial to many of its benefits, from wealth-building to residential stability to access to neighborhood safety and high-performing schools. These results highlight the importance of place-based community development to reduce the inequality across places. They also suggest that there are lingering barriers to residential integration of Hispanic homebuyers that must be addressed to reduce residential inequity.

More research is needed on the sources of this inequity, especially qualitative research on how households make decisions and how various actors in the real estate market, including agents and lenders, influence the neighborhoods and housing options available to Hispanic buyers. Despite fair housing laws banning disparate treatment of minority buyers, audit studies, qualitative research, and investigative journalism find that minority buyers are steered away from majority-White neighborhoods by real estate agents (Choi, Herbert, and Winslow 2019; Korver-Glenn, 2018; Krysan and Crowder, 2017; Turner et al., 2013). Research from Korver-Glenn (2018) points to how discrimination and disparate treatment at various stages of the homebuying process can magnify the effect of discrimination on homebuying opportunities. This research also suggests the importance of enforcement of fair housing law and continued training and education of real estate professionals to reduce these behaviors.

Among policymakers, it is important to remember that not all homeownership is created equal (something that the foreclosure crisis imprinted on practitioners as well). Programs designed to promote low-income and minority homeownership may need to be intentional about promoting spatial integration or to ensure that homebuyer counseling includes discussions of the impact of a neighborhood on homeownership outcomes. These spatial differences also need to be considered when the aim of a homebuying program is to promote neighborhood opportunity (rather than wealth-building, for example) because programmatic goals may not be met. Property tax assessment should also take into account the spatial differences in homeownership. Avenancio-Leòn and Howard (2019) found higher property tax burdens in Black and Hispanic neighborhoods relative to White ones, partly due to differences between the race-neutral tax assessor valuations relative to sales prices, which regularly undervalue homes in minority communities.

Finally, the results of this article, in the context of the literature on suburban homeownership, highlight a paradox between suburban exclusion and suburban decline. Results from the literature indicate that Hispanics are much less likely to access the suburbs than White households, and that even Hispanics with extensive financial resources may have difficulty turning those resources into socioeconomic mobility in the current or next generation, as they are still limited in accessing many high-resource neighborhoods in the suburbs. At the same time, the results in this study point to the segmentation of suburban experiences, because the suburban neighborhoods of Hispanic owners are more likely to have experienced economic decline and substantial demographic change. This paradox suggests that it is important to go beyond discussing suburbs as a monolith. Policies that target residential equity for low-income and minority families cannot simply focus on "opening up the suburbs." Policies need to focus instead on whatever is meant implicitly by suburbs—homeownership, good schools, safe streets, access to the outdoors, etc. To that end, this paradox suggests a need for two-pronged place-based strategies. In some urban and suburban communities, traditional community development strategies are appropriate to improve opportunity in economically disadvantaged areas. In contrast, in exclusive suburban neighborhoods, place-based strategies are needed to facilitate increasing income and racial diversity in those communities, such as diversifying land use and zoning, or explicit use of subsidy. Broad-based land use reforms, such as those passed at the state level with aims to facilitate housing development, may help solve a housing supply problem but may also exacerbate divisions within suburbs. Without sufficient incentives to coax exclusive suburban communities into compliance, development may continue in the small subset of suburban communities that were already more amenable to development, or whose local financial situations more desperately need the financial incentives provided by state governments. As a result, if the goals of these policies are to improve residential integration, not merely to supply more housing, targeting of exclusive communities is needed.

Acknowledgments

The author would like to thank Carolina Reid, Karen Chapple, Cristina Mora, and the anonymous reviewers for valuable input on earlier drafts of this article.

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References

Airgood-Obrycki, Whitney. 2019. "Suburban Status and Neighbourhood Change," *Urban Studies* 56 (14): 935–2952. https://doi.org/10.1177/0042098018811724

Alba, Richard D., and John R. Logan. 1992. "Analyzing Locational Attainments: Constructing Individual-Level Regression Models Using Aggregate Data," *Sociological Methods & Research* 20 (3): 367–397. https://doi.org/10.1177/0049124192020003005

Alba, Richard D., John R. Logan, and Brian J. Stults. 2000. "The Changing Neighborhood Contexts of the Immigrant Metropolis," *Social Forces* 79 (2): 587–621.

Anacker, Katrin B. 2012. "Shaky Palaces? Analyzing Property Values and Their Appreciation in Minority First Suburbs," *International Journal of Urban and Regional Research* 36 (4): 791–816. https://doi.org/10.1111/j.1468-2427.2011.01097.x

———. 2010. "Still Paying the Race Tax? Analyzing Property Values in Homogeneous and Mixed-Race Suburbs," *Journal of Urban Affairs* 32 (1): 55–77. https://doi.org/10.1111/j.1467-9906.2008.00437.x

Avenancio-León, Carlos, and Troup Howard. 2019. "The Assessment Gap: Racial Inequalities in Property Taxation." https://ssrn.com/abstract=3465010

Bayer, Patrick, Fernando Ferreira, and Stephen L. Ross. 2016. "The Vulnerability of Minority Homeowners in the Housing Boom and Bust," *American Economic Journal: Economic Policy* 8 (1): 1–27.

Choi, Ann, Keith Herbert, and Olivia Winslow. 2019. "Long Island Divided," *Newsday*, November 17. https://projects.newsday.com/long-island/real-estate-agents-investigation/

Cortes, Alvaro, Christopher E. Herbert, Erin Wilson, and Elizabeth Clay. 2007. "Factors Affecting Hispanic Homeownership: A Review of the Literature," *Cityscape* 9 (2): 53–91.

Covington, Kenya L. 2015. "Poverty Suburbanization: Theoretical Insights and Empirical Analyses," *Social Inclusion* 3 (2): 71. https://doi.org/10.17645/si.v3i2.120

de Souza Briggs, Xavier. 2007. "More Pluribus, Less Unum? The Changing Geography of Race and Opportunity." In *Neighbourhood Renewal & Housing Markets: Community Engagement in the U.S. & UK*. Oxford: Blackwell, 63–87.

Devaney, F. John. 1994. *Tracking The American Dream: 50 Years of Housing History from the Census Bureau: 1940 to 1990*. U.S. Dept. of Commerce, Economics and Statistics Administration, Bureau of the Census. https://www.huduser.gov/portal/Publications/pdf/HUD-7775.pdf

Diaz, David R. 2005. *Barrio Urbanism: Chicanos, Planning, and American Cities*. Routledge.

Ellis, Mark, Richard Wright, and Virginia Parks. 2006. "The Immigrant Household and Spatial Assimilation: Partnership, Nativity, and Neighborhood Location," *Urban Geography* 27 (1): 1–19.

Faber, Jacob W., and Ingrid Gould Ellen. 2016. "Race and the Housing Cycle: Differences in Home Equity Trends Among Long-Term Homeowners," *Housing Policy Debate* 26 (3): 456–473. https://doi.org/10.1080/10511482.2015.1128959

Fischer, Mary J. 2013. "Black and White Homebuyer, Homeowner, and Household Segregation in the United States, 1990–2010," *Social Science Research* 42 (6): 1726–1736.

Fischer, Mary J., and Travis Scott Lowe. 2015. "Homebuyer Neighborhood Attainment in Black and White: Housing Outcomes During the Housing Boom and Bust," *Social Forces* 93 (4): 1481–1512. https://doi.org/10.1093/sf/sou118

Friedman, Samantha, Joseph Gibbons, and Chris Galvan. 2014. "Declining Segregation Through the Lens of Neighborhood Quality: Does Middle-Class and Affluent Status Bring Equality?" *Social Science Research* 46: 155–168. https://doi.org/10.1016/j.ssresearch.2014.03.003

Friedman, Samantha, and E. Rosenbaum. 2007. "Does Suburban Residence Mean Better Neighborhood Conditions for All Households? Assessing the Influence of Nativity Status and Race/Ethnicity," *Social Science Research* 36 (1): 1–27. https://doi.org/10.1016/j.ssresearch.2005.09.002

Gabriel, Stuart A., and Gary D. Painter. 2012. "Household Location and Race: A 20-Year Retrospective," *Journal of Regional Science* 52 (5): 809–818. https://doi.org/10.1111/j.1467-9787.2012.00775.x

———. 2008. "Mobility, Residential Location and the American Dream: The Intrametropolitan Geography of Minority Homeownership," *Real Estate Economics* 36 (3): 499–531. https://doi.org/10.1111/j.1540-6229.2008.00220.x

Gabriel, Stuart. A., and Stuart S. Rosenthal. 1989. "Household Location and Race: Estimates of a Multinomial Logit Model," *The Review of Economics and Statistics* 71 (2): 240–249. https://doi.org/10.2307/1926969

Goodman, Laurie, Jun Zhu, and Taz George. 2015. "Tight Credit has Hurt Minority Borrowers the Most," *Urban Institute*, April 8. https://www.urban.org/urban-wire/tight-credit-has-hurt-minority-borrowers-most

Hanlon, Bernadette. 2010. "The Decline of Older, Inner Suburbs in Metropolitan America," *Housing Policy Debate* 19 (3): 423–456. https://doi.org/10.1080/10511482.2008.9521642

———. 2009. "A Typology of Inner-Ring Suburbs: Class, Race, and Ethnicity in U.S. Suburbia," *City & Community* 8 (3): 221–246. https://doi.org/10.1111/j.1540-6040.2009.01287.x

Hanlon, Bernadette, John Reggie Short, and Thomas J. Vicino. 2009. *Cities and Suburbs: New Metropolitan Realities in the U.S.* Routledge Taylor & Francis Group.

Hanlon, Bernadette, Thomas J. Vicino, and John Reggie Short. 2006. "The New Metropolitan Reality in the U.S.: Rethinking the Traditional Model," *Urban Studies* 43 (12): 2129–2143. https://doi.org/10.1080/00420980600936525

Hardwick, Susan W. 2008. "Toward a Suburban Immigrant Nation." In *Twenty-First Century Gateways: Immigrant Incorporation in Suburban America*. Edited by Audrey Singer, Susan W. Hardwick, and Caroline B. Brettell. Washington, DC: Brookings Institution Press: 31–50.

Housing Vacancy Survey. 2020. Table 6. Homeownership Rates by Race and Ethnicity. U.S. Census Bureau.

Howell, Aaron J., and Jeffrey M. Timberlake. 2014. "Racial and Ethnic Trends in the Suburbanization of Poverty in U.S. Metropolitan Areas, 1980–2010," *Journal of Urban Affairs* 36 (1): 79–98.

Howell, Junia, and Elizabeth Korver-Glenn. 2020. "The Increasing Effect of Neighborhood Racial Composition on Housing Values, 1980–2015." *Social Problems*. https://doi.org/10.1093/socpro/spaa033

———. 2018. "Neighborhoods, Race, and the Twenty-first-century Housing Appraisal Industry," *Sociology of Race and Ethnicity* 4 (4): 473–490. https://doi.org/10.1177/2332649218755178

Hyde, Allen, and Mary J. Fischer. 2021. "New Faces, New Neighbors? How Latino Population Growth and Lending Expansion Shapes the Neighborhood Racial and Ethnic Composition for White and Latino Homebuyers." *City & Community*. https://doi.org/10.1177/1535684120981344

Jackson, Kenneth T. 1987. *Crabgrass Frontier: The Suburbanization of the United States*. Oxford, England: Oxford University Press.

Kneebone, Elizabeth, and Alan Berube. 2013. *Confronting Suburban Poverty in America*. Washington, DC: Brookings Institution Press.

Kneebone, Elizabeth, and C. Anne Nadeau. 2015. "The Resurgence of Concentrated Poverty in America: Metropolitan Trends in the 2000s." In *The New American Suburb: Poverty, Race, and the Economic Crisis*, edited by Katrin B. Anacker. Ashgate: 15–38.

Korver-Glenn, Elizabeth. 2018. "Compounding Inequalities: How Racial Stereotypes and Discrimination Accumulate across the Stages of Housing Exchange," *American Sociological Review* 83 (4): 627–656. https://doi.org/10.1177/0003122418781774

Krysan, Maria, and Michael D. M. Bader. 2009. "Racial Blind Spots: Black-White-Latino Differences in Community Knowledge," *Social Problems*, 56 (4): 677–701. https://doi.org/10.1525/sp.2009.56.4.677

Krysan, Maria, and Kyle Crowder. 2017. *Cycle of Segregation: Social Processes and Residential Stratification*. Russell Sage Foundation.

Li, Wei. 2014. "How Well do the GSEs Serve Minority Borrowers?" *Urban Institute*, June 5. https://www.urban.org/urban-wire/how-well-do-gses-serve-minority-borrowers

Lichter, Daniel T., Domenico Parisi, and Michael C. Taquino. 2015. "Spatial Assimilation in U.S. Cities and Communities? Emerging Patterns of Hispanic Segregation from Blacks and Whites," *The ANNALS of the American Academy of Political and Social Science* 660 (1): 36–56.

Lichter, Daniel T., Domenico Parisi, Michael C. Taquino, and Steven Michael Grice. 2010. "Residential Segregation in New Hispanic Destinations: Cities, Suburbs, and Rural Communities Compared," *Social Science Research* 39 (2): 215–230.

Logan, John R., and Richard D. Alba. 1993. "Locational Returns to Human Capital: Minority Access To Suburban Community Resources," *Demography* 30 (2): 243–268. https://doi.org/10.2307/2061840

Logan, John R., Richard D. Alba, Tom McNulty, and Brian Fisher. 1996. "Making a Place in the Metropolis: Locational Attainment in Cities And Suburbs," *Demography* 33 (4): 443. https://doi.org/10.2307/2061779

Logan, John R., Zengwang Xu, and Brian J. Stults. (n.d.). "Longitudinal Tract Database." https://s4.ad.brown.edu/Projects/Diversity/Researcher/Bridging.htm

Massey, Douglas S., and Jonathan Tannen. 2018. "Suburbanization and Segregation in the United States: 1970–2010," *Ethnic and Racial Studies* 41 (9): 1594–1611. https://doi.org/10.1080/01419870.2017.1312010

Mikelbank, Brian A. 2004. "A Typology of U.S. Suburban Places," *Housing Policy Debate* 15 (4): 935–964. https://doi.org/10.1080/10511482.2004.9521527

Mills, Greg, and Mary J. Fischer. 2015. "Homeownership Expansion, Suburbanization, and Residential Segregation." In *Race, Space and Exclusion: Segregation and Beyond in Metropolitan America*, edited by Robert M. Adelman and Christopher Mele. Routledge: 23–40.

Murphy, Alexandra K., and Scott W. Allard. 2015. "The Changing Geography of Poverty," *Focus* 32 (1): 19–23.

Pais, Jeremy, Scott J. South, and Kyle Crowder. 2012. "Metropolitan Heterogeneity and Minority Neighborhood Attainment: Spatial Assimilation or Place Stratification?" *Social Problems* 59 (2): 258–281. https://doi.org/10.1525/sp.2012.59.2.258

Pfeiffer, Deidre. 2016. "Racial Equity in the Post-Civil Rights Suburbs? Evidence from U.S. Regions 2000–2012," *Urban Studies* 53 (4): 799–817. https://doi.org/10.1177/0042098014563652

Pooley, Karen Beck. 2015. "Debunking the 'Cookie-Cutter' Myth for Suburban Places and Suburban Poverty: Analyzing Their Variety and Recent Trends." In *The New American Suburb: Poverty, Race And The Economic Crisis,* edited by Katrin B. Anacker. Ashgate, 39–80.

Reid, Carolina K. 2014. "The Promises and Pitfalls of Homeownership." In *The Assets Perspective: The Rise of Asset Building and its Impact on Social Policy*, edited by R. Cramer and T. Shanks. London, UK: Palgrave Macmillan: 123–149.

———. 2007. "Locating the American Dream: Assessing the Neighborhood Benefits of Homeownership." In *Chasing the American Dream: New Perspectives on Affordable Homeownership*, edited by W. M. Rohe and H. L. Watson. Ithaca, NY: Cornell University Press: 233–261.

Rothstein, Richard. 2017. "The Color of Law: A Forgotten History of How Our Government Segregated America." New York, NY: Liveright Publishing.

Shapiro, Thomas, Tatjana Meschede, and Sam Osoro. 2013. *The Roots of the Widening Racial Wealth Gap: Explaining the Black-White Economic Divide*. Institute on Assets and Social Policy. https://heller.brandeis.edu/iere/pdfs/racial-wealth-equity/racial-wealth-gap/roots-widening-racial-wealth-gap.pdf

Suro, Roberto, and Audrey Singer. 2002. *Latino Growth in Metropolitan America: Changing Patterns and New Locations*. Washington, DC: Brookings Institution and Pew Hispanic Center. https://www.brookings.edu/wp-content/uploads/2016/06/surosinger.pdf

Suro, Robert, Jill H. Wilson, and Audrey Singer. 2011. *Immigration and Poverty in America's Suburbs (Metropolitan Opportunity Series)*. Washington, DC: Brookings Institution.

Turner, Margery Austin, Fred Freiberg, Erin Godfrey, Carla Herbig, Diane K. Levy, and Robin R. Smith. 2002. *All Other Things Being Equal: A Paired Testing Study of Mortgage Lending Institutions*. U.S. Department of Housing and Urban Development. https://www.huduser.gov/Publications/PDF/aotbe.pdf

Turner, Margery Austin, Rob Santos, Diane K. Levy, Doug Wissoker, Claudia Aranda, and Rob Pitingolo. 2013. *Housing Discrimination Against Racial and Ethnic Minorities 2012*. U.S. Dept. of Housing and Urban Development. https://www.huduser.gov/portal//Publications/pdf/HUD-514_HDS2012.pdf

Vale, L. J. 2007. "The Ideological Origins of Affordable Homeownership Efforts." In *Chasing the American Dream: New Perspectives on Affordable Homeownership*, edited by W. M. Rohe and H. L. Watson. Ithaca, NY: Cornell University Press: 15–40.

Woldoff, Rachel A. 2008. "Wealth, Human Capital and Family Across Racial/Ethnic Groups: Integrating Models of Wealth and Locational Attainment," *Urban Studies* 45 (3): 527–551. https://doi.org/10.1177/0042098007087334

Wright, Gwendolyn. 1983. "Building the Dream: A Social History of Housing in America." Cambridge, MA: MIT Press.

Hispanic Homeownership Advancement through Recession and Boom: Tracking Cohort Aging and Replacement with 5-Year American Community Survey Data in the United States, Los Angeles, and a Gentrifying District

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Abstract

Aging baby boomers create an imbalanced age structure in the housing market, while the growing numbers of younger Hispanic homeowners hold potential to absorb the growing elderly sell-off. This article addresses the gap between Hispanic and White homeownership. It quantifies the volume of homeownership entrances and exits in different ages in recent years, distinguishing periods of recession and boom. A novel method is proposed for measuring cohort life-cycle flows into and out of homeownership with the recently released 5-year files from the American Community Survey. This method captures the market slowdown during the Great Recession downturn, followed by a strong recovery after 2014. Findings from the cohort life-cycle method are starkly contrasted with misleading measurements derived from simple age group growth in the same periods. The crucial importance of growth in Hispanic homeowners is investigated at multiple levels of geography. Changes tracked in 10-million-resident Los Angeles County resemble a U.S. future of fewer older White homeowners being replaced by a large and growing Hispanic resident base. Contrasting this, in a gentrifying district near downtown Los Angeles, we find Hispanics are the departing elderly and Whites (and Asians) are the young replacements.

Introduction

Homeownership has been on an unstable rollercoaster in the first 2 decades of this century. The nation's homeownership rate rose to record heights from 2000 to 2006—from 66.2 to 67.3 percent—but the financial crisis of 2008 precipitated a sharp decline to 63.9 percent by 2012, 3 years after the official end of the Great Recession.[1] Still, the national rate continued to decline, finally bottoming at 63.0 percent in 2015. The homeownership rate slowly began to rise, reaching 64.1 percent in 2019.

Hispanic homeownership has increased more strongly than average homeownership during boom periods (Painter and Yu, 2014). However, the Hispanic rate also has pulled back in the aftermath of recessions. Reasons for this stronger increase rest on the strengthening economic foundations of the Hispanic populations and the especially rapid progress of immigrant Hispanics (Myers and Lee, 1998; NAHREP, 2019).

Less visible, but of greater dynamic consequence, is the age structure of the Hispanic homeowners, who are younger than other homeowners, especially in contrast to the much older White homeowners who dominate the housing market. Indeed, the homeownership rates of White households ages 70–74 are the highest of any age and ethnicity in the housing market (85.0 percent). In fact, as will be shown, the bulk of growth in homeownership is found above age 55, and little weakness is observable in the strength of this demand. Yet this large reservoir of homeowners is also shedding homes for sale as cohorts pass through late in life. Temporarily, even larger Baby Boomer cohorts are replacing those being lost from the older age group, but the already large outflow is increasing, and replacements will eventually dwindle (Myers and Ryu, 2008; Simmons and Myers, 2018).

Evidence developed here shows that the elderly sell-off proceeded at the same pace during both the last recession period and the mid-2010s recovery. The young and middle-aged Hispanic cohorts are a growing resource of new homeowners, while White households are net sellers. However, young and middle-aged adults of all races are shown here to have been much less likely to invest in homeownership during the recession and the lingering aftermath than they were in the second half of the decade in prosperous times of economic expansion.

The picture provided by the nation as a whole is a useful summary, but the dynamics and outcomes could differ substantially in specific metropolitan areas or key subareas due to a host of geographic reasons (Sanchez-Moyano, 2020). We analyze the changes more specifically in Los Angeles County. This very large and diverse region is home to one of the largest and longest established Hispanic or Latino populations in the United States. Compared to White homeownership in Los Angeles, the Hispanic homeownership gap is also among the lowest in the nation, as to be presented, and yet housing prices are presently also among the highest. An excess of home sellers has the potential to require softened prices to stimulate a comparably large volume of replacement demand. This risk seems remote in 2021, given the extremely low turnover and currently acute inventory shortages in the existing housing stock. Even though aging is destined to proceed, traditional age group analysis conclusions may fail to reflect that process. This analysis offers a more reliable alternative.

[1] Homeownership rates are from the American Community Survey (ACS) and the decennial census. An alternate series is the Housing Vacancy Survey, which is issued quarterly based on a much smaller sample and yielding slightly higher estimates that follow the same trend pattern as the ACS/decennial.

Specific neighborhoods do not always follow the metropolitan or national pattern of change. When homes for sale are in short supply, one consequence is that prices are bid up. Another is that an overflow of home seekers may spill into neighboring areas that offer more affordable opportunities (Goodman, Seidman, and Zhu, 2020). Undergirding this price competition are the demographic trends of supply and demand. The Highland Park/Eagle Rock district in the northeast of the city of Los Angeles, a majority Hispanic subarea some 5 to 8 miles north of city hall, affords a microstudy of gentrifying dynamics in Los Angeles County as a whole. There we find it is the older Hispanic homeowners who are leaving the area, while it is young White—and also Asian—homeowners who are the replacements moving in, the opposite generational and racial dynamics that are playing out in the region as a whole. Ironically, even as Whites decline as a share of all homeowners in the nation and Los Angeles County, their presence grows in Highland Park/Eagle Rock and other central areas.

We propose a cohort life-cycle advancement method tailored to the newly available 5-year data from the Census Bureau's American Community Survey (ACS). This method estimates changes over time that are consistent with a narrative of life-cycle progress that also varies by historical position in the business cycle, whether a period of recession or booming recovery. Drawing on the cohort longitudinal approach in housing demography (Myers, 1999), we develop a method tailored to exploiting the three ACS files spaced 5 years apart in history. The newest file pools cases collected in 2015 through 2019 and can be compared to the first file offered from the ACS, covering 2005 through 2009. Thus, these two files span a full decade, which enables analysis of cohorts growing 10 years older. However, even greater insight is enabled by adding a third file covering the period between the other two, 2010 through 2014. This enables tracing cohorts as they grow 5 years older and advance through their housing life cycle.[2]

More importantly, this "in-between" dataset represents the depth of the Great Recession and its depressed aftermath, whereas the two other files represent homeownership accumulated in the boom preceding the recession and in the boom that follows the recession. Tracing gains and losses in homeownership *from boom-to-bust-to-boom*, disaggregated by age cohorts and by race or Hispanic origin, holds strong potential to shed useful light on the demographics of homeownership change among Hispanic, White, and all households. In essence, we capture the net entrances and exits from homeownership in each age group in each period, reflecting the true pattern of growing and declining demand. This application of cohort methods over the business cycle has rarely been attempted. However, the new ACS data make that readily possible for every state and large county or city in the United States.

The following section surveys the metrics of homeownership by Hispanic households, addresses the important Hispanic-White homeownership gap, and compares other measures that enable supportive insights. These include measures of shares of *growth* (important due to Hispanics' large and growing population presence), age differences (important for the implications of Hispanics' younger age than the White homeowners), and cohort measures important for tracing net accruals through key ages in both recessions and housing booms.

[2] The ACS 1-year files can be used to compare more precise, single-year dates that are spaced 5 years apart; however, those files have much smaller sample sizes and are far less accurate for describing smaller urban areas. For that reason, the 5-year files are the most commonly used in urban analysis.

We then introduce our detailed data for fine-grained analysis, namely the three nonoverlapping 5-year files of the ACS. Next, we explain our strategy for studying the change in Hispanic homeownership over the last 15 years of the housing boom, Great Recession, and the long recovery preceding the 2020 pandemic recession. We also discuss the comparative strategy for different levels of geography.

Next, we present a close examination of Hispanic and White homeownership by age and how they have changed from boom to bust and back to boom. First, we use the traditional age-specific homeownership rates to compare recent changes in access to homeownership between Hispanics and Whites in both the United States and Los Angeles (LA) County. Second, we present a head-to-head comparison of the standard growth measurements by age group with the cohort life-cycle advancement measurements, both using the same ACS data. We spotlight some extreme differences in results and evaluate the improvements to plausibility made by the new cohort advancement method. The contrast of approaches under both recession and recovery conditions clarifies the great advantage of the cohort advancement formulation. Among other things, this explains why the Hispanic-White homeownership gap has narrowed so greatly in Los Angeles.

Finally, we bring this investigation of Hispanic homeownership change down to the neighborhood level, finding different outcomes in diverse neighborhoods of the Highland Park/Eagle Rock district in northeast Los Angeles city. Long settled by Hispanic residents, as well as White and Asian (Filipino) residents, and with growing homeownership, the Great Recession stunted gains among the young of all races, but elderly losses proceeded from the ranks of long-established Hispanic owners. This is the opposite of the county-wide pattern of older White homeowners being replaced by younger Hispanics and Asians. Since 2014, losses of older Hispanic homeowners continued, while the emergence of young White and Asian homeowners has escalated to replace them. The net result is that the Hispanic share of homeowners, which had increased since 1990 by 10 percentage points in this subarea, has reversed in the last decade by 7 percentage points.

The conclusion addresses implications for knowledge about Hispanic homeownership and spotlights important findings that can be replicated in other urban areas by applying the cohort life-cycle advancement method to the newly available three sets of 5-year ACS data.

Metrics of Hispanic Homeownership

A variety of different metrics are used to describe the status of Hispanic or other groups' homeownership. Each metric provides a different insight or emphasis and can be used with different data. Although we will be developing innovative methods for use with new data, it is helpful to see these first in the context of more standard metrics.

Different Metrics Provide Different Views

A listing of metrics in use includes the following (but the listing is not exhaustive):

1. Size of a group expressed as a share of the total.

2. Growth "impact" of a group expressed as a quantity of change.

3. Growth rate expressed as a percentage rate of change.
4. Growth “importance” expressed as a share of the total change.
5. Success of a group expressed as a percentage that are homeowners.
6. Disadvantage expressed by the homeownership gap, the disparity between a reference group and the group for attention, e.g., the Hispanic-White homeownership gap.
7. Life-cycle differences measured by comparison of age group and homeownership status at a moment in time.
8. Cohort advancement of a group specified by generation, a 10-year or 5-year birth group that is passing between successive age groups in the life cycle as time passes.
9. Geographic similarity of exceptionality discovered by comparison of status in a specific place with the average status for a broader geographic reference area (e.g., comparison to a state or the United States as a whole).

The previous list focuses on homeownership status, and we could substitute other indicators of housing well-being, such as rent affordability or overcrowding.

All of these metrics are applied to make points in this paper. But the first metric of shares of a total provides a simple introduction to this report’s topic. Hispanic people constitute a much smaller share of homeowners (9.7 percent) in the United States than their share of the total population (18.0 percent), as shown in exhibit 1. Their share of renter households (19.3 percent) is slightly greater than their population share. The fact that the Hispanic share of all households (13.2 percent) is less than the population share implies that Hispanic households have a greater number of persons per household than average in the population, although a very small percentage of people do not reside in households but in group quarters (or who experience homelessness). The small homeownership share is also reflected in other metrics for disparities, which we turn to next.

Exhibit 1

Hispanic and Other Race Shares of Population, Households, and Housing in the United States, 2019*

	Hispanic (%)	White, NH (%)	Black, NH (%)	Asian, NH (%)	Other, NH (%)	Total (%)	All Races
Population	18.0	60.7	12.3	5.6	3.4	100	324,697,795
Households	13.2	67.5	12.1	4.8	2.4	100	120,756,015
Owners	9.7	76.0	7.9	4.5	2.0	100	76,869,907
Renters	19.3	52.6	19.4	5.4	3.3	100	43,886,108

NH = non-Hispanic.
Notes: The date marked by 2019 denotes the 5-year American Community Survey file collected from 2015 to 2019. Numbers may not total 100 percent due to rounding.*
Source: Analysis with American Community Survey IPUMS, 2015–2019

Race and Age Disparities of Homeownership

The Hispanic homeownership gap is a widely recognized metric for representing inequality of access to homeownership (Cortes et al., 2006; NAHREP, 2020). This is a problem because homeownership has been the major pathway to wealth accumulation among the middle class (NAHREP, 2020; Strochak,Young, and McCargo, 2019). The homeownership prevalence among households, defined as the homeownership rate, is subject to substantial disparities between White and Hispanic households, as well as with other races. In the United States, the homeownership rate among White, non-Hispanic, households, 71.7 percent, is the highest of any group, some 24.9 percentage points above Hispanic households (46.8 percent), as shown in exhibit 2. Homeownership of Black households is a little below that (41.7 percent), while homeownership of Asian and Pacific Islander households has a smaller gap (-12.7 percentage points) as compared with Whites.

Similar disparities are found in Los Angeles County, but with key differences. In general, the median house price in Los Angeles County reached a pre-pandemic peak in 2019 of $650,000 (compared to $240,500 in the United States), and the total homeownership rate was nearly 20 percentage points lower, 45.3 percent, compared to the United States (exhibit 2). All racial disparities with White homeowners are smaller in Los Angeles County, particularly Hispanic homeowners. The Hispanic homeownership gap is only 15.2 percentage points relative to White homeowners in Los Angeles, compared to 24.9 percentage points in the United States. Reasons for this narrower gap are yet to be determined. However, part of the reduction in disparity is that White homeownership is more sharply reduced in Los Angeles than any other group. Additional factors may include the large sell-off by older White homeowners, removing those who typically have the highest ownership rates, as explored in the following paragraphs.

Even greater than race disparities are the age disparities between young adults, represented by ages 30–34, and the generation 40 years older, 70–74. This age gap amounts to 30.6 percentage points in the United States and 38.0 in Los Angeles among Hispanic households. However, among White households, the respective gaps are far greater in Los Angeles (29.6 percentage points in the United States versus 48.2 in Los Angeles). In fact, the age gap is some 10 percentage points greater in Los Angeles among Whites than it is among Hispanics, and the lagging homeownership among White households explains in part why the racial homeownership gap is smaller in Los Angeles (exhibit 2).

These age disparities require close attention because of their magnitude and differences between Hispanics, Whites, and others. The age gap takes on critical importance due to the total sizes of different generations that may be impacted. With a large generation with high homeownership preparing to relinquish their homes, younger generations will need to step up. However, prices are very high in Los Angeles, in particular. The wide gap in ownership rates between young and old indicates that the necessary step is a very long stretch.

Exhibit 2

Disparities of Homeownership Rates by Race and Age, the United States and Los Angeles

	Hispanic (%)	White, NH (%)	Black, NH (%)	Asian, NH (%)	All Races
UNITED STATES					
All Ages	46.8	71.7	41.7	59.0	63.7
Race Gap	– 24.9	0.0	– 30.0	– 12.7	
Selected Ages					
30–34	33.2	54.8	20.4	39.0	44.8
70–74	63.8	84.4	62.9	73.1	80.3
Age Gap	30.6	29.6	42.5	34.1	35.5
LOS ANGELES COUNTY					
	Hispanic (%)	**White, NH (%)**	**Black, NH (%)**	**Asian, NH (%)**	**All Races**
All Ages	38.1	53.3	33.4	52.9	45.3
Race Gap	– 15.2	0.0	– 19.9	– 0.4	
Selected Ages					
30–34	20.0	23.5	11.5	33.1	22.4
70–74	58.0	71.8	56.7	64.8	65.3
Age Gap	38.0	48.2	45.3	31.7	43.0

NH = non-Hispanic.

Source: Analysis with American Community Survey IPUMS, 2015–2019

New Opportunities with the American Community Survey

We have already used data from the ACS, but this deserves a better introduction for its important new opportunities. In December 2020, the Census Bureau released its newest 5-year data collected in the ACS during 2015 through 2019. Data pooled this way yield a larger sample size and provided the only data available for small areas such as neighborhoods. The larger sample also makes it possible to study very small subgroups, such as small minorities or very finely specified age groups. A special feature of the new data release is that the ACS has three, nonoverlapping datasets for the first time, covering 2005–2009, 2010–2014, and 2015–2019. These are fortunately timed and offer the remarkable potential for dynamic observation of Hispanic homeownership attainment.

Data Timing for Representation of Recession and Recovery

Data in the ACS are collected monthly on a year-round basis, then assembled into 1-year or 5-year datasets. The first 5-year dataset, 2005–2009, collected data in years that reflected the achievements during the housing boom and the first years of the Great Recession. While current economic activity turned sharply downward in 2008, homeownership status is lagged because it accumulates past homebuying. If the ACS was fully operational 2 years earlier, an earlier data collection window would be ideal, but given the 2005–2009 data collection period, we can use that to represent the 2000s' housing boom, acknowledging that our measure of these conditions is slightly muted.[3]

The second dataset, 2010–2014, collected data during the deepest period of the recession effects and its lingering aftermath. The year with the fewest movers to owner-occupancy was 2011 (3.37 million), and the number did not rise above 3.8 million until 2014. House prices in the nation also did not begin to rise in real dollars until 2014. Poverty and income did not appreciably change from their recession levels until 2013 and 2014, respectively (Myers and Park, 2020). The Great Recession was distinguished by an unusually prolonged economic recovery. The third dataset, 2015–2019, captures the effects of the robust recovery, which was especially strong in homeownership after 2016 when the national homeownership rate began to rise for the first time since 2005.

Although this sequence of 5-year data collection periods does not capture a sharp picture of a "boom," as in the single year of 2006, or of "recession effects" as in the single year of 2011, nor of "robust recovery" as in the single year of 2018; nonetheless, the 5-year windows provide a reasonable approximation, especially in light of the lagged accumulation status of homeownership attainment. For simplicity of communication, we can assign these data a shorthand based on their final year of collection, 2009*, 2014* and 2019*, employing the asterisk to indicate the end of a 5-year collection. Thus, these datasets are spaced 5 years apart, and we can use that to our advantage. The interval between the first two datasets corresponds to the change from the boom period to the recession period. That change represents "recession" effects, while the change from the middle to third dataset corresponds to the impact of "recovery." Thus, these three datasets are strategically timed to the good fortune of researchers.

In addition, this systematic 5-year spacing also allows us to investigate some intricate changes as cohorts pass 5 years in age from one period to the next, growing older and demanding housing, alternatively under recession or recovery conditions. We expect that the changes to homeownership behavior may be substantially different at different ages.

Homeownership Growth over 5 Years Instead of 10 Years

It might seem convenient to simply use the two datasets 10 years apart, 2005–2009 and 2015–2019, assuming we do not need to observe 5-year changes in age groups. However, even for total changes, the crucial advantage of studying the separate 5-year changes is a representation of recession and recovery effects. Consider the difference between the 10-year and 5-year measurement of changes in the number of homeowners observed among Hispanics and different races (exhibit 3).

[3] In the 2005 to 2009 time span, annual data indicate an average of 5.0 million movers to owner-occupied homes per year, but in 2008, the volume of these buyers dropped to 4.4 million, and in 2009 it fell further to 3.7 million. How much this reduced the representation of "boom" can be roughly estimated thusly: If the pace of buying in two of the strongest years in the period were used as the standard for "boom," that would average 5.46 million per year. Buyers in 2008 fell 19.7 percent short of this, and in 2009, 31.8 percent short. Each of these two shortfall years carried only a one-fifth weight in the 5-year data, and after weighting, the two together contributed a 10.3 percent dampening of the measure of boom conditions when using the 2005–2009 dataset.

Exhibit 3

Changes in the Number of Homeowners over 5-Year Periods

UNITED STATES						
	Hispanic	White, NH	Black, NH	Asian, NH	Other, NH	All Races
Change						
2009* to 2019*	1,434,617	– 1,237,186	42,242	906,948	365,307	1,511,928
2009* to 14*	455,550	– 1,681,526	– 98,446	346,914	141,646	– 835,862
2015* to 19*	979,067	444,340	140,688	560,034	223,661	2,347,790
LOS ANGELES COUNTY						
	Hispanic	White, NH	Black, NH	Asian, NH	Other, NH	All Races
Change						
2009* to 2019*	12,222	– 95,159	– 14,479	47,298	7,968	– 42,150
2009* to 14*	– 9,800	– 57,050	– 9,483	21,462	5,251	– 49,620
2015* to 19*	22,022	– 38,109	– 4,996	25,836	2,717	7,470

NH = non-Hispanic.

Source: Analysis with American Community Survey IPUMS, 2005–2009, 2010–2014, and 2015–2019, each identified by the labels of, successively, 2009, 2014*, and 2019**

Hispanic households' homeownership increased by 1.434 million owners in 10 years, while among all races, homeownership increased by 1.511 million owners. Accordingly, by the share of growth "importance" metric, Hispanics accounted for virtually all (94.9 percent) of the nation's total gain in this period. However, Asian and Pacific Islanders also contributed to growth in homeownership, adding 907,000 owners, and they could be said to account for 60.0 percent of the national gain. What enables the two shares of growth together to exceed 150 percent is that White, non-Hispanic households experienced a *decline* of 1.237 million owners, or -81.8 percent of the total gain.

The 5-year picture of recession followed by recovery yields a puzzling insight (exhibit 3). White and Black households are the only ones to experience net losses in homeownership during the recession. Hispanic households achieved a net increase of 455,000 owners, more than any other group, despite the nation suffering a loss of 835,000 owners. The massive 1.681 million loss among White households outweighs the gains of others. The fact that White homeownership suffered such loss in the recession while Hispanic owners flourished might contradict expectations. A weakness of the share of growth metric is that it is calculated based on net changes of the whole, not a count of individual foreclosures or other hardships. In fact, as we will find later, the net decline for Whites is concentrated in elderly age groups, and a very different, more realistic picture emerges if we compare young Whites to young Hispanics.

In the subsequent 5-year recovery period, all groups enjoyed net increases in homeownership. Again, Hispanics have the largest gains, although amounting to less than half of the total. As will be shown in the following paragraphs, the revival of young households' homeownership is key to these gains. However, in Los Angeles, White homeowners declined in number even during recovery, as did Black homeowners, who were older and long settled in Los Angeles, like Whites. It bears emphasis in this analysis that we do not attempt to link the expansion and contraction of different racial groups in a causal order. From these data we cannot determine even that Hispanic homeowners have purchased homes from Whites or Blacks, or from new builders. All that is known is that the exits by older homeowners and their succession by younger ones follows a sequence of life-cycle advancement. Outmovers need to occur before inmovers find opportunities in the existing stock. Thus, the role of particular age groups requires closer attention.

Cohort Gains and Losses in Homeownership

Age Perspective

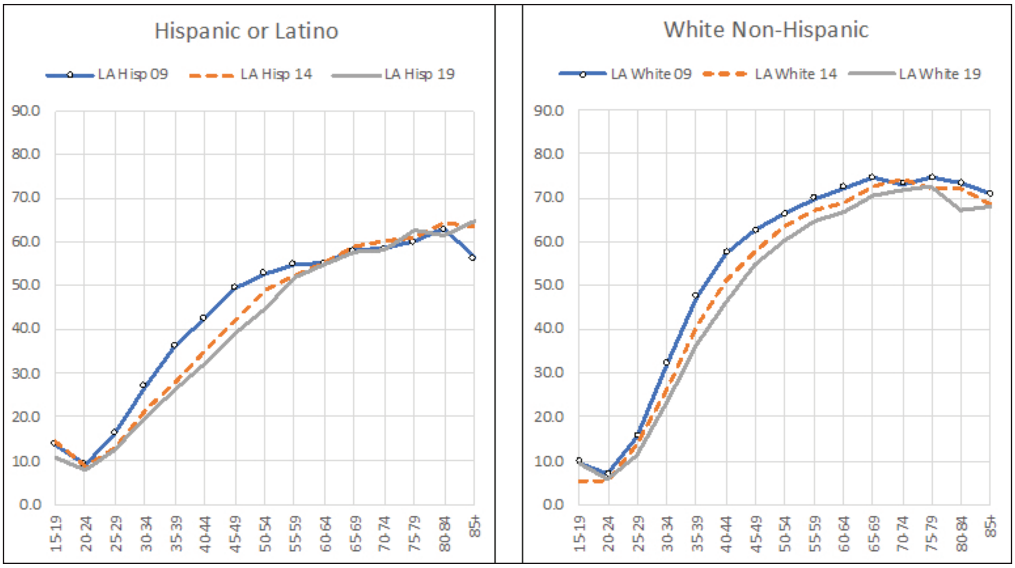
The familiar metric of homeownership success by age groups is based on the percentage of households living in owner-occupied homes at each age of the householder, i.e., age-specific homeownership rates. These rates are compared over time in Los Angeles County and between Hispanic and White households (exhibit 4). The three points in time—2009*, 2014*, and 2019*—are calculated from the 5-year ACS datasets. As described previously, essentially, the three points in time represent the culmination of the boom period of the 2000s, the full impacts of the Great Recession, and then the culmination of the 2010s' housing boom before the pandemic. The White, non-Hispanic homeownership rates in the United States stand well above those for Hispanics or Latinos, 11.0 percentage points higher in 2009* when measured at age 40–44. Comparing the United States to LA County, the LA rates fall well below their U.S. counterparts. That LA disadvantage increases over the study period.[4]

With age, homeownership rates rise dramatically and do not peak until people reach their 70s. If more of the population is older, presumably we have more homeowners, although with more young adults we have more potential homebuyers in future years. However, comparing the lines for each period shows how much change occurred after 2009*, especially among Hispanics and particularly in Los Angeles (exhibit 4).

[4] Whereas the U.S. White homeownership rate at age 40–44 of 76.0 percent fell 5.6 percentage points from 2009* to 2019*, the U.S. Hispanic rate fell 9.2 points. Meanwhile declines in LA were twice as great among Whites, declining by 11.2 percentage points, while the Hispanic rate declined by 10.5 points, similar to the U.S. decline.

Exhibit 4

Homeownership Rates by Age Group in Los Angeles County, Comparing Hispanic and White, in 2009*, 2014*, and 2019*



LA = Los Angeles.

Notes: Data are labeled by the last year in their collection period: 2009 (2005–2009), 2014* (2010–2014), and 2019* (2015–2019). The recession period is reflected by the change between 2005–2009 and 2010–2014, while the recovery period is between 2010–2014 and 2015–2019.*

Source: 5-year American Community Survey IPUMS

What is alarming is how much these age rates of homeownership have decreased in just the last decade, without any substantial rebound. Between 2009* and 2014*, the Great Recession negated homeownership gains among Hispanics that would have been expected under the 2009* rates. For example, a Hispanic household with a 36.2 percent homeownership rate in the 35–39 age group in 2009* would have been expected to rise to 42.7 percent homeownership when reaching ages 40–44 5 years later, but instead the 2014* data found a homeownership rate of 35.3 percent at that older age, more than 7 percentage points lower than expected (exhibit 4). All age groups younger than 60 revealed this slump during the recession years. Even by 2019*, the homeownership rates for middle-aged Hispanics have not bounced back to what they were before the Great Recession. Nor have they bounced back for White households in Los Angeles. Ground that was lost at age 35 is not readily made up at age 45, especially when house prices have returned to their previous high levels. Yet, the setbacks for Hispanic households are particularly pronounced, reflecting their greater exposure to foreclosures when the housing bubble burst (Myers and Lee, 2016; Rugh, 2015).

The Longitudinal Cohort Alternative for Measuring Change

The last 15 years have been an especially volatile era. We can best capture the legacy effects on housing careers by tracing cohorts as they pass through their life cycle over time. The cohort longitudinal approach has the advantage of better representing the direction of change, as well as differences with preceding cohorts (Myers, 1999). To answer questions about Millennials moving into their 30s or Baby Boomers entering their 70s, tracked cohort changes are necessary. We simply "connect the dots" on cohorts that are 5 years older every 5 years, traced from boom (2009*) to bust (2014*) to boom again (2019*). Thus, the new ACS data allow us to measure cohort progress through the boom-bust-recovery cycle.

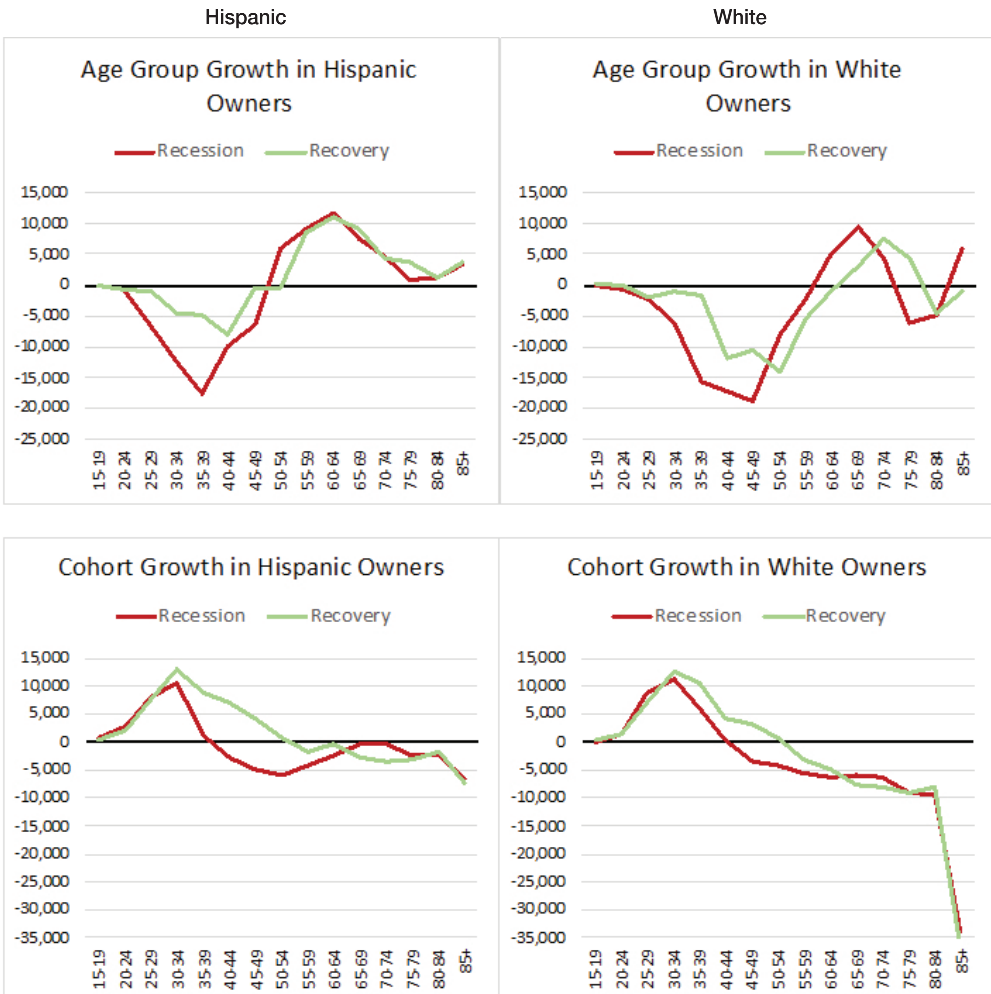
By contrast, the common comparison of age groups over time is a static comparison that does not follow any group's housing progress as they grow older through a given period of history. As will be demonstrated, the simple age method for estimating changes yields estimates and conclusions that are misleading or even nonsensical. These faults are clearly exposed in the case of estimates of homeownership change during recession and recovery.

The shortcoming of relying on simple age group change is clearly illustrated here in Hispanic and White homeownership in Los Angeles County (exhibit 5). However, a very similar pattern of comparison is found for the United States (not shown). The top pair of plots show age group growth, measured by subtraction *within* each age group of the numbers of homeowners observed at two points in time. The losses in homeownership among young Hispanic and White owners could be plausible in a recession. However, two major anomalies loom large. In *both* recession and recovery, this age group method produces massive, almost identical *gains* in middle age and early elderly years that seem nonsensical. First, *how is it possible to achieve such large gains in a recession?* Secondly, *why is there such an escalation in homeownership so late in life?* The graphs of homeownership rates shown previously clearly begin to level off after age 50 (exhibit 4).

Together, the graphs of homeownership change by age group (upper plots of exhibit 5) appear to reflect changes among both Hispanics and Whites that are contrary to expected behavior: homeownership grows at *older ages*, growing *even* in the recession, and in the White graph, it *falls even in recovery*. Further, in the Hispanic graph—or the White graph as well—why is homeownership growing so much more during the recovery phase for people over age 50 than for those who are closer to age 30 and in the expected age for greatest homeownership increase (based on the upward curves of exhibit 4)?

Exhibit 5

Homeowner Growth by Age Groups Compared to Growth by Cohorts from Late 2000s to Late 2010s, Los Angeles County



Recession = (2005–2009 to 2010–2014); Recovery = (2010–2014 to 2015–2019).
Source: Analysis by authors; American Community Survey 5-year files

The alternative plots of homeowner growth or loss by cohorts as they *pass between* age groups yield very different findings (lower plots of exhibit 5). They compare a later age group to the one 5 years younger when observed 5 years earlier (because cohorts grow older over time). The resulting changes are almost the reverse of the age group changes: the greatest increase in homeownership is found among young adults, not older adults. That matches the steep upward age curve of homeownership rates in exhibit 4. However, an apparent inconsistency with those homeownership rates is that the cohort changes show *decreased* homeownership in elderly years, even though their age-group homeownership rates are extremely high. How is that apparent inconsistency explained?

Here we find clearly illustrated two main points in explaining differences between age group and cohort changes. Foremost, the growth and decline in age groups do not reflect behavior but differences in underlying age group size, which is carried forward by cohorts to their next older age group every 5 years. The aging of large Baby Boomer cohorts carries ever-larger groups of homeowners into older brackets, regardless if it is a period of recession or recovery. However, the cohort plots, in contrast, measure the net accumulation of homeownership when each cohort enters the next age range, not the differences in size between one cohort and the next. Thus, we find rapid surges into homeownership at young ages, very little changes after age 50, and then a steep drop off at the end of life.[5] In the late-in-life age groups, the behavior is to downsize, exit from homeownership, move to retirement homes, or exit from housing for health reasons or death. These exits are not reflected in the high homeownership rates in old age because those rates are only calculated for people who live in housing and run their own households, not including those who left the housing market in old age because they died, moved in with relatives, or moved to assisted living.

Finally, granted that the cohort changes are the more plausible way of representing real gains in homeownership over time, at least among older households, how should we explain the rapid *increase* in homeownership *at young ages* during recession conditions? The answer is that young people face urgent pressures to form households, marry, and start families, all of which can motivate homebuying (Myers, Lee, and Simmons, 2020), and they are reaping income gains from their newly established careers, although the increases during a recession are much less than in a recovery. Even in the worst homebuying year of the Great Recession—2011—nationwide, there were 944,211 new owner-occupants age 25–34, down from 1,698,359 in 2006 (a decrease of 44.4 percent). Cohort increases are sizable because people move from very little homeownership at age 20–24 to many times more at ages 25–29 or 30–34, even if that advancement is stunted in a recession. In fact, the most worrisome discovery here is how precarious ownership gains are for middle-aged households. Gains in a recession are completely blocked in the nation as a whole and even reversed in Los Angeles for cohorts in their 40s and 50s.

The conclusion of this comparison between simple age group comparisons and cohort life-cycle advancement is that only the cohort life-cycle advancement reflects net results of home buying and selling over time that could be considered realistic and practically relevant. The cohort estimates better match expected age-related behavior in both recession and recovery periods and for both Hispanic and White households. We can apply the cohort method further.

Adding Up Losses and Gains to Cohorts in Recession and Boom

The cohort life-cycle advancement method, applied to the sequence of 5-year ACS datasets, can be applied to all ethnoracial groups, summing their effects within each age group that the cohorts occupy at the end of the recession or recovery periods. This provides a practical measure of the net

[5] One reason the late-in-life downturn in homeowners appears so steep among White households is that 75 thousand owners in LA County were ages 80 and older in 2010–2014, compared to 20,000 Hispanic homeowners of that age. In addition, even more of the White homeowners are skewed toward ages above 85, which would make them especially prone to exits. Moreover, White homeowners demonstrate a stronger propensity than Hispanic homeowners, even in their 60s and 70s, to exit homeownership in Los Angeles, whether for retirement homes or out-migration.

demand increase for homeownership, as well as the net supply released when groups relinquish their homeownership in a given area. Hispanic homeowners may have roles in the process that are different from White homeowners. Observation for the United States as a whole provides a benchmark picture of the changes by race and age that are net of any internal migration or localized home building.

This longitudinal perspective on homeownership attainment in recession/expansion context can be extended downward to Los Angeles County and then to the newly popular gentrifying subarea 5 miles north of the Los Angeles downtown, the Highland Park/Eagle Rock district, where multiple groups are competing for housing. Our display is arranged in six plots, following Tufte's (1983) principle of "small multiples," showing estimates for cohorts traversing each age group, first in the recession and then the recovery period, and at successively lower levels of geography (exhibit 6). Within each plot, we show estimates of net homeownership gains or losses accrued in each age group by Hispanic and White households and all other racial groups combined, employing the stacked bar technique. A "total" bar then sums the changes for all races of all ages in the recession or recovery period of the given geography.

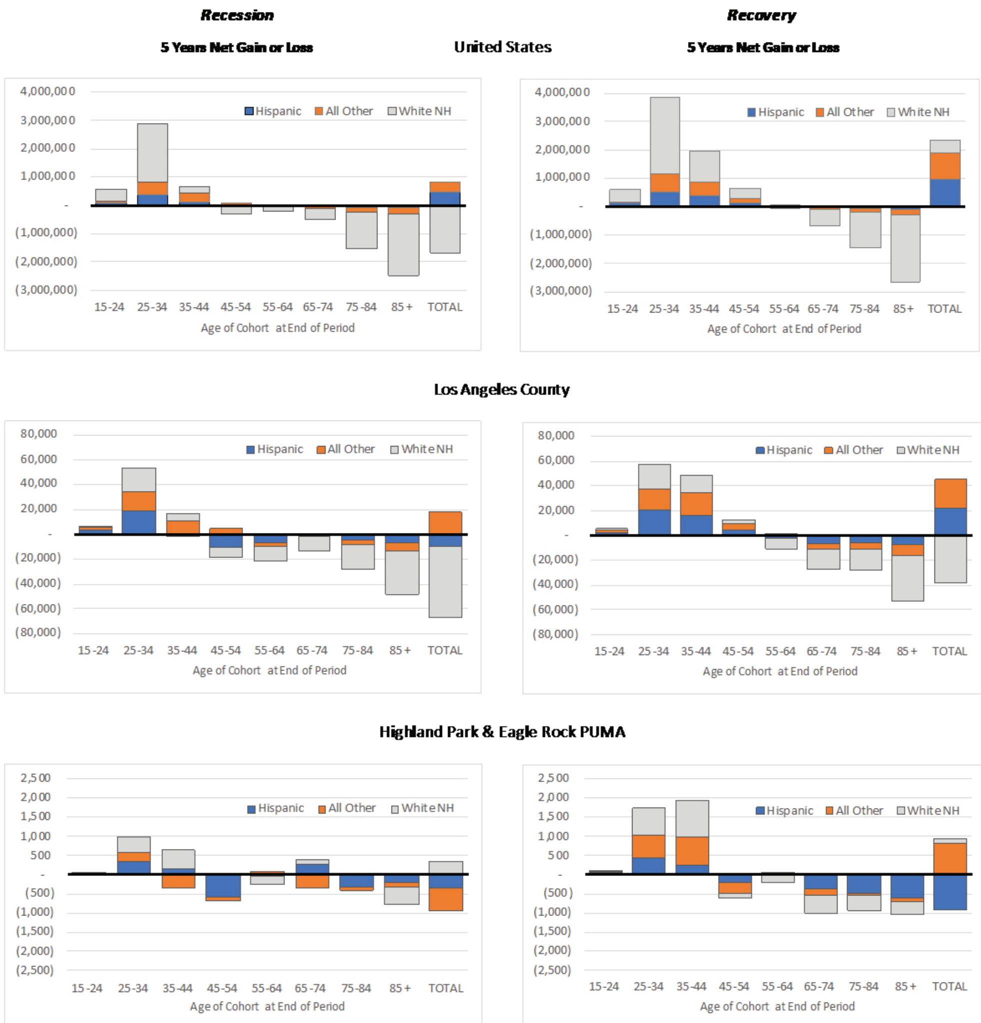
United States Losses and Gains in Homeownership

Changes in homeownership in the United States (top panel) provide a useful backdrop for comparing changes in subregions of the nation. The "total bar" of changes in the recession period indicates more losses than gains, but a net loss of 1.68 million homeowners is registered among White households (exhibit 6). In contrast, the number of homeowners increased among Hispanics by 456,000 during the recession period and, then during the recovery period, increased by nearly a full million homeowners. The combined growth of Asian, Black, and all other homeowners nearly matched the growth of 1-million by Hispanic owners during the recovery period, expanding from 390,000 during the recession. The number of White homeowners also increased during the recovery period, but only half as much as the other groups (444,000).

It might seem surprising that White homeowners would sustain greater exits from homeownership in the recession than Hispanics or others. The explanation is found in the age detail of homeownership change, revealing some major cross-currents of buying and selling by Hispanics and members of different races of different ages. Previously, in exhibit 5, we reviewed the cohort advancement changes of gain or steep decline. Exhibit 6 quantifies the net changes, showing the apportionment by Hispanic, White, and all other racial groups. Most dramatic is how the number of White homeowners plunges downward after age 75. While all the ages over 75 yielded large losses, one age group, 25–34, still exhibits substantial gains in the recession. Nearly 2 million White buyers (net of departures from homeownership) were added during the recession period to the group aged 25–34. This age also included nearly 400,000 Hispanic buyers (net of any Hispanic sellers who did not repurchase). Changes were fairly minor in all other ages except elderly years. Beginning at age 75, more than 3 million White households phased out of homeownership in 5 years' time, also accompanied by losses of about 400,000 aging African American and Asian homeowners.

Exhibit 6

Net Entrants and Departures from Homeownership in the Recession and Recovery Years: Estimated by Age Cohort Among Hispanic, White and Total Households, United States, Los Angeles, and Highland Park/Eagle Rock



NH = non-Hispanic. PUMA = Public Use Microdata Area.

Notes: Data are drawn from the 5-year American Community Survey IPUMS, as labeled by the last year in their collection period: 2009 (2005–2009), 2014* (2010–2014), and 2019* (2015–2019). The recession period is reflected by the change between 2005–2009 and 2010–2014, while the recovery period is between 2010–2014 and 2015–2019. Gains or losses of homeownership are recorded when age cohorts advance 5 years older between these periods.*

Source: 5-year American Community Survey IPUMS

What is striking is how similar are the losses of older homeowners in different periods, as found previously for the 1990s, 2000s, and 2010s (Simmons and Myers, 2018). Here we find a consistency of losses among elderly homeowners even in recession and boom. Instead, the greatest difference in the recovery period is concentrated among young people, no matter the race. Gains in those young age brackets have contributed to the total gain in Hispanic homeowners and other races, leading to a substantial total increase during the post-recession recovery. Combined with the massive loss of older White owners, the large gains in White owners at young ages yield a much smaller total increase in homeowners than Hispanic homeowners alone.

Los Angeles County Losses and Gains in Homeownership

Against this backdrop of national change, we can better assess the case of Los Angeles County, an extremely large (10 million population) and diverse urban area with very high prices and low homeownership rates, as introduced previously. Losses of older White homeowners occurred much as in the nation, but in Los Angeles, they are joined by losses of long-established, aging Hispanic homeowners, as well as elderly owners who are Black or Asian (exhibit 6). However, at younger ages, diversity is even greater. The growth in homeownership is more evenly divided among Hispanic, White, and other (largely Asian) groups. During the recession period, unlike in the nation, Hispanic homeowners declined in total. That overall loss can be attributed to sizable losses for cohorts arriving in ages 45–54 and 55–64, which were even greater for Hispanic homeowners than the losses in elderly years.

In the recovery years, total Hispanic homeowners increased because losses stemmed in middle age (especially ages 45–54) and because a new accumulation of homeownership was achieved at ages 35–44, extending the earlier growth at ages 25–34. Comparing the age rates of homeownership shown earlier for Los Angeles County (exhibit 4), we see that homeownership rates have not rebounded to the high level observed in 2005–2009; instead, they have continued to slip slowly downward among both Hispanic and White households. What enables homeownership acquisition to grow, despite the declining age rates, is that cohorts move up to the next older age group where the average probability of owning is higher. The falling rates in the recession were so great that cohorts moved sideways or downward in homeownership rate for a few years. In reality, the "rate" is a statistical abstraction. People do not move down in rate; they sell more homes in their cohort than they buy. It is the net losses in homeownership (while sustaining renting) that nudge the rate lower than it would have been.

Los Angeles is a long-established immigrant gateway, but it has become less of a magnet for new Hispanic immigrants in recent years. This follows a national pattern in the last decades of the 20th century, when changes to city structures and regional economies began to drive immigrant suburbanization. Currently, the fastest growth is occurring in "secondary" Hispanic metros and metros with historically small Hispanic populations (Sanchez-Moyano, 2020). Longer established Hispanic residents are also gravitating outward, both following the suburbanization of jobs and seeking larger housing units at reasonable prices (Alba and Logan, 1991; Hardwick, 2008; Sanchez-Moyano, 2020). And yet, increasingly, new immigrants are bypassing central cities and settling directly in the suburbs. Painter and Yu (2014) observe also that immigrant Latinos are more resistant to loss of homeownership in recession periods than U.S.-born households, likely due to immigrant networks and also the upward mobility of established immigrants, as highlighted by Myers and Lee (1998).

These dynamics apply In Los Angeles, which we can view through changes in the Highland Park vicinity that has been an ethnic enclave with a majority Hispanic population. Our research discussed next shows that the traditional pattern is not taking place in Highland Park. Hispanic homeowners continue to hold onto older housing stock in the region, and in some cases move to suburban areas in neighboring counties such as San Bernardino and Riverside counties. However, data indicate that newly arrived immigrants are no longer replacing them, and households of other racial designations are instead succeeding them in key life-cycle stages.

The Highland Park/Eagle Rock District and its Homeownership Changes

Our local study area is set within the overall housing market context of Los Angeles, occupying a northeastern district of Los Angeles city known as the Highland Park/Eagle Rock area. One might assume that the trends in this local area would parallel those for racial groups in the county as a whole. However, the unique location and history of the Highland Park/Eagle Rock area, with its very small, combined size (about 2 percent of Los Angeles County population), creates the potential for substantial divergence. The dynamics of gentrification in this area might also create a very different pattern of changing homeownership, but we can track changes separately for each major racial group by using the 5-year ACS files. In particular, it is unknown how those dynamics might differ between the recession and recovery periods. We begin here with a comparison of available microdata for the PUMA (Public Use Microdata Area) that covers the district of Highland Park, Eagle Rock, and vicinity. The next section investigates changes within separate neighborhoods described at the census tract level for the same periods.

Here we examine trends in buying and selling for the district as a whole (exhibit 6, lower panel). Looking first at the total bar in the recession period, White homeowners increased in number, while Hispanic and other races declined. This White trend is sharply different from the decline recorded for Los Angeles County as a whole in the recession. The Hispanic downturn, however, closely mirrors that of the county, while that for all other races (84 percent of whom are Asian, predominantly Filipino in this area) shows a steep downturn in this district, counter to the gain in the county. In the recovery period, the Hispanic decline in homeownership intensifies, while the other race group enjoys a very large gain summed across all age groups (with a virtually negligible increase among Whites).

Net changes by age group again can yield insights into the dynamics underlying these total changes in homeownership. As in LA County, people age 45–54 suffered the most notable loss of Hispanic homeowners during the recession downturn, whereas the sizable loss among the “all other” group is accumulated across many ages. In the recovery years, Hispanic homeowners deepen their decline across the elderly age groups, joined by Whites. However, Hispanic homeowners quell the deep loss at age 45–54, just as in the county as a whole, and add small increases under age 45, but with roughly one-half the proportional prominence of Hispanic gains in Los Angeles County. The truly dramatic new picture in the recovery years is a strong increase in buyers under age 45, roughly split between White and other (largely Asian) homeowners.

Contrary to Los Angeles as a whole, or the nation, Hispanic homeowners are slowly phasing out of the Highland Park area, led by the elderly departures, and with very little replacement by young

Hispanic homebuyers. Instead, there is a surge of young White and Asian homeowners that mark a generational transition in the area.

Neighborhood Changes in the Highland Park/Eagle Rock Area

These foregoing changes in demand may or may not be evenly spread or clustered in neighborhood pockets. At the neighborhood level, housing choices become the primary locational attraction. In the diversity of Los Angeles, households of many different races and ancestries are often competing for the same housing opportunities. The extremely high price of housing in Los Angeles, approximately three times the national average, creates an added incentive for middle-income home seekers to explore opportunities in lower-income neighborhoods. Larger-sized Hispanic families face particular pressures of meeting larger space needs with middle incomes. One response is to live at higher household density, so-called “overcrowding,” and another is to move into areas that middle-income White households may consider undesirable and overlook because of their growing ethnic mix. However, the extremely high affordability pressures in Los Angeles increasingly push middle-income White households into former ethnic enclaves and neighborhoods of lower-income (Goodman, Seidman, and Zhu, 2020), especially if these neighborhoods contain housing with access or view amenities and if the structures can be easily remodeled. The more centrally located, the better for such a residential choice. By the late 1990s, housing preferences of many young adults, especially with two earners, began to swing toward central city convenience (Myers, 2016).

For all these reasons, the Highland Park/Eagle Rock vicinity has become highly sought after by multiple groups. Because of hilly topography and for historical reasons, this northeast district is composed of several distinct neighborhoods, all of which lie within the city limits of Los Angeles. The two largest subareas are the historic Highland Park core and a somewhat newer, lower-density area known as Eagle Rock, each with about 30,000 residents. Highland Park is at the junction of the two main arteries, York Avenue and Avenue 54, with Figueroa Street being the principal artery to downtown Los Angeles before the Pasadena Freeway. That also was the pathway of the original Route 66 from Chicago to LA, but Highland Park now has a light rail station at its core.

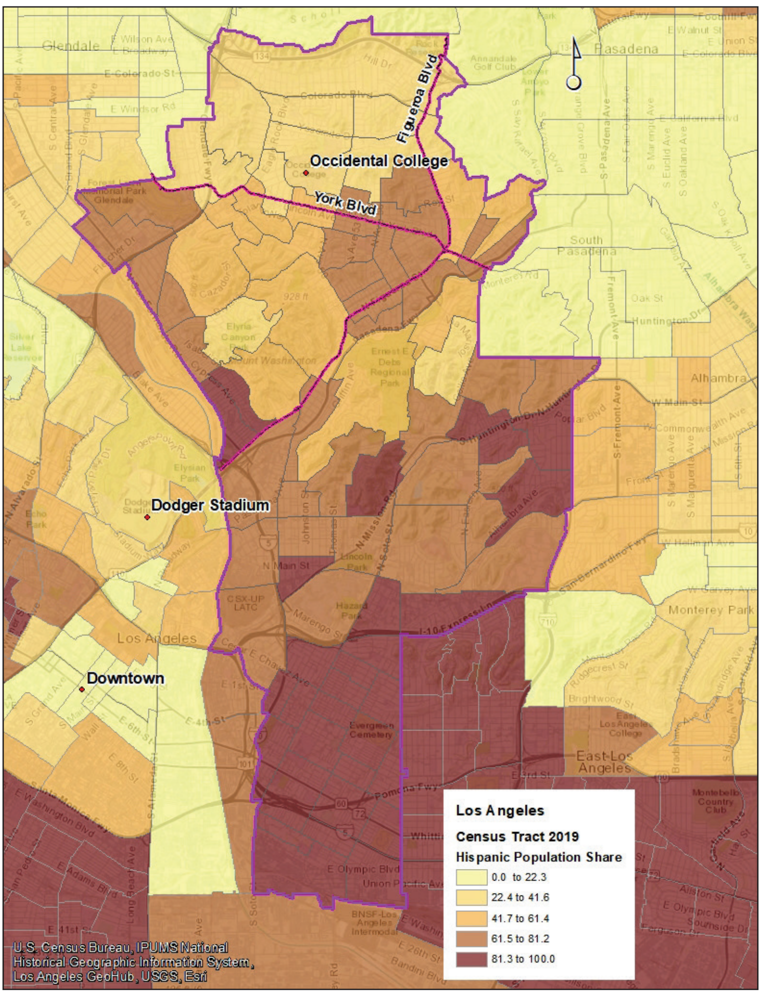
The Eagle Rock section on the northern edge of the study area is lower density and anchored by Occidental College, a small liberal arts college (current undergraduate enrollment 2,081) with a disproportionate impact on the nation. Its two most notable alumni are 44th U.S. President, Barack Obama, and Jack Kemp, the star quarterback who went on to success with the Buffalo Bills in the National Football League, then took his leadership skills to U.S. Congress, serving from 1971–89. Kemp then capped his career serving as the Secretary of the Department of Housing and Urban Development (HUD), 1989–93.

The changing housing fortunes of Hispanics in this diverse community are our principal interest. The district lies at the far northern end of the large “east side” swath of Latino residents bordering downtown Los Angeles and flowing down to suburbs far to the southeast. The map in exhibit 7 highlights the study area lying between 5 and 8 miles north of downtown, just north of Dodger Stadium at Chavez Ravine, a former community of Mexican Americans, and bounded by major freeways running along the Los Angeles River and Arroyo Seco from Pasadena, and two others through the hills.

The growing Hispanic population in the region was situated most densely in areas of lower-cost housing, blocking their access to the west side of LA. In the Highland Park vicinity, opportunities were found in the oldest housing, or pockets in the hills, often low-lying areas like Cypress Park near the railroad tracks along the Los Angeles River on the south side of the study area. However, the largest and most urban settlement was at the core of Highland Park, and that retains among the highest Hispanic population shares (70 percent) in the vicinity today. The lowest Hispanic population concentration is in Eagle Rock (35 percent) on the northern end or on Mount Washington (40 percent), which is elevated between two areas with much higher Hispanic concentration (exhibit 7).

Exhibit 7

Hispanic Population Share of Neighborhoods North and East of Downtown Los Angeles

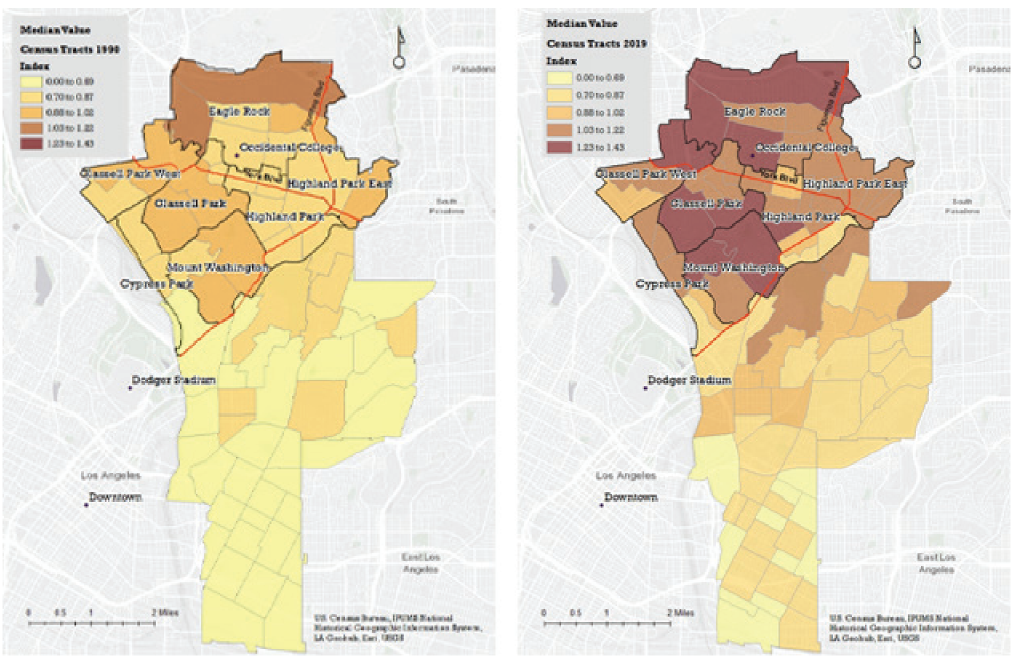


It is not a coincidence, we should note, that there are fewer Hispanic residents on top of Mount Washington or in Eagle Rock. All the in-movers are looking for more affordable housing than they could find elsewhere. The median house value in the Mount Washington subarea is 29 percent higher than the median house value in Los Angeles County, so there is no perceived bargain there unless you might be a housing refugee coming from Silver Lake or the west side of Los Angeles, where prices are far higher. If your comparison is other residential areas to the east and south, Mount Washington is not a good value. Certainly, many Hispanic families do prefer this location for its convenience and amenities. However, its Hispanic share is lower than surrounding areas. Eagle Rock is similar, where the house values are about equal to Mount Washington, and its Hispanic share is also lower.

The comparison of the Highland Park area housing prices to bordering areas of the Latino east side is striking, especially when we compare prices in 1990 to what they have become in 2019 (exhibit 8). Whereas prices to the east of downtown Los Angeles have retained a low value relative to the county-wide median, it is clear that all the neighborhoods in the Highland Park vicinity to the north have moved up in value substantially, with more of them approaching the former high level of Eagle Rock. In contrast, most of the Highland Park vicinity had relatively affordable house values, with some 13 percent below the county median (index value of 1.0). However, by 2015–2019, most of the area was now priced more than 23 percent above the county median.

Exhibit 8

Median House Value in 1990 and 2019 as a Ratio to the Los Angeles County Median, Highland Park Vicinity and the Southern Arc of Neighborhoods Stretching to East Los Angeles

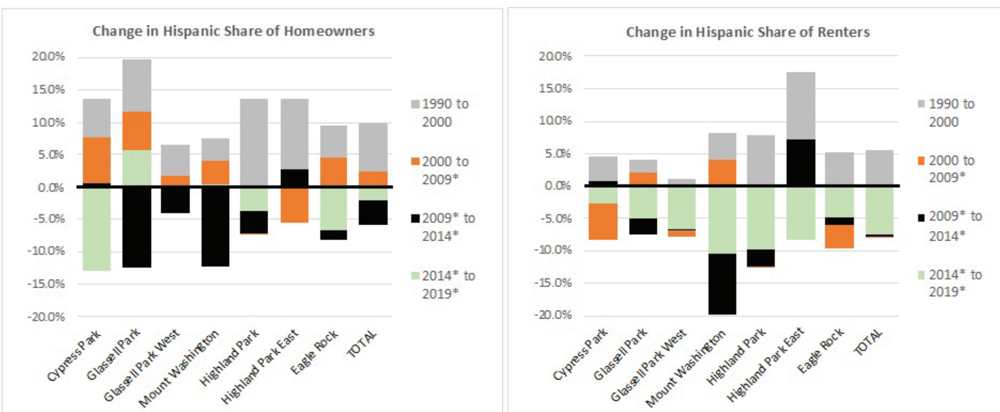


Taking a housing demographic perspective, it is necessary to remember that population groups do not live simply in communities marked in space on a map; rather, the vast majority live in housing units. We should describe what portion of the owner-occupied or rental housing provides shelter for Hispanic households compared to other groups. In the latest data, the overall Hispanic share of households is lower (47 percent) than their share of the population (56 percent), because Hispanic households on average have more persons per household, a difference noted earlier for Hispanics in the United States as a whole (exhibit 1).

How these housing shares that are Hispanic-occupied may have increased or declined during boom and recession is our greatest interest in this study. We calculated the shares separately for the owner-occupied and renter-occupied units, beginning with the changes between 1990 and 2000, then from 2000 to 2009* (during the boom), next from 2009* to 2014* (in the recession), and finally from 2014* to 2019* (in the recovery). These incremental changes in shares accumulate over time but can be reversed as well. The incremental dynamics are represented for every subarea in exhibit 9.

Exhibit 9

Expansion and Reversal of Growth in Hispanic Share of Owned or Rented Housing, by Subareas of the Highland Park/Eagle Rock District (percentage point change in Hispanic share in four periods since 1990)



Note: Data are drawn from the 1990 and 2000 Census and the 5-year American Community Survey summary tables, as labeled by the last year in their collection period: 2009 (2005–2009), 2014* (2010–2014), and 2019* (2015–2019).*

Sources: U.S. Census Bureau; American Community Survey

The "TOTAL" bar for each plot in the exhibit provides an overall summary for the whole area. In the case of homeowners, Hispanic buyers gradually expanded their share of the area's owner-occupied housing, growing by 7 percentage points from 1990 to 2000 and by another 3 percentage points during the heated housing boom (exhibit 9). After that, the Hispanic growth in share reversed itself, falling back 4 percentage points in the recession period (2009* to 2014*), with another 2-percentage point decline during the strong recovery period through 2019*. Most of the specific subareas followed this general pattern, with some declining in recession and others during recovery. Losses of homeownership during the recession would be more expected than during the recovery when the economy was strengthening. Loss during the recession might indicate financial difficulties, possibly even foreclosures. Loss during the economic upswing, in contrast, more likely indicates the Hispanic share was reduced by greater demand from other social groups that sought properties in the area as Los Angeles house prices renewed their upswing after 2014. The housing price changes depicted in exhibit 8 are surely taking their toll on the Hispanic share in the Highland Park/Eagle Rock area.

In general, Hispanics occupy a larger share of the rental units (55.8 percent) than of the owner-occupied units in the district (37.1 percent), according to the latest data. The changes in share since 1990 are more consistent across subareas for the renters, but they also suggest much greater competition by non-Hispanic renters in the recent recovery period. A greater reduction in the Hispanic share of rentals had occurred in all subareas save Cypress Park during the recent recovery period, when the average reduction in rental share exceeded 7 percentage points. The fact that Hispanic rentals were more steeply reduced in the recovery years, without increased Hispanic homeowners, implies that Hispanic renters were displaced elsewhere. The previous analysis by age group (exhibit 6) indicates that an older generation of Hispanic owners was selling off. The new, incoming generation was White or Asian, with only a small number of Hispanic buyers. Those calculations were only about owners, but Millennials from the same groups are likely landing rentals as well, with rising rents pushing out Hispanic residents.

Conclusions

This study has sought deeper information about the growing role of Hispanic households in achieving homeownership and helping to absorb the massive release of owner-occupied homes by millions of Baby Boomer homeowners, mostly White, in their retirement years. Current methods are too static to capture these dynamics of change. To better capture the inflows and outflows from homeownership over time, we have developed a cohort life-cycle advancement model of transitions every 5 years, designing this specifically for application with the three 5-year datasets collected by the Census Bureau through the ACS: 2005–2009, 2010–2014, and 2015–2019. The fortunate timing of these data is that they encapsulate periods of recession and boom in homeownership, with the changes between the first two datasets reflecting the downturn into the recession and its bleak aftermath, while the pairing of the last two datasets captures the upswing into a renewed homeownership boom. This is the first time that cohort longitudinal estimation (Myers, 1999) has been used to trace expansion and contraction of homeownership advancement during recession and recovery and over the full life cycle.

Hispanic households have traveled a different path than White households through these periods. The differences are illuminated by comparing Los Angeles County to the United States pattern because Hispanics are much more prevalent and long-established in Los Angeles, while the White homeowners are less numerous and even older than the national average. These age dynamics in recession and boom elevate our understandings in important ways.

The Hispanic-White homeownership gap is smaller in Los Angeles than in other regions, not only because the Hispanic population is a larger share of the population (Strochak, Young, and McCargo, 2019), or because a larger share of Hispanics is comprised of long-settled generations (Myers and Lee, 1998), or because the price of housing is much higher (Sanchez-Moyano, 2020), but most directly because the White homeownership rate is depressed. High prices affect all groups in a local housing market, but different ages are affected differently. Older households typically made their purchases decades earlier when prices were much lower. As a result, we find an unusually wide age gap in homeownership between ages 30–34 and 70–74 among White households because the young homeownership rate is depressed. However, at the same time, older White homeowners are experiencing a more rapid exodus (commencing at earlier ages) than average for the nation. Thus, the White segment of Los Angeles residents has been losing its highest homeowning members while replacing them with unusually low-homeowning, young households.

The findings from the cohort life-cycle advancement model provide direct insight on these dynamics of change, and these results were compared to findings from a traditional age group analysis that uses the same data but focuses on *changes within age groups* rather than *within cohorts* that are passing from one age group to the next. The two concepts are not interchangeable and deliver highly divergent results (exhibit 5). The cohort advancement method clearly yields estimates that much better summarize the experience and impacts of Millennial or elderly households, for reasons detailed previously. Further, we have demonstrated the opportunity, and necessity, to frame trend analysis as representing changes in housing behavior in 5-year periods subject to radically different recession and boom conditions.

The cohort advancement method's net changes estimated in each age group were displayed for Hispanic, White, and other homeowners, arraying these in hierarchical geographic comparison, from the United States to Los Angeles County, and down to a gentrifying district (exhibit 6). Geographic comparison to the next higher level permits us to see what behaviors may be distinctive during the recession or recovery in the smaller geographic area that is a subset of the whole. Researchers can bring these insights to bear in any local area that is covered by the ACS 5-year datasets. With access to microdata in places of at least 100,000 population, the full cohort life-cycle advancement analysis can be applied. But even in small communities or census tracts, researchers can follow the advancement and retreat of Hispanics, Whites, and other racial groups as a share of the local homeowner or rental sectors (exhibit 9).

Looking ahead, 2020 and 2021 mark the COVID recession, with a strong recovery expected before mid-decade. Lessons derived from tracing cohort advancement in previous recessions and booms surely can provide an underpinning to understanding the "surprising" strength of Millennial housing demand that has been so under-supplied by construction. Higher turnover in the existing stock is urgently needed to create greater generational opportunity. The cohort advancement model can help shed light on the prospects for future turnover, under recession or boom conditions, in neighborhoods with concentrations of older homeowners. As demonstrated here, the cohort approach is far better suited to spotlight the direction and volume of change than traditional age group methods.

Acknowledgments

The authors would like to thank the reviewers and editors for their helpful suggestions. JungHo Park also provided useful advice and assistance with the data. The authors gratefully acknowledge research funding support from the USC Price School of Public Policy and the Randall W. Lewis Foundation.

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References

Cortes, Alvaro, Christopher E. Herbert, Erin Wilson, and Elizabeth Clay. 2006. *Improving Homeownership Opportunities for Hispanic Families: A Review of the Literature*. Washington, DC: U.S. Department of Housing and Urban Development, Office of Policy Development & Research and Abt Associates.

Alba, Richard D., and John R. Logan. 1991. "Variations on Two Themes: Racial and Ethnic Patterns in the Attainment of Suburban Residence," *Demography* 28 (3): 431–453.

Goodman, Laurie, Ellen Seidman, and Jun Zhu. 2020. "To Understand a City's Pace of Gentrification, Look at Its Housing Supply," Urban Wire, Urban Institute. https://www.urban.org/urban-wire/understand-citys-pace-gentrification-look-its-housing-supply.

Hardwick, S.W. 2008. "Toward a Suburban Immigrant Nation." In *Twenty-First Century Gateways: Immigrant Incorporation in Suburban America*, edited by Audrey Singer, Susan W. Hardwick, and Caroline B. Brettell. Washington, DC: Brookings Institution Press: 31–50.

Myers, Dowell. 2016. "Peak Millennials: Three Reinforcing Cycles that Amplify the Rise and Fall of Urban Concentration by Millennials," *Housing Policy Debate* 26 (6): 928–947.

———. 1999. "Cohort Longitudinal Estimation of Housing Careers," *Housing Studies* 14 (4): 473–90.

Myers, Dowell, and Hyojung Lee. 2016. "Cohort Momentum and Future Homeownership: The Outlook to 2050," *Cityscape: A Journal of Policy Development and Research* 18 (March): 131–143.

Myers, Dowell, Hyojung Lee, and Patrick A. Simmons. 2020. "Cohort Insights into Recovery of Millennial Homeownership after the Great Recession," *Journal of Housing Economics* (2020) v. 47. https://doi.org/10.1016/j.jhe.2019.01.004.

Myers, Dowell, and Seong Woo Lee. 1998. "Immigrant Trajectories into Homeownership: A Temporal Analysis of Residential Assimilation," *International Migration Review* 32 (Fall): 593–625.

Myers, Dowell, and JungHo Park. 2020. *End of Housing and Economic Recovery from the Great Recession: How Good Did It Get by 2019?* Special Report, Population Dynamics Research Group, USC Price School of Public Policy. https://cpb-us-e1.wpmucdn.com/sites.usc.edu/dist/6/210/files/2020/10/USC_End_Recovery_Report.pdf.

Myers, Dowell, and SungHo Ryu. 2008. "Aging Baby Boomers and the Generational Housing Bubble: Foresight and Mitigation of an Epic Transition," *Journal of the American Planning Association* 74, 1 (Winter 2008): 17–33.

National Association of Hispanic Real Estate Professionals (NAHREP). 2020. 2019 *State of Hispanic Homeownership Report*.

Painter, Gary, and Zhou Yu. 2014. "Caught in the Housing Bubble: Immigrants' Housing Outcomes in Traditional Gateways and Newly Emerging Destinations," *Urban Studies* 51 (4): 781–809.

Rugh, Jacob S. 2015. "Double Jeopardy: Why Latinos Were Hit Hardest by the U.S. Foreclosure Crisis," *Social Forces* 93 (3): 1139–1184. doi: 10.1093/sf/sou107.

Sanchez-Moyano, Rocio. 2020. "Geography and Hispanic homeownership: a review of the literature," *Journal of Housing and the Built Environment*. http://doi.org/10.1007/s10901-020-09745-5.

Simmons, Patrick, and Dowell Myers. 2018. "The Coming Exodus of Older Homeowners." *Fannie Mae Insights*. Washington, DC: Fannie Mae. http://www.fanniemae.com/resources/file/research/pdf/housing-insights-homeowner-exodus-071118.pdf.

Strochak, Sarah, Caitlin Young, and Alanna McCargo. 2019. "Mapping the Hispanic Homeownership Gap." Urban Wire, Urban Institute. https://www.urban.org/urban-wire/mapping-hispanic-homeownership-gap

Tufte, Edward. 1983. *Visual Display of Quantitative Information*. Cheshire, CT: Graphics Press.

Hogar Dulce Hogar? [Home Sweet Home?]: Prepurchase Counseling and the Experiences of Low-Income Latinx Homeowners in Denver

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Abstract

This study examines the extent to which completion of a prepurchase homeownership education and counseling program was associated with (1) the terms and conditions of original mortgage loans; (2) housing and neighborhood quality; (3) subsequent mortgage refinancing; (4) the sustainability of homeownership; and (5) foreclosures and short sales experienced by low-income Latinx homeowners. The sample consists of 303 Latinx former Denver Housing Authority (DHA) residents who purchased homes from 1995 to 2011; 95 of those residents completed DHA's HomeOwnership Program (HOP). Propensity score matching techniques were employed to create a comparison group from the remaining 208 homeowners who purchased homes without assistance from HOP. Overall, Latinx homeowners in the study purchased their homes with little or no downpayment; however, Latinx HOP homeowners were more likely to hold 30-year fixed-rate mortgages at lower interest rates than were non-HOP homeowners. Latinx HOP homeowners also resided in homes that were larger and had fewer upkeep issues and were in neighborhoods with few vacant homes or properties in disrepair. In addition, Latinx HOP homeowners owned their homes, on average, for 12 years—about 2 years longer than did non-HOP homeowners, and their average home value in 2018 was nearly $322,000—about $58,500 higher than that of non-HOP homeowners. Nonetheless, one of five Latinx homeowners in the study had experienced a foreclosure by 2018. Moreover, the rate of foreclosures and short sales was 25 percentage points higher for non-HOP Latinx homeowners than for HOP homeowners.

Introduction

The passage of the Fair Housing Act of 1968 and its subsequent amendment in 1988 explicitly prohibited discrimination in the sale, rental, and financing of housing on the basis of race, color, religion, national origin, sex, disability, and familial status. These federal housing policies expanded the opportunities available to lower income, minority families, significantly increasing the Latinx homeownership rate from approximately 42 percent in 1970 to nearly 50 percent by the mid-2000s. The economic and housing crises undergirding the Great Recession, however, triggered a nearly 4-percent drop in Latinx[1] homeownership rates between 2007 and 2015. Since 2015, homeownership rates have risen, with 51.4 percent of Latinx households residing in homes they own by 2020 (NAHREP, 2021; NCRC, 2020). Growth in Latinx homeownership is expected to continue and to constitute the main driver of homeownership growth—60 percent of overall growth—in the United States (NAHREP, 2021; NCRC, 2020). Nonetheless, the Latinx-White[2] homeownership gap remains about 26 percentage points (Becketti and Atreya, 2017; Cortes et al., 2007; Sanchez-Moyano, 2020), although this gap varies by region and urban or rural location (Acolin, Lin, and Wachter, 2019; Strochak, Young, and McCargo, 2019).

Contributing to the Latinx-White homeownership gap is the inadequate service provided by traditional financial institutions. In 2019, only 24 percent of mortgages to Latinx homebuyers were from banks, and 70 percent of the home loan originations were financed by mortgage companies charging higher fees and mortgage interest rates (NCRC, 2020). Latinx borrowers also were more likely to be denied a mortgage: 10 percent of mortgage applications from Latinx borrowers were denied in 2019, compared with 6 percent for White borrowers (NCRC, 2020). Latinx homeowners remain at higher risk of experiencing mortgage delinquencies and foreclosures, particularly during times of income shocks and economic downturn, because they are more likely to have fewer financial resources, limited equity in their homes, and higher debt-to-income (DTI) ratios (Dey and Brown, 2020; NAHREP, 2021; Neal, Choi, and Walsh, 2020). Bayer, Ferreira, and Ross (2016) estimated that 10 percent of Latinx homeowners had delinquent mortgages during the Great Recession; others have estimated that one of every five Latinx households had lost or were at imminent risk of losing their homes to foreclosure during that period (see Bocian, Li, and Ernst, 2010; Garriga, Ricketts, and Schlagenhauf, 2017; Reid et al., 2017).

The housing market crash and subsequent tidal wave of foreclosures that disproportionately affected Latinx and other minority households sparked renewed debate about the wisdom surrounding efforts to increase homeownership among lower income households. Of overriding concern is the long-term sustainability of homeownership and how housing burden, subprime and predatory lending, and rising nonhousing indebtedness contribute to the increased risk of foreclosure and housing instability for Latinx homebuyers (Cortes et al., 2007; Kochhar, Gonzalez-Barrera, and Dockterman, 2009; Zhang and Lerman, 2019). In addition to expressing concerns about the wealth-building capacity derived from low-income homeownership (Kochhar, Fry, and Taylor, 2011; Shapiro, 2006), previous studies have challenged the extent to which it has improved the housing and neighborhood quality of Latinx families and reduced the homeownership opportunity

[1] In this paper, whenever possible, we use the gender neutral term *Latinx* to refer to Latino and Latina homebuyers; however, *Latino/a* and *Hispanic* may be used interchangeably.

[2] In this paper, *White* refers to non-Latinx White or Anglo.

gaps between Latinos and Whites (Sanchez-Moyano, 2020; Thomas, Mann, and Meschede, 2018). Others, however, have argued that prepurchase financial counseling and targeted downpayment assistance programs can mitigate those risks and increase the number of Latinx families who are in the financial position to become homeowners (Parrott and Payano, 2016; Santiago, Galster, and Smith, 2017; Strochak, Young, and McCargo, 2019; Turnham and Jefferson, 2012).

In this study, we assess the extent to which participation in a prepurchase homeownership counseling and asset-building program operated by the Denver Housing Authority (DHA) was associated with the following outcomes for Latinx homeowners: (1) the original terms and conditions of mortgage loans; (2) housing and neighborhood quality in destination neighborhoods; (3) subsequent mortgage refinancing of the original home; (4) the sustainability of homeownership; and (5) the experience of foreclosures and short sales. To estimate program impact, those outcomes were assessed over time for a cohort of 303 Latinx former subsidized housing residents who purchased their homes between 1995 and 2010. Only 95 of those residents had graduated from a homebuyer education and counseling program offered by the Housing Authority of the City and County of Denver to its public housing residents and Housing Choice Voucher recipients. This may be the first report to explicitly assess program impacts for Latinx homebuyers not only at the time of home purchase but through the first decade or more of their homeownership experience.

The report begins with a brief review of the homeownership literature that focuses specifically on Latinx knowledge of and access to the homebuying process, including several excellent reviews of the broader literature on Latinx and minority homeownership (see, for example, Cortes et al., 2007; Herbert and Belsky, 2008; Sanchez-Moyano, 2020). Next is a review of evaluations of homebuyer education and counseling programs, with an emphasis on outcomes for Latinx participants. The next section describes the DHA's HomeOwnership Program (HOP) and participants, followed by a description of the analytical strategy and statistical methods employed for assessing HOP program impacts. The following section reports the findings related to original mortgage terms and conditions, housing and neighborhood quality, refinancing and loan modifications, sustainability of homeownership, and foreclosures and short sales. The article concludes with a discussion of the policy implications derived from those findings, focusing on how homebuyer education and counseling programs could be used to promote and sustain Latinx homeownership.

Latinx Knowledge of and Access to the Homebuying Process

Before the Fair Housing Act of 1968, de jure discriminatory practices operating at the federal, state, and local levels severely limited Latinx access to housing and homeownership in nonminority neighborhoods (Martinez and Aja, 2020; Wachter and Megbolugbe, 1992). Redlining and the inability to obtain Federal Housing Administration mortgage financing further constrained the ability of Latinx and other minority residents to purchase homes in minority neighborhoods (Rothstein, 2017). The lingering effects of decades of structural barriers to homeownership—coupled with disparities in wealth, income, and savings, as well as lower credit scores, contribute to ongoing patterns of significantly lower homeownership rates for Latinx households compared to their White counterparts (Acolin, Goodman, and Wachter, 2019;

Becketti and Atreya, 2017; Gyourko, Linneman, and Wachter, 1999; Hyde and Fischer, 2021; Neal, Choi, and Walsh, 2020). Precipitous declines in Latinx homeownership with the collapse of the housing and mortgage markets between 2007 and 2015 were followed by more recent upticks in home purchases, bringing current Latinx homeownership rates to levels slightly above their peak in the mid-2000s (Acolin, Lin, and Wachter, 2019; NCRC, 2020). Indeed, 60 percent of the current net growth in homeownership in the United States is driven by Latinx homebuyers (NAHREP, 2021; NCRC, 2020).

Coupled with concerns about economic constraints limiting Latinx access to homeownership are ongoing apprehensions about the limited knowledge that prospective Latinx buyers have about the homebuying process (Cortes et al., 2006). In their examination of efforts to improve homeownership opportunities for Latinx households, Cortes and colleagues (2006) found that the most common barriers to homeownership were the lack of familiarity with the homebuying process (see also Cortes et al., 2007; Fannie Mae, 2003), which is accentuated for Latinx buyers with limited English proficiency. Lack of a credit history, a thin credit history, or poor credit are often combined with an inadequate understanding of what constitutes creditworthiness, minimal financial literacy skills, and limited interaction with and a general distrust of U.S. financial institutions (Ibarra, 2005; UnidosUS, 2019). The distrust of financial institutions has been exacerbated by the lack of outreach from those institutions to Latinx communities and the limited investment they make in hiring bilingual and bicultural financial professionals (Bowdler, 2005).

Further eroding trust in the homebuying process is the evidence suggesting ongoing differential and more favorable treatment received by White homebuyers relative to Latinx homebuyers from various actors in the process (see review by Quillian, Lee, and Honoré, 2020). In their recent meta-analysis of housing and mortgage discrimination studies, Quillian, Lee, and Honoré (2020) found that compared with White homebuyers, Latinx homebuyers were shown fewer residential options, were more likely to be denied mortgages, and, if offered mortgages, were more likely to receive high-cost mortgages. Indeed, pervasive mortgage lending discrimination during the 1990s and 2000s led to the disproportionate receipt of subprime, interest-only, balloon, jumbo, or other risky loan products for Latinx homebuyers (Bowdler, 2009; Garriga, Ricketts, and Schlagenhauf, 2017; Immergluck, Earl, and Powell, 2019) even when they were qualified for better loans (UnidosUS, 2019; Wilberg Ricks, 2009a). Howell and Korver-Glenn (2018) underscore how various actors (e.g., home appraisers, inspectors) in the homebuying process have colluded to expose prospective Latinx homebuyers to predatory financing.

Homebuyer Education and Counseling Programs—Do They Make a Difference for Latinx Homebuyers?

Completion of prepurchase homebuyer education and counseling is considered foundational to the viability and long-term sustainability of homeownership in low-income and minority communities. These programs provide prospective homebuyers with the requisite skills regarding budgeting and credit, knowledge about mortgages and the mortgage process, and access to sustainable mortgage credit (Argento et al., 2019). The decades-long interest in the effectiveness of these programs has produced an extensive and diverse literature centered primarily on the attainment of homeownership and short-term, postpurchase mortgage repayment behaviors (see reviews by Collins and O'Rourke, 2011; Mayer and Temkin, 2016; Myhre and Watson, 2017; Quercia and Wachter, 1996). With the collapse of the U.S. housing market in 2007 and 2008, attention shifted to assessing the impact of postpurchase counseling, particularly its role in foreclosure prevention and the sustainability of homeownership (Agarwal et al., 2010; Avila, Nguyen, and Zorn, 2013; Ding, Quercia, and Ratcliffe, 2008).

Despite their popularity, the short- and long-term effectiveness and impact of homebuyer education and counseling programs still remain unclear. Moreover, little is known about their effectiveness in improving the homeownership outcomes of Latinx buyers. Previous studies suggest that homeowners who completed homebuyer education and counseling experienced significantly lower rates of mortgage defaults and foreclosures relative to similar homeowners who did not receive such education or counseling (Agarwal et al., 2010; Avila, Nguyen and Zorn, 2013; Hirad and Zorn, 2002; Mayer and Temkin, 2016; Temkin et al., 2014). Other studies, however, found no effect of these programs on the timeliness of mortgage payments or foreclosure prevention (Jefferson et al., 2012; Peck et al., 2019; Smith, Hochberg, and Greene, 2017). Moreover, previous studies have focused primarily on examining aggregate impacts (participants vs. nonparticipants) or various delivery methods (in-person vs. online). To date, only a few studies have explicitly examined racial or ethnic differences in the impact of homebuyer education and counseling on homeownership outcomes.

Since the early 2000s, a series of policy briefs and testimonies at federal hearings have touted the benefits of prepurchase homebuyer education, particularly one-on-one counseling, for prospective Latinx buyers (see Bowdler, 2009; Diaz, 2004; Flores, 2014; Garza, 2020; Hizel, Kamasaki, and Schafer, 2002; Ibarra, 2005; UnidosUS, 2018, 2019; and Wilberg Ricks, 2009b). Rigorous evaluations of program impacts for Latinx homebuyers are limited, however. An early evaluation of the Home to Own program piloted in Arizona reported that participants who completed the prepurchase counseling component of the program had significantly lower delinquencies and foreclosures (Johnson and Macias, 1995, as cited in Hizel, Kamasaki, and Schafer, 2002). Santiago and colleagues (2010) found that low-income Latinx buyers who participated in a homeownership education and counseling program in Denver reported significant improvements in neighborhood quality, including newer housing stock and lower crime rates. They also were more likely to rate their destination neighborhood as good as or somewhat better relative to their prepurchase neighborhood. An evaluation of Denver's enhanced Family Self-Sufficiency program, serving primarily Latinx and African-American subsidized housing residents, found that 30 percent of high-intensity participants purchased their own homes within 5 years of starting the program, compared with 2 percent of low- to moderate-intensity participants (Santiago, Galster, and Smith, 2017). Early results from the *First-Time Homebuyer Education and Counseling Demonstration* (Peck et al., 2019) suggest that Hispanic participants in the demonstration were less likely to purchase a home than were White participants. Further, Peck and colleagues found no effect of homebuyer education and counseling on rates of home purchase by Hispanic participants.

To address those gaps in the literature, this study assesses the impacts of a face-to-face homebuyer education and counseling program in Denver that serves low-income subsidized housing residents, the majority of whom are of Latino origin. Specifically, the study examines whether participation in and completion of the DHA's HOP yields superior outcomes for first-time Latinx homebuyers at the time of home purchase and through a decade or more of homeownership.

Denver's Homeownership Counseling Program

The Denver Housing Authority initiated HOP in late 1994. From its inception until the onset of the Great Recession, HOP's homebuyer education and counseling was open only to DHA public housing residents and Housing Choice Voucher recipients. Since 2007, however, DHA has been a HUD-approved homeownership counseling agency, providing the required Colorado Housing Finance Authority 1-day classes to hundreds of other first-time homebuyers residing throughout metro Denver (DHA First-Time Homebuyer Education, n.d.). DHA does not offer the extended program available to subsidized housing residents through HOP to the general public, however. Between 1995 and 2020, HOP provided homeownership education and counseling to nearly 2,100 subsidized housing residents, the majority (55 percent) of them of Latinx origin.[3] To date, 220 subsidized housing residents have graduated and purchased homes through HOP. Although the majority of HOP participants did not purchase homes, they often realized other financial capability milestones, such as increased employment and earnings, credit repair, or debt reduction.

Involvement in HOP includes two phases of program treatment. The initial phase of HOP is geared toward financial capability—increasing employment and earnings, savings accumulation, debt reduction, and credit repair. At the time of HOP enrollment, 52 percent of participants have earnings below $10,000, and nearly one-third (31 percent) have no earnings at all (Santiago and Galster, 2008). Relatively few start the program with any personal savings, and more than one-half have derogatory debt. In collaboration with HOP case management staff, participants develop Individual Training and Services Plans that assist them to become “mortgage loan ready” (DHA Homeownership, n.d.: para. 1). During the program, HOP participants are eligible for money management counseling that emphasizes budgeting, debt reduction, and savings goals. The program also offers credit management support that includes free credit reports, credit counseling, and assistance with credit repair. To encourage savings for future asset purchases—such as education and training, microenterprise, and homeownership—DHA also offers Matched Savings Accounts for DHA public housing residents enrolled in the program. Deposits into those accounts are matched at a rate of 1:1 up to a maximum participant contribution of $1,500. In addition, DHA offers Incentive Plus classes on a wide range of financial capability topics (e.g., real estate, self-sufficiency, employment). Participants receive $20 coupons for every class attended, which can be applied to cover closing costs; however, the DHA matches and coupons are disbursed only to participants who successfully complete the program and go on to purchase a home under the auspices of HOP. For eligible participants who are simultaneously enrolled in the Family Self-Sufficiency (FSS) Program, HOP uses the rent escrow account feature of FSS to foster the accumulation of savings. Rent escrow savings are distributed only to participants meeting the FSS program requirements for employment, earnings, and being Temporary Assistance to Needy Families (TANF)-free as well as completion of all participant-identified Contract of Participation

[3] Subsidized housing residents in DHA are diverse. Approximately 55 percent of all HOP program participants are Latino, 24 percent African-American, 10 percent Vietnamese, and 10 percent Anglo.

and Individual Training and Services Plan goals (see Santiago and Leroux [2021] for a full description of the FSS program and requirements).

When HOP counselors identify participants who are within a year of being able to purchase their own home, they are invited to join the Home Buyers Club.[4] Over the course of a year, the Home Buyers Club offers monthly classes covering topics such as real estate terms, mortgage financing, engaging with real estate agents and loan officers, the home purchase process, and work with contractors (DHA, Homeownership, n.d.). In addition, HOP offers special benefits, such as reduced interest rate mortgage products, mortgage fee discounts, downpayment and closing cost assistance, and, when necessary, second mortgage assistance. Integrated into the homeownership counseling sessions are discussions about fair housing, fair lending, and what constitutes a sound home purchase. During this second phase of the HOP program, participants are expected to attend 9 of the 12 monthly classes; complete an intensive, 1-day homeownership seminar offered by the Colorado Housing Finance Authority (CHFA); and pass the CHFA homeownership exam. As participants move closer to home purchase, they meet regularly (often weekly or biweekly) with their case manager and other HOP program staff members.

Data and Methods

Data

This mixed-methods study uses data from the *Denver Housing Study*, a longitudinal evaluation of HOP operated by the Denver Housing Authority (for additional details about the study and data, see Galster et al., 2019, and Santiago, Galster, and Smith, 2017). The analysis sample used in this study consists of 303 Latino former DHA residents who purchased homes from 1995 through 2011; 95 of them had participated in HOP. The remaining 208 homeowners were DHA residents who purchased homes without assistance from HOP and serve as a comparison group.

Data used in the study include DHA administrative data and quantitative and qualitative data gathered from both prospective and retrospective survey interviews with homeowners who participated in the *Denver Housing Study*. DHA administrative data provided baseline information about the participants in the study and detailed information about their participation in the HOP and FSS programs, as applicable. A series of prospective surveys were conducted with HOP participants beginning in 2001 (the start of the study) and as they moved through the various phases of the program until they purchased their homes. Additional retrospective surveys were completed between 2008 and 2011 with early (pre-2001) HOP graduate homeowners and the sample of non-HOP homeowners. The homeowner survey, a 90-minute in-person or telephone survey, included a battery of questions about home financing at the time of purchase and subsequent refinancing, which are used in conjunction with county administrative data.

County property records, including data on mortgage liens, refinancing, and real estate transaction data, including sales and foreclosures for the period between the original home purchase and

[4] Requirements for entry into the Home Buyers Club include being employed with the current employer for at least 1 year (or have another stable source of mortgage repayments) and having personal savings of at least $500. To date, approximately 400 HOP participants have reached this level of the program.

2018, were examined first in-person using microfilm copies available at the Real Property offices in the Denver metropolitan area (primarily Adams, Arapahoe, Denver, Douglas, and Jefferson counties) and then online as those records became available in digitized formats. Office of Tax Assessor records from the date of purchase through 2018 also were reviewed to secure information on appraised home valuations and property tax assessments.

In-person, systematic social observations of the block faces that represent the immediate neighborhood environs where Latinx owners in the study resided were conducted in 2010 through 2011 after several years of homeownership. Those neighborhoods were defined as the block face where an identified study property was located and the block face across the street from the home. The typical block-face neighborhood in Denver comprised 20 properties. For the analyses reported in this study, the sample was restricted to the 202 block faces in the metropolitan Denver area that were owned and occupied by study homeowners at the time of the observations.[5]

Study team members were trained to conduct systematic social observations in the field following the techniques described by Sampson and Raudenbush (1999, 2004). Observer teams walked or drove down every street within the sample of block faces at some point every day between the hours of 9:00 a.m. and 7:00 p.m. Although observer teams were aware of the location of the study property and captured that information on the observation log (e.g., property #7 on the block), they did not know whether those homes were owned by HOP or non-HOP Latinx buyers (copies of those observation logs may be found in appendix A).

Observer teams collected information on five domains of the residential physical environment: land use, dwelling conditions, parcel conditions, infrastructure conditions, and environmental conditions. *Land use* was defined by nine items from the observer logs indicating the percentage of the block face that was used as (1) operating residential property, including vacant units ready for occupancy; (2) abandoned residential properties; (3) operating commercial or retail buildings; (4) operating industrial, construction, or transportation buildings; (5) operating institutional buildings; (6) closed or abandoned nonresidential buildings of all types; (7) transportation rights-of-way, including major roads, freeways, highways, and railroads; (8) parks, playgrounds, recreational facilities, green space, and watercourses; and (9) other land uses not listed.

Dwelling conditions were defined by six items rating the physical conditions of properties located on the observed block faces. The conditions measured included (1) abandoned residential or commercial property; (2) facade or steps broken, missing, or needing repairs; (3) walls with holes, peeling, or needing repairs; (4) roofs or gutters with holes, patched, or needing repairs; (5) windows broken, patched, or needing repairs; and (6) security bars on windows or doors.

Parcel conditions referred to the physical conditions of the parcels of land in the block face, including the presence of (1) large items of trash; (2) litter; (3) broken glass; (4) abandoned or disabled cars; (5) garbage; (6) graffiti; and (7) weeds or lawns that need mowing.

[5] Followup interviews and systematic social observations scheduled to be conducted during 2020 were postponed because of the COVID-19 pandemic.

Infrastructure conditions consisted of the physical condition of streets and alleys and the presence of sidewalks in the observed block face. Street conditions were measured using a rating scale incorporating the following options: (1) large holes capable of causing auto damage; (2) minor holes, bumps, or cracks in street; (3) smooth street paving; (4) street under construction or resurfacing; and (5) street not paved. The condition of alleys was measured using a rating scale consisting of the following: (1) sufficient trash, junk, or other debris to impede traffic; (2) visible trash, junk, or other debris, but not enough to impede traffic; (3) no visible trash, junk, or other debris; and (4) no alleys in the block face.

Environmental quality conditions referred to the existence of air quality or noise-related problems. They were measured using questions about the existence of noticeable odors (with type detailed) and any types of noise (traffic, industrial, rail transit, loud music, or other) that may have been detected by the observer while at the block face.

During the systematic observations, information on security features and human activities observed on the block face was also collected. *Security features* included items such as a single or gated entrance into the neighborhood and the presence of police or security guards. *Human activities* were assessed by a series of questions regarding the presence and actions of children, teens, and adults in a block face. Those observations included seeing any teenagers or adults congregating in groups, individuals who were loitering, individuals who were homeless, or individuals engaged in extralegal activities. Observers were also asked whether they heard any language spoken other than English.

Finally, longitudinal neighborhood data were compiled at the census tract level for the period between home purchase and 2018 and were derived from the U.S. Census and the *American Community Surveys*. In the period between the 1990 and 2010 censuses, the *Neighborhood Change Database* from GeoLytics was employed because it adjusted the data to account for changes in tract boundaries between the decennial censuses. Estimates of non-census year neighborhood indicators used the strategy employed by Santiago and colleagues (2014) of linear interpolation for the period between 1990 and 2010.[6] From 2009/10 to 2018, data from the *American Community Survey* were used. Principal components analysis was conducted to reduce the total number of neighborhood conditions to the 10 census tract-level indicators included in these analyses: percentages of African-American, foreign-born, and female-headed households; poverty and unemployment rates; neighborhood occupational prestige; percentage of renters; percentage of individuals age 5 and older who moved within the 12 months of the study period; vacancy rates; and percentage of housing units built before 1940.

Additional details about specific outcome measures are provided in the Results section of this report.

[6] The authors believe that the use of linear interpolation is less erroneous than using the same values (e.g., either the 1990 or 2000 census tract estimates) for an entire census decade when change in those neighborhood conditions over time is reasonable to expect. Linear interpolation provides a means of estimating change in neighborhood characteristics between the two census anchor years (e.g., between 1990 and 2000; between 2000 and 2010). If the rate of change is steady, then the linear interpolation is specified correctly. Estimates are incorrect only if the rate of change is not constant throughout the decade. Unfortunately, the available data do not provide information that indicates whether the rate of neighborhood change is accelerating or decelerating. Although interpolation is subject to random measurement error, the size of the error is clearly smaller than it would have been if either 1990 or 2000 census indicators of neighborhood conditions had been used for the entire period captured in the study. In addition, because interpolation is subject to random measurement error (hence producing inflated standard errors), the coefficients are more likely to be statistically insignificant; thus, if significant neighborhood effects exist, the size of the effects would be biased downward.

Analytic Approach

Propensity score analysis using one-to-one nearest-neighbor matching techniques was employed to match Latinx HOP homeowners and non-HOP homeowners on a common set of program characteristics (DHA housing program assignment and duration in program) and participant characteristics (age, gender, educational attainment, immigrant status, marital status, family size, and earnings at the time of home purchase). The characteristics of Latinx HOP-graduate homeowners and non-HOP homeowners before matching are summarized in exhibit 1. Those data suggest that Latinx HOP homeowners are more likely to be male, older, and U.S.-born, with higher levels of educational attainment and higher incomes at the time of purchase than non-HOP homebuyers. In addition, Latinx HOP homebuyers were less likely to reside in conventional, DHA subsidized housing, and their housing tenures in DHA were shorter than those of non-HOP homebuyers. The observed differences between the two groups of Latinx homebuyers underscore the need for propensity score matching to estimate program impacts.

Exhibit 1

Characteristics of Latinx Homeowners at Time of Purchase, by HOP Program Status, Before Matching

Characteristic	Non-HOP homeowner	HOP homeowner
Number of DHA residents	211	95
Female (%)	76.8	91.6
Immigrant (%)	48.3	21.1
Age category		
Less than 24 years old (%)	7.6	2.1
24-33 years old (%)	26.5	31.6
34-43 years old (%)	39.8	44.2
44 year old or older (%)	26.1	22.1
Attained schooling beyond high school (%)	2.4	9.5
Average yearly income ($)	24,180	36,926
Single parent (%)	65.4	58.9
Family size		
1 (%)	1.4	3.2
2 (%)	16.1	14.7
3 (%)	25.1	22.1
4 (%)	24.2	25.3
5 (%)	18.5	24.2
6 or more (%)	14.7	10.5
Spent 5 years or more in DHA housing (%)	44.5	21.1
Housing in DHA development (%)	40.3	28.4
Purchased home prior to 2006 - start of Great Recession in Denver (%)	87.2	79.0

DHA = Denver Housing Authority. HOP = HomeOwnership Program.

Sources: Data compiled by authors from unpublished administrative data from the Denver Housing Authority; Denver Housing Study Baseline surveys

The impact parameter used in these analyses is the average treatment effect on the treated (ATET), which is estimated using a difference in means across matched samples. The goal is to estimate the average treatment effect of participating in and graduating from the HOP program. Because participation in the program is voluntary and participants have to meet certain milestones along the way to remain eligible, selection bias is a possibility: actual participants in the program might be individuals or households who, in particular, stood to gain from participating in the program, whereas those who did not participate might be individuals who believed the program would not offer much benefit.

For a given individual i and outcome Y, the label Y_i (1) is the value of the outcome for that individual if he or she enrolled in and completed the HOP program, and Y_i (0) is the value of that outcome if not. Only one of those two potential outcomes can be observed for each individual, so the missing outcome has to be estimated using propensity score matching. The following logit regression is estimated using maximum likelihood:

$$\Pr[HOP_i = 1|\boldsymbol{x}_i] = f(\beta\boldsymbol{x}_\mathrm{i}) + \eta_i$$

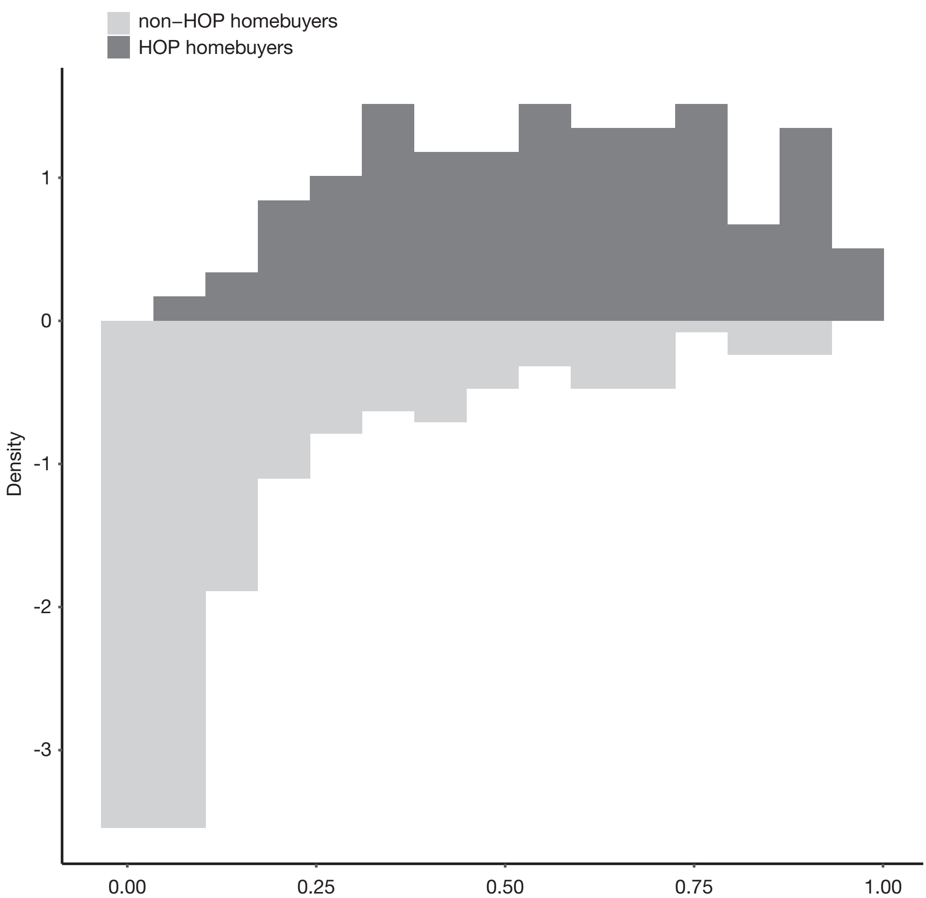
Where HOP_i is an indicator taking on the value 1 if a given individual enrolls in and completes the HOP program, and $\boldsymbol{x}_i$ is a vector of observable characteristics for each household that help predict whether a given individual participates in the HOP program or not. In particular, the observable characteristics used are demographic, economic, and housing indicators measured before home purchase, many of them discretized to facilitate matching. Those indicators include measures for individual educational attainment beyond high school, the natural log of household income, and a set of demographic indicators for gender, age 40 or older, immigrant status, single parent status, and family size of four or more. DHA program measures include duration of residence in DHA housing greater than 6 years (indicating above-average duration) and whether the homebuyer lived in dispersed housing while in DHA as compared with conventional developments or housing obtained using Housing Choice Vouchers. Finally, an indicator is included that notes whether the house was purchased before 2006, which marks the collapse of the housing market and the start of the Great Recession in Denver.

Having estimated the logit regression, one can then use fitted probabilities for each individual in the sample. Those fitted probabilities are the propensity score—the estimated probability that an individual with the same characteristics would have opted to enroll, participate in, and complete the HOP program. A control group is then created using propensity score matching and the *Match* command in the *Matching* package, version 4.9-9, in R version 4.0.4 (Sekhon, 2011). For each HOP graduate, the single non-HOP graduate with the closest propensity score to the graduate is selected. If nontreated observations are tied as the nearest neighbor for an observation, all are included in the control group but weighted such that the sum of the weights is 1. Thus, the control group approximates the size of the treatment group. The treatment group provides the $Y_i(1)$ directly, and the matched control observation for each treatment provides $Y_i(0)$: the assumption is that the matched observation provides the unobserved potential outcome if that individual had not graduated from HOP. Because each outcome analyzed in this study is estimated for these control groups, and outcomes occurred at times during the homeowning experience, the composition and sample sizes of the treatment and control groups vary by outcome.

Consistent with Abadie and Imbens (2016, 2006), the necessary assumptions of conditional independence, $Y(1),Y(0) \perp HOP|x$, and the common support assumption, $0 < p(x_i) < 1$, are followed. The conditional independence assumption states that after controlling for the selection variables used in the matching process, HOP participant status has no effect on the level of potential outcomes. The common support assumption states that no individual in the sample will either surely choose HOP or surely not choose HOP. Further, the probabilities of treatment are between 0 and 1 (Abadie and Imbens, 2016; Guo and Fraser, 2015; Rosenbaum and Rubin, 1983). No assumption is made about the minimum or maximum probability of treatment between the two groups. The distribution of estimated propensity scores for the HOP and non-HOP groups on the outcome of home value appreciation is shown in exhibit 2 to illustrate that the common support assumption is plausible (common support graphs for all study outcomes are available from the authors upon request).

Exhibit 2

Common Support Graph Depicting Propensity Score Distribution for Annualized Home Value Appreciation Outcome, by HOP Program Status



HOP = HomeOwnership Program.

Source: Data compiled by authors from Real Property records in the respective counties where homes were purchased

This process allows for a straightforward comparison of the means for the treated and control groups to ascertain the average treatment effect on the treated (*ATET*):

$$ATET = (\bar{Y}_t - \bar{Y}_c)$$

where $\bar{Y}_t$ is the outcome mean in the treated group and $\bar{Y}_c$ the outcome mean in the matched control group.

To assess match quality, the covariate balance for each outcome was verified using standardized differences and variance ratios (Austin, 2009). An illustrative example of this analysis, again using home value appreciation, is presented in exhibit 3; covariate balance tests for all outcomes are available from the authors upon request. Most matching variables are closely balanced following matching, with standardized differences falling within the 0.1 to 0.2 range suggested by Stuart (2019) between the two groups after balancing. One variable did not fall within the suggested range: HOP homeowners were more likely to be immigrants than were the matched comparison group—a standardized difference of 0.31. Although no caliper was explicitly imposed, Rosenbaum and Rubin (1983) suggest that a caliper of 0.25 times the standard deviation of the propensity score is sufficient to reduce bias, and Austin (2009) shows that a caliper of 0.2 times the standard deviation of the propensity score performs well in simulations. Imposing a caliper of that size would not have modified the matches here.

Exhibit 3

Illustrative Covariance Balance Statistics for Propensity Score Matching—Latinx Homeowners

	Standardized differences between treatment and control groups		Variance ratio	
	Raw	Matched	Raw	Matched
Female (%)	0.55	-0.17	0.42	2.22
Age 40 years or older (%)	-0.04	0.01	0.99	1.01
Immigrant (%)	-0.68	0.31	0.67	2.21
Attained schooling beyond high school (%)	0.24	0.00	3.99	1.00
Natural log yearly income	1.40	0.17	0.52	0.93
Single parent (%)	-0.20	0.01	1.10	1.00
Family size four or more (%)	0.11	0.16	0.96	0.95
Dispersed unit (%)	-0.36	-0.09	1.04	0.98
Time in DHA	0.45	0.07	1.04	0.98
Purchased home prior to 2006 (%)	-0.25	-0.03	1.64	1.04
Propensity score matching presented using illustration of covariance balance for annualized home value appreciation of original home				
Number of observations: 270 raw, 172 matched				
Treated observations: 85 raw, 85 matched				
Control observations: 185 raw, 87 matched				
Propensity scores are matched one-to-one with the nearest neighbor. If non-treated observations are tied with the nearest neighbor for an observation, all are included in the control group but weighted such that the sum of weights add to one.				

DHA = Denver Housing Authority.

Source: Data compiled by authors from unpublished administrative data from the Denver Housing Authority

To assess potential bias due to selection on unobserved variation in the treatment assignment process, sensitivity analysis was conducted by calculating Rosenbaum's bounds (DiPrete and Gangl, 2004; Rosenbaum, 2002) using the *rbounds* R package version 2.1 (Keele, 2014). Results for selected variables that were found to be statistically significant are presented in appendix B; full results are available from the authors upon request. Sensitivity analysis evaluates the potential bias in the estimate of the *ATET* based on hypothetical sizes of omitted variable bias in treatment assignment. The null hypothesis of the Wilcoxon signed-rank test is that there is no difference in medians between the treatment and control groups. The hypothetical odds ratios of omitted variables were tested from 1 to 3 in 0.1 increments. Gamma (**Γ**) values produced by the analysis refer to the odds ratios (OR) of different assignment to treatment due to unidentified covariates. Appendix B reveals that the treatment effect of HOP on receipt of 30-year fixed-rate mortgage terms is insensitive to an omitted variable with an OR as great as 3.0. In addition, the treatment effect of HOP on home value appreciation of the original home is as great as 2.5. In contrast, the *ATET* of HOP for experiencing a foreclosure or selling the original home via a short sale was insensitive to an omitted variable with an OR only as great as 1.4.

A combination of unobserved covariates is unlikely to have an OR as high as 3 for this program intervention after conditioning on gender, age, immigrant status, income, single-parent status, family size, duration in DHA, DHA housing program, and starting year in the program (as is done in this study). An OR of 1.4 is a reasonable size for an omitted variable, however, so we turned to the literature to assess possible sources of omitted variable bias on the experience of foreclosure or selling a home via short sale. One potential omitted variable is self-efficacy, which measures an individual's belief in the ability to successfully complete a task. In earlier work (Santiago and Galster, 2004), the authors developed a nine-item self-efficacy scale that focuses on participant beliefs in their ability to improve financial capability, build assets, complete the homeownership program, and become a homeowner. Unfortunately, that self-efficacy measure was not collected for all homeowners in the *Denver Housing Study* before home purchase because of the addition of the early HOP homebuyers and non-HOP homebuyers starting in 2008. Nonetheless, using a sample of HOP Phase I participants, Santiago and Galster (2004) found that expectations of becoming a homeowner in 5 years were associated with self-efficacy (OR = 1.190). Moreover, expectations of successfully exiting DHA were also associated with self-efficacy (OR = 1.237). In both examples, the magnitude of the OR was less than the gamma values detected in the sensitivity analysis. As a result of those observed effect sizes of potential omitted variables in previous research, the authors contend that the positive and statistically significant outcomes reported here are more likely the result of participating in and completing HOP and less likely caused by the selection process (e.g., differential persistence or self-efficacy). The precision of the estimates for experiencing a foreclosure or short sale should be interpreted with caution, however.

One limitation of this study is the relatively small sample size of Latinx homeowners from which the ATET estimates are derived; however, in simulations conducted by Pirracchio, Resche-Rigon, and Chevret (2012), they found that even small sample sizes (~50) did not introduce large biases in the propensity score matching estimators. The relatively small sample size for some of the outcome measures in this study reduces the precision and the ability to detect differences between the treatment and control groups. Nonetheless, the confidence intervals on the estimates, although wide, provide bounds on the size of the differences between the two groups.

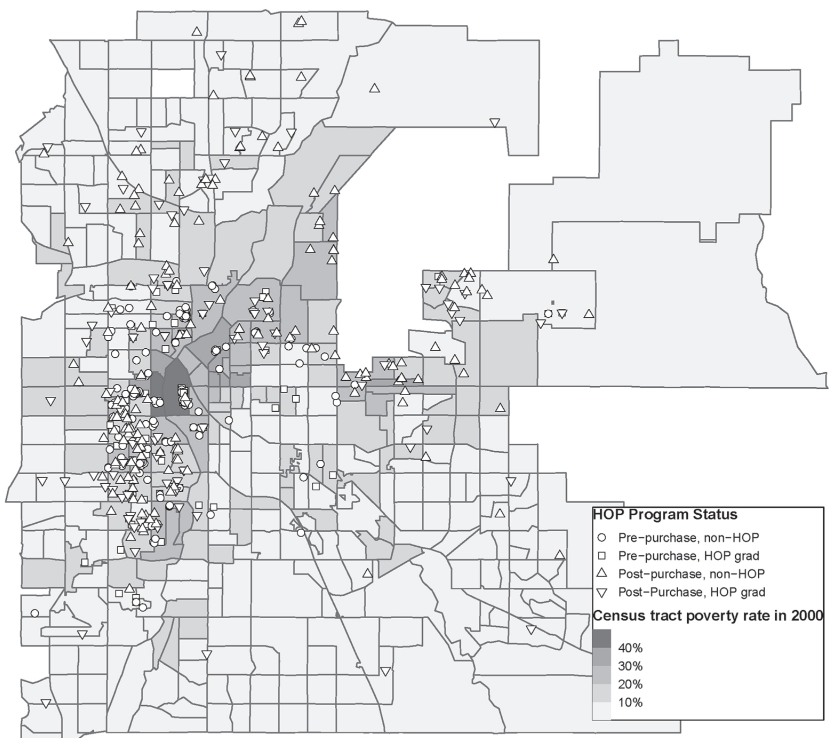
Results

The Spatial Location of Latinx Low-Income Homeowners in Denver

Exhibit 4 shows the residential locations of Latinx low-income homebuyers in the study both before and after purchasing their first homes. Before their purchase, both Latino HOP homebuyers and non-HOP homebuyers resided in subsidized housing units that were clustered in older neighborhoods in West Denver. Some homebuyers resided in neighborhoods with poverty rates that were higher than average for the City and County of Denver (15 percent in 2000), but unlike other large cities in the Northeast and Midwest, little evidence exists of concentrated poverty (> 40 percent) outside one census tract, where one public housing development (Sun Valley) is primarily bounded by railyards. Historically, West Denver was the epicenter of the Latinx enclave—an ethnic settlement spanning multiple generations. DHA housing developments are found in more than 60 percent of all Denver neighborhoods, but larger family units are clustered in North and West Denver. Although home purchases show some degree of clustering in established enclaves across North and West Denver, both Latinx HOP and non-HOP homebuyers also purchased in areas of new housing growth in East and South Denver. Further, both groups of Latinx homebuyers purchased homes in neighborhoods that were home to significant fractions of White homeowners.

Exhibit 4

Pre- and Postpurchase Residential Location of Latinx Homebuyers, by HOP Status



HOP = Home Ownership Program.
Source: Data compiled by authors, Denver Housing Study

Original Mortgage Terms and Conditions

As shown in exhibit 5, the average purchase price that Latinx homeowners paid for their first homes was approximately $140,000. As a point of reference, the average median home value in the Denver metro area was $166,600 in 2000. Latinx homeowners had limited equity in their homes at the time of purchase, with loan-to-value (LTV) ratios hovering around 95 percent regardless of HOP program status. Significant differences can be seen, however, between the two groups of Latinx homeowners relative to original mortgage terms and initial mortgage interest rates. Although 97 percent of all Latinx HOP homeowners had 30-year fixed-rate mortgages (the remainder had shorter term fixed-rate mortgages), only 57 percent of non-HOP homeowners did. Non-HOP homeowners typically held subprime adjustable-rate, interest-only, or balloon mortgages. The average interest rate at the time of home purchase was 6.03 percent for HOP homeowners compared with 7.26 percent for non-HOP homeowners. Given differences in the time of purchase, the interest rate spread over the prime rate was also compared using data from FRED (Board of Governors of the Federal Reserve System [US], 2021), but this finding was not statistically significant. Also, one of four HOP homeowners held second mortgages at the time of home purchase, typically silent second mortgages held by the Denver Housing Authority to assist homebuyers by lowering the amount borrowed on their original mortgages.

Exhibit 5

Original Mortgage Terms and Conditions for Latinx Homeowners, by HOP Program Status

Outcome	Mean by HOP Program status		Difference (ATET)	Standard Errors	N of Observations	
	Non-HOP (estimate)†	HOP Grad			Treated	Weighted Control
Purchase price of original home ($)	140,236	138,137	-2,098	9,864	92	92
Original mortgage was 30-year, fixed rate	**0.57**	**0.97**	**0.40**	**0.08**	**89**	**89**
Interest rate at time of purchase (%)	**7.26**	**6.03**	**-1.23**	**0.38**	**82**	**82**
Interest rate spread over prime at time of purchase (%)	-0.26	-0.52	-0.77	-0.51	82	82
Held second mortgage at time of purchase	0.16	0.25	0.09	0.08	85	85

†Estimate is difference of value for HOP group and ATET, and has same margin of error as ATET.
ATET = average treatment effect on the treated. HOP = HomeOwnership Program.
Notes: Differences with $p < 0.05$ bolded. Propensity scores are matched one-to-one with the nearest neighbor. If non-treated observations are tied with the nearest neighbor for an observation, all are included in the control group but weighed such that the sum of weights add to one.
Sources: Data compiled by authors using Office of Tax Assessor and Real Property data from the various counties where homes were purchased; unpublished administrative data from the Denver Housing Authority; and data obtained from the Denver Housing Study Baseline survey

Housing and Neighborhood Quality

Given concerns about the quality of housing and neighborhoods that low-income households can afford to purchase, this study used Real Property records, census-derived data, and systematic social observations to assess the conditions of the homes Latinx owners purchased, the physical and social conditions in the immediate neighborhood surrounding their homes, and the characteristics of the larger neighborhoods in which they resided before and at the time of purchase and over time. Those findings are presented in exhibits 6 through 10.

Housing Quality. Exhibit 6 provides a summary of the dwelling and parcel conditions of the homes purchased by Latinx homeowners. Compared with non-HOP homeowners, Latinx HOP homeowners resided in homes that were slightly larger in terms of square footage and the number of bedrooms and bathrooms. The majority of Latinx homeowners purchased single-family homes that were approximately 40 years old at time of purchase.

The 2010–11 systematic social observations included a thorough assessment of the exterior condition of the homes owned by Latinx homeowners and the upkeep of their properties at a point at which the majority of homeowners had resided in their homes for 5 years or more. Overall, Latinx homeowners had homes and yards that were well maintained, but the authors discovered three upkeep areas of significant difference between HOP and non-HOP homeowners. First, nearly 43 percent of the homes owned by HOP homeowners had security bars installed on windows and doors; by contrast, only 15 percent of homes owned by non-HOP homeowners did. Second, non-HOP homeowners were more likely to have windows that were broken, patched, or needing repairs (25 percent) compared with 5 percent of HOP homeowners. Finally, observers noted garbage on 5 percent of the parcels owned by HOP homeowners; none was observed on the non-HOP-owned properties.

Exhibit 6

Dwelling and Parcel Conditions of Homes Purchased by Latinx Homebuyers by HOP Program Status (1 of 2)

	Mean by HOP Program Status				N of Observations	
	Non-HOP (estimate)†	HOP Grad	Difference (ATET)	Standard Errors	Treated	Control
Dwelling Characteristics						
Square footage	**1,057.9**	**1154.9**	**97.0**	**(45.5)**	94	94
Number of bedrooms	**2.6**	**2.8**	**0.3**	**(1.2)**	94	94
Number of bathrooms	**1.4**	**1.7**	**0.4**	**(0.1)**	94	94
Has basement	**0.4**	**0.6**	**0.2**	**(0.1)**	94	94
Age of housing unit at time of purchase (years)	39.8	40.9	1.1	(3.6)	94	94
Type of Dwelling						
Single family home (%)	83.1	91.6	8.5	(7.5)	94	94
Townhome (%)	4.2	3.2	-1.1	(3.0)	94	94
Condo (%)	12.7	5.3	-7.5	(6.1)	94	94
Dwelling Conditions in 2010/2011						
Abandoned property (%)	3.8	0.0	-3.8	(2.5)	79	79
Façade/steps broken, missing or needing repairs (%)	15.0	12.5	-2.5	(6.3)	79	79
Walls with holes, peeling, needing repairs (%)	7.5	5.0	-2.5	(3.5)	79	79
Roofs/gutters with holes, patched, needing repairs (%)	3.8	2.5	-1.3	(3.2)	79	79
Windows broken, patched, needing repairs (%)	**25.3**	**5.0**	**-20.3**	**(4.9)**	79	79
Security bars on doors/windows (%)	**14.7**	**42.5**	**27.8**	**(10.5)**	79	79

Exhibit 6

Dwelling and Parcel Conditions of Homes Purchased by Latinx Homebuyers by HOP Program Status (2 of 2)

	Mean by HOP Program Status				N of Observations	
	Non-HOP (estimate)†	HOP Grad	Difference (ATET)	Standard Errors	Treated	Control
Parcel Conditions						
Trash (large items) (%)	6.3	2.5	-3.8	(3.7)	79	79
Litter (%)	3.7	6.3	2.5	(3.7)	79	79
Broken glass (%)	0.0	0.0	0.0	(0.0)	79	79
Abandoned or disabled vehicles (%)	0.0	2.5	2.5	(1.8)	79	79
Garbage (%)	**0.0**	**5.1**	**5.1**	**(2.4)**	79	79
Graffiti (%)	NA	0.0	0.0	NA	79	79
Weeds or lawns needing mowing (%)	17.4	25.0	7.6	(7.7)	79	79

†Estimate is difference of value for HOP group and ATET and has same margin of error as ATET.

ATET = average treatment effect on the treated. HOP = HomeOwnership Program.

Notes: Differences with $p < 0.05$ bolded. Propensity scores are matched one-to-one with the nearest neighbor. If nontreated observations are the nearest neighbor for an observation, all are included in the control group but weighted such that the sum of weights add to 1.

Sources: Real Property data; Denver Housing Study *systematic social observations conducted by authors (N=202)*

Quality of Surrounding Properties. Exhibit 7 provides a snapshot of the dwelling conditions of homes located on the block face where Latinx homeowners had resided for 5 years or more. For the most part, Latinx homeowners lived in areas where their neighbors also maintained the exterior of their homes and yards. Significant differences were found in three areas. First, Latinx HOP homeowners resided in neighborhoods where nearly one-third of the other homes also had installed security bars on their windows and doors; by contrast, bars were found on 24 percent of the homes in the neighborhoods where non-HOP homeowners lived. Second, nearly 3 percent of the homes where non-HOP homeowners lived were vacant and abandoned at the time of the systematic social observations, compared with less than 1 percent in the neighborhoods where HOP homeowners resided—a visible sign of the aftermath of the foreclosure crisis. Third, garbage was found strewn on lawns in about 2 percent of homes neighboring where Latinx HOP homeowners resided; this issue affected less than 1 percent of dwellings near non-HOP homeowners.

Exhibit 7

Dwelling and Parcel Conditions of Homes in the Immediate Neighborhood of Latinx Homeowners, by HOP Program Status, 2010–2011

	Mean by HOP Program Status				N of Observations	
	Non-HOP (estimate)†	HOP Grad	Difference (ATET)	Standard Errors	Treated	Weighted Control
Neighborhood Dwelling Conditions						
Abandoned property (%)	**2.5**	**0.8**	**-1.6**	**(0.8)**	**79**	**79**
Façade/steps broken, missing or needing repairs (%)	13.5	11.9	-1.6	(2.6)	79	79
Walls with holes, peeling, needing repairs (%)	5.4	4.4	-1.0	(2.1)	79	79
Roofs/gutters with holes, patched, needing repairs (%)	4.3	2.2	-2.1	(1.4)	79	79
Windows broken, patched, needing repairs (%)	3.4	3.1	-0.3	(1.5)	79	79
Security bars on doors/ windows (%)	**23.8**	**32.4**	**8.6**	**(3.4)**	**79**	**79**
Neighborhood Parcel Conditions						
Trash (large items) (%)	2.2	2.8	0.7	(1.2)	79	79
Litter (%)	4.9	3.6	-1.3	(1.1)	79	79
Broken glass (%)	0.3	0.3	0.1	(0.1)	79	79
Abandoned or disabled vehicles (%)	1.0	1.3	0.3	(0.2)	79	79
Garbage (%)	**0.8**	**2.2**	**1.4**	**(0.7)**	**79**	**79**
Graffiti (%)	0.2	0.1	-0.1	(0.1)	79	79
Weeds or lawns needing mowing (%)	26.1	15.7	-10.3	(5.4)	79	79

†Estimate is difference of value for HOP group and ATET and has same margin of error as ATET.

ATET = average treatment effect on the treated. HOP = HomeOwnership Program.

Notes: Differences with $p < 0.05$ bolded. Propensity scores are matched one-to-one with the nearest neighbor. If nontreated observations are the nearest neighbor for an observation, all are included in the control group but weighted such that the sum of weights add to 1.

Source: Denver Housing Study systematic social observations conducted by authors (N=202)

Neighborhood Public Infrastructure, Environmental Quality, and Land Use. During the systematic observations, the quality of public infrastructure in the neighborhood, any environmental quality issues, and current land use were documented. As shown in exhibit 8, Latinx homeowners in the study resided in predominantly residential neighborhoods comprising single-family homes, generally well-maintained infrastructure, and few noise or air quality issues. Latinx HOP homeowners resided in neighborhoods with a higher proportion of residential homes (95 percent vs. 90 percent) and a lower proportion of vacant properties (0.1 percent vs. 0.8 percent) than did non-HOP homeowners.

Exhibit 8

Public Infrastructure, Environmental Quality, and Land Use of Neighborhoods of Latinx Homeowners, by HOP Program Status, 2010–2011

	Mean by HOP Program Status				Observations	
	Non-HOP (estimate)†	HOP Grad	Difference (ATET)	Standard Errors	Treated	Weighted Control
Public Infrastructure						
Smooth street paving	48.6	57.5	8.9	(11.2)	79	79
Alley has visible trash/junk	12.6	7.5	-5.1	(5.7)	79	79
Environmental Quality						
Noticeable odors (air quality)	2.5	3.8	1.3	(4.6)	79	79
Noise from traffic (freeway or highway)	12.5	16.3	3.8	(8.6)	79	79
Noise from industrial activity	0.0	1.3	1.3	(1.3)	79	79
Noise from freight rail or light rail transit	0.0	2.5	2.5	(1.8)	79	79
Loud music heard	0.0	7.6	7.6	(2.9)	79	79
Other types of noise	5.0	7.5	2.5	(4.2)	79	79
Minimal or no noise	82.6	77.5	-5.1	(9.1)	79	79
Land Uses						
Operating residential frontage (%)	**90.4**	**95.1**	**4.7**	**(1.9)**	**79**	**79**
Operating commercial frontage (%)	2.6	0.9	-1.7	(2.2)	79	79
Operating industrial frontage (%)	0.0	0.3	0.3	(0.2)	79	79
Operating institutional frontage (%)	1.0	0.6	-0.4	(1.1)	79	79
Vacant residential frontage (%)	**0.8**	**0.1**	**-0.7**	**(0.3)**	**79**	**79**
Vacant non-residential frontage (%)	0.0	0.0	0.0	(0.4)	79	79
Transportation rights-of-way frontage (%)	3.9	0.0	-3.9	(2.9)	79	79
Parks, playgrounds, recreational facilities, watercourses, and green spaces (%)	0.0	1.7	1.6	(0.9)	79	79
Other land use (%)	1.4	1.4	0.0	(1.1)	79	79
Single-family homes (%)	68.8	87.1	18.2	(9.5)	79	79

†Estimate is difference of value for HOP group and ATET and has same margin of error as ATET.

ATET = average treatment effect on the treated. HOP = HomeOwnership Program.

Notes: Differences with $p < 0.05$ bolded. Propensity scores are matched one-to-one with the nearest neighbor. If nontreated observations are the nearest neighbor for an observation, all are included in the control group but weighted such that the sum of weights add to 1.

Source: Denver Housing Study, systematic social observations

Social Environment of Neighborhoods. During the systematic social observations in Denver, study team members were asked to note the presence of children and adults in the neighborhoods, the presence of others, and the types of activities that occurred during the observation period. Those observations of the neighborhood social environment are summarized in exhibit 9. Overall, the social environment where Latinx homeowners resided was similar for both groups of homeowners. The most frequently observed interactions were adults making home repairs outdoors and children playing in their yards. Children playing under the supervision of their parents was observed more often in neighborhoods where non-HOP homeowners resided (16 percent) than where HOP homeowners resided (8 percent).

Exhibit 9

Neighborhood Social Environment of Latinx Homeowners, by HOP Program Status, 2010–2011

Neighborhood Social Environment	Mean by HOP Program Status: Non-HOP (estimate)†	HOP Grad	Difference (ATET)	Standard Errors	Observations: Treated	Weighted Control
Security Features						
Presence of any police (%)	0.0	1.3	1.3	(0.8)	0	79
Human Activities						
Presence of children playing in front yard (%)	17.4	22.5	5.1	(6.8)	0.74	79
Presence of children playing on sidewalk or street (%)	3.7	5.0	1.3	(5.0)	0.25	79
Presence of children under adult supervision (%)	**16.4**	**7.5**	**-8.9**	**(1.2)**	**-7.51**	**79**
Presence of children (other) (%)	2.5	1.3	-1.3	(2.2)	-0.58	79
Presence of teenagers	8.6	17.5	8.9	(6.1)	1.45	79
Presence of teenagers in groups of three or more	2.5	1.3	-1.3	(4.3)	-0.30	79
Presence of adults (any)	73.9	65.0	-8.9	(8.9)	-0.99	79
Presence of adults hanging out, loitering	7.6	2.5	-5.1	(3.4)	-1.48	79
Presence of people drinking	0.0	1.3	1.3	(1.3)	0.99	79
Non-English languages heard	1.2	7.5	6.3	(3.4)	0.37	79

†Estimate is difference of value for HOP group and ATET and has same margin of error as ATET.

ATET = average treatment effect on the treated. HOP = HomeOwnership Program.

Notes: Differences with $p < 0.05$ bolded. Propensity scores are matched one-to-one with the nearest neighbor. If nontreated observations are the nearest neighbor for an observation, all are included in the control group but weighted such that the sum of weights add to 1.

Source: Denver Housing Study, systematic social observations

Pre- and Postpurchase Neighborhood Conditions. To what extent did Latinx homeowners experience improved neighborhood conditions after moving to their destination neighborhoods? Did prepurchase counseling influence the kinds of destination neighborhoods that homeowners selected? Exhibit 10 provides a summary of the census indicators that described the demographic composition, economic conditions, and housing conditions of the census tracts of both prepurchase and destination neighborhoods. An 11th indicator for suburban residence was added to describe destination neighborhoods. Two indicators require further explanation: neighborhood occupational prestige and residential instability. Neighborhood occupational prestige serves as a proxy indicator of affluence and reflects the mean level of occupational prestige based on the General Social Survey prestige score, weighted by the observed proportional distribution of occupations of employees within the tract. Scores range from 16 to 80, with higher scores indicating higher prestige. Residential instability reflects the percentage of individuals in the census tract who moved within the past 12 months and serves as an indicator of neighborhood turnover.

Exhibit 10

Pre- and Postpurchase Neighborhood Conditions of Latinx Homeowners, by HOP Program Status

	Mean by HOP Program Status				Observations	
	Non-HOP (estimate)†	HOP Grad	Difference (ATET)	Standard Errors	Treated	Weighted Control
Neighborhood Characteristics While Residing in DHA						
African-American residents (%)	5.9	7.1	1.2	(1.9)	94	94
Foreign-born residents (%)	30.2	24.4	-5.8	(2.4)	94	94
Female-headed households (%)	34.0	34.0	0.0	(2.7)	94	94
Poverty rate (%)	13.1	13.7	0.7	(2.5)	94	94
Unemployment rate (%)	8.6	9.5	0.9	(1.1)	94	94
Occupational prestige	37.0	37.8	0.8	(0.6)	94	94
Housing built before 1940 (%)	26.0	27.1	1.1	(3.2)	94	94
Renters (%)	37.4	34.1	-3.3	(3.1)	94	94
Vacancy rate (%)	**2.3**	**3.5**	**1.3**	**(0.5)**	**94**	**94**
Residential instability (%)	25.1	26.0	0.8	(1.7)	94	94
Characteristics of Destination Neighborhoods						
African-American residents (%)	6.0	9.4	3.3	(4.2)	94	94
Foreign-born residents (%)	19.3	21.3	2.0	(2.4)	94	94
Female-headed households (%)	23.1	26.8	3.7	(2.2)	94	94
Poverty rate (%)	**10.7**	**13.7**	**3.0**	**(1.5)**	**94**	**94**
Unemployment rate (%)	**5.3**	**6.5**	**1.1**	**(0.5)**	**94**	**94**
Occupational prestige score	38.5	37.9	-0.7	(0.8)	94	94
Housing built before 1940 (%)	8.4	12.3	3.9	(2.1)	94	94
Renters (%)	32.1	34.1	2.1	(2.4)	94	94
Vacancy rate (%)	2.2	2.8	0.7	(0.4)	94	94
Residential instability (%)	24.6	24.5	0.0	(1.5)	94	94
Suburban place of residence (%)	**58.1**	**32.6**	**-25.5**	**(8.2)**	**94**	**94**

†Estimate is difference of value for HOP group and ATET and has same margin of error as ATET.

ATET = average treatment effect on the treated. DHA = Denver Housing Authority. HOP = HomeOwnership Program.

Notes: Differences with $p < 0.05$ bolded. Propensity scores are matched one-to-one with the nearest neighbor. If nontreated observations are the nearest neighbor for an observation, all are included in the control group but weighted such that the sum of weights add to 1.

Sources: Geolytics National Change Database, 1970-2010; American Community Surveys, 2009-2018

Before home purchase and while living in DHA, Latinx homeowners resided in neighborhoods that were predominantly White but with large proportions of immigrants and female-headed households. Those neighborhoods had lower levels of occupational prestige, poverty rates hovering around

13 percent, and unemployment rates around 9 percent. Prepurchase neighborhoods had high proportions of renters, residential instability, and older housing stock. Vacancy rates were under 4 percent and were even lower in neighborhoods where non-HOP homebuyers resided while in DHA.

The postpurchase destination neighborhoods where Latinx homeowners lived during the 2010s suggest that buyers made decisions to move to more ethnically and income-diverse locations. Destination neighborhoods were still predominantly White but with slightly higher fractions of African-American residents and lower fractions of foreign-born residents. Fewer households were headed by females, and unemployment rates were lower. Latinx homeowners resided in newer subdivisions in the suburbs with fewer older housing units and low vacancy rates. Suburban residence was significantly higher for non-HOP homeowners who were encouraged to move into those higher priced neighborhoods whether they could afford the housing or not. Although the destination neighborhoods where Latinx HOP homeowners resided had higher poverty and unemployment rates than those of their non-HOP counterparts, HOP counseling would have assessed characteristics such as housing affordability and quality vis a vis other neighborhood conditions.

Mortgage Loan Refinancing and Modifications

As shown in exhibit 11, no statistically significant differences exist between Latinx HOP homeowners and non-HOP homeowners relative to mortgage loan refinancing and modifications. Between 21 and 25% of Latinx homeowners had mortgages that exceeded the value of their homes; those underwater mortgages were inextricably linked to the collapse of the housing market and the subsequent drop in home values during the Great Recession. Nearly one-half of non-HOP homeowners and one-third of HOP homebuyers had refinanced their original mortgages, and about one-half had modified their loans since purchasing their homes. In addition, slightly more than 10 percent of Latinx homeowners had modified their mortgage loans two or more times since purchase.

Exhibit 11

Refinancing and Loan Modifications to Original Mortgages by HOP Program Status

	Mean by HOP Program Status				N of Observations	
Outcome	**Non-HOP (estimate)†**	**HOP Grad**	**Difference (ATET)**	**Standard Errors**	**Treated**	**Weighted Control**
Original mortgage was "underwater"	0.21	0.24	0.02	0.08	89	89
Refinanced original mortgage	0.46	0.31	-0.16	0.11	85	85
Any loan modification	0.54	0.48	-0.06	0.11	85	85
Two or more loan modifications	0.16	0.10	-0.05	0.07	86	86

†Estimate is difference of value for HOP group and ATET and has same margin of error as ATET.

ATET = average treatment effect on the treated. HOP = HomeOwnership Program.

Notes: Differences with $p < 0.05$ bolded. Propensity scores are matched one-to-one with the nearest neighbor. If nontreated observations are the nearest neighbor for an observation, all are included in the control group but weighed such that the sum of weights add to 1.

Source: Data compiled by authors from Real Property information obtained from the counties where homes were purchased

Sustainability of Homeownership

The extant literature has underscored the precarity of low-income homeownership, often pointing to housing tenures that are cut short by unexpected familial and economic shocks and through limited gains in home value appreciation. In 2018, slightly less than one-half of the Latinx homeowners in the study still resided in their original homes (see exhibit 12). They had owned their homes, on average, for more than a decade, but those who had participated in the HOP program resided in their homes about 2 years longer. Moreover, one-third of Latinx HOP homeowners and one-fifth of non-HOP homeowners had sold their original homes by 2018. About 15 percent of HOP homeowners went on to purchase subsequent homes—twice as many as non-HOP homeowners. Although not statistically significant, approximately one-half of Latinx homesellers returned to renting after the sale of their original homes.

Latinx HOP homeowners also saw significantly higher home value than did non-HOP homeowners. In 2018, the value of the original homes owned by Latinx HOP homeowners was $58,000 more than that of their non-HOP counterparts ($321,653 vs. $263,142). Home value appreciation since the time of purchase was approximately 43 percent higher for HOP homeowners than for non-HOP homeowners ($185,210 vs. $128,630). Moreover, Latinx HOP homeowners saw an average annualized home value appreciation of $12,212 compared with $8,527 for non-HOP homeowners. As a point of reference, the 2018 median home value in the rapidly appreciating seven-county metro Denver region was $409,000, which suggests that although Latinx homeowners have homes that are appreciating, the rate of appreciation is still lower than that experienced by other homeowners in the region. The gap was narrower for HOP homeowners, though.

Exhibit 12

Indicators of Homeownership Sustainability by HOP Program Status Foreclosures and Short Sales

	Mean by HOP Program Status				N of Observations	
Outcome	Non-HOP (estimate)†	HOP Grad	Difference (ATET)	Standard Errors	Treated	Weighted Control
Total years of home ownership	10.4	12.1	1.7	1.5	93	93
Lived in original home in 2018 (%)	48.4	49.5	1.1	11.7	93	93
Original home appreciation ($) (if homeowner still in OH in 2018)	**128,630**	**185,210**	**56,580**	**24,265**	**47**	**47**
Original home appreciation (annualized) ($) (if homeowner still in OH in 2018)	8,527	12,212	3,684	1,957	47	47
Value of original home in 2018 (if still homeowner of record)	**263,142**	**321,653**	**58,512**	**21,122**	**47**	**47**
Sold original home (%)	18.8	32.3	13.4	9.8	93	93
Has purchased a second home (%)	7.0	14.0	7.0	7.0	93	93
Has purchased a third home (%)	0.0	1.1	1.1	1.6	93	93

†Estimate is difference of value for HOP group and ATET, and has same margin of error as ATET.
**Last home value of original home is 2018 if still owned; otherwise, it was the last recorded valued until time of foreclosure or sale.*
ATET = average treatment effect on the treated. HOP = HomeOwnership Program. OH = original home.
Notes: Differences with $p < 0.05$ bolded. Propensity scores are matched one-to-one with the nearest neighbor. If nontreated observations are the nearest neighbor for an observation, all are included in the control group but weighed such that the sum of weights add to 1.
Sources: Data compiled from Office of Tax Assessor and Real Property in the counties where homes were purchased

By the end of 2018, about 20 percent of all Latinx homeowners in the study had lost their homes to foreclosure, with the majority occurring between 2006 and 2010, at the height of the Great Recession in Denver (exhibit 13). By 2018, an additional 3 percent of HOP homeowners and 27 percent of non-HOP homeowners had executed a short sale to avoid foreclosure. Combined housing losses to foreclosures or short sales, therefore, were significantly higher among non-HOP homeowners. The probability of foreclosure or short sale for non-HOP homeowners was 25 percentage points higher than for HOP homeowners.

Exhibit 13

Foreclosures Experienced by Latinx Homeowners through 2018 by HOP Program Status

	Mean by HOP Program Status				N of Observations	
Outcome	**Non-HOP (estimate)†**	**HOP Grad**	**Difference (ATET)**	**Standard Errors**	**Treated**	**Weighted Control**
Ever foreclosed original home	0.20	0.19	-0.01	0.08	89	89
Foreclosed or made a short sale	**0.47**	**0.22**	**-0.25**	**0.10**	**89**	**89**
Sold original home	0.18	0.26	0.08	0.08	89	89

†*Estimate is difference of value for HOP group and ATET, and has same margin of error as ATET.*

ATET = average treatment effect on the treated. HOP = HomeOwnership Program.

Notes: Differences with $p < 0.05$ bolded. Propensity scores are matched one-to-one with the nearest neighbor. If nontreated observations are the nearest neighbor for an observation, all are included in the control group but weighted such that the sum of weights add to 1.

Source: Data compiled by authors from Real Property and Office of Tax Assessor in the counties where homes were purchased

Exhibit 14 examines more closely the timing of first home purchases, foreclosures, and short sales. Latinx homebuyers who purchased their homes before 2000 experienced few foreclosures or short sales before 2006, and those that occurred were tied to the deaths of primary wage earners. Most foreclosures and short sales for those early Latinx homebuyers occurred between 2006 and 2010. By 2018, nearly 19 percent of pre-2000 Latinx homebuyers had lost their homes. By contrast, almost 48 percent of Latinos who purchased their homes between 2001 and 2005 lost them to foreclosure or short sale by 2018, with most occurring during the Great Recession. Although significantly fewer Latinos purchased homes during the Great Recession than in previous periods, approximately two-thirds were still homeowners in 2018, whereas 28 percent lost their homes during the Great Recession and post-Recession recovery. Latinx homebuyers in the 2001–05 period purchased homes at the top of a housing bubble in Denver and—based on a review of Real Property administrative data and retrospective survey data—with predatory loan products. When the housing bubble burst in 2006, the housing market in Denver plummeted and triggered a massive wave of foreclosures, which prompted the start of the Great Recession in Denver much earlier than in other metro areas in the United States.

Exhibit 14

Timing of First Home Purchases and Foreclosures or Short Sales Robustness Checks

Year Purchased	Total Purchased	Never Foreclosed or Sold Short	Foreclosure or Short Sale Pre-2000	Foreclosure or Short Sale 2001-2005	Foreclosure or Short Sale 2006-2010	Foreclosure or Short Sale Post 2010	% Foreclosed or Sold Short
Pre 2000	118	96	1	3	16	3	18.6
2001-2005	139	73		15	44	7	47.5
2006-2010	46	33			6	7	28.3
Total	303	202	1	18	66	17	33.3

Sources: Data compiled by authors from Office of Tax Assessor and Real Property records in the counties where homes were purchased

As a robustness check, ordination least squares (OLS) regression models were estimated with fixed effects for the year of purchase and robust standard errors to predict whether completion of the HOP program was associated with obtaining a 30-year fixed-rate mortgage, owning the original home in 2018, experiencing a foreclosure or short sale, and home value appreciation by 2018. The results of those analyses are found in exhibit 15. The overall model Adjusted R^2 values ranged from 0.015 to .328, and the models were statistically significant for predicting a 30-year fixed-rate mortgage, ever experiencing a foreclosure or short sale, and home value appreciation. Compared with Latinx non-HOP homeowners, HOP homeowners had a 27 percent higher probability of obtaining a 30-year fixed-rate mortgage and a 16 percent higher probability of still owning their original home in 2018, although those coefficients were marginally significant ($p < .10$). HOP homeowners also were 21 percent less likely to have experienced a foreclosure or short sale ($p < .01$) by 2018. Being an HOP graduate had no effect on home value appreciation between the time of purchase and 2018 for those Latinx homebuyers who still owned their original homes.

Exhibit 15

OLS Regressions Predicting Selected Homeowner Outcomes

Selected Characteristics	Ever Foreclosed or Sold Short			Lived in Original Home in 2018			Mortgage was 30 Years, Fixed Rate			Original Home Appreciation (Still in OH in 2018 Only)		
Homebuyer Characteristics												
HOP graduate	-0.21	***	(0.08)	0.16	*	(0.08)	0.27	***	(0.06)	15931.10		(15994.76)
Age 40 or older	0.03		(0.06)	0.05		(0.07)	0.08		(0.05)	-8016.76		(10522.75)
Female	-0.06		(0.09)	0.03		(0.10)	-0.01	*	(0.07)	-4036.07		(29726.65)
Immigrant	-0.06		(0.06)	-0.03		(0.07)	0.04		(0.05)	-263.98		(14006.94)
Educational attainment of HS degree or higher	0.04		(0.12)	-0.16		(0.14)	-0.07		(0.12)	-34989.85		(23126.44)
Household Characteristics at Time of Move-in												
Single parent	-0.03		(0.08)	0.02		(0.08)	-0.04		(0.05)	21574.08		(16906.85)
Family size >= 4	-0.11	*	(0.07)	0.04		(0.07)	-0.01		(0.05)	4014.43		(11681.01)
Household income (ln)	0.05		(0.08)	-0.04		(0.08)	-0.03		(0.07)	-9836.64		(17163.15)
DHA Program Characteristics												
Duration in DHA greater >= 6 years	-0.01		(0.06)	0.02		(0.06)	-0.08	*	(0.05)	-2161.20		(11530.98)
27	-0.10		(0.06)	0.08		(0.07)	-0.05		(0.05)	-8105.68		(11521.54)
Fixed effects for year of purchase	YES			YES			YES			YES		
N	270			270			275			122		
R2	0.202			0.110			0.257			0.467		
Adjusted R2	0.117			0.015			0.179			0.328		
F-statistic	2.365	***		1.159			3.292	***		3.362	***	
df	26; 243			26; 243			26; 248			25; 96		

**p<0.1; **p<0.05; ***p<0.01, based on robust standard errors.*

DHA = Denver Housing Authority. HOP = HomeOwnership Program. OH = original home. OLS = ordinary least squares.

Source: Data compiled by authors

Conclusions, Caveats, and Implications

Many concerns have been raised about the long-term viability of homeownership for low-income, minority households, especially given the devastating impact that the housing market crash and subsequent Great Recession had on those families. Numerous scholars (e.g., Bayer, Ferreira and Ross, 2016; Bocian, Li and Ernst, 2010; Garriga, Ricketts, and Schlagenhauf, 2017; Immergluck, Earl, and Powell, 2019; Reid et al., 2017) have underscored the disproportionate losses experienced by Latinx homeowners—losses facilitated by predatory practices in the housing and mortgage lending markets that took advantage of vulnerable and uninformed prospective buyers. Scholars, community leaders, and policymakers have called for the use of homebuyer education and counseling programs as tools to combat such predation. Although those programs have garnered considerable attention and popularity in light of the Great Recession, findings about their impact are mixed. Information is lacking about the long-term impact of those programs for sustaining homeownership and good housing and neighborhood quality. Also, the effectiveness of those programs across various groups of prospective homebuyers has been woefully understudied. Of particular relevance to this study, there is a dearth of empirical evidence that assesses the impact of homebuyer education and counseling for Latinx homebuyers.

This study has addressed several of those gaps by examining the impact of HOP, an innovative public housing authority-administered homebuyer education and counseling program in Denver. Using data from 303 low-income homebuyers who left public housing for homeownership, the authors were able to test for program impacts on a wide array of outcomes and over durations that are much longer than prior studies. Homeownership outcomes were assessed for 95 Latinx homebuyers who participated and completed HOP and a comparison group of 208 non-HOP homebuyers who were matched using propensity score techniques.

HOP homebuyers benefited from securing 30-year fixed-rate mortgages and lower interest rates at the time of purchase and avoiding the risky loan products that were more common among non-HOP homebuyers in this study and among Latinx homebuyers in general (Garriga, Ricketts, and Schlagenhauf, 2017; Immergluck, Earl, and Powell, 2019; NCRC, 2020). Overall, Latinx homebuyers experienced positive gains with moves to their postpurchase destination neighborhoods within the Denver metropolitan area, buying homes that were of good quality in neighborhoods with increasing home values. At least in the case of Denver, some of the fears expressed by scholars and policymakers—particularly about the limited wealth-building capacity and returns to minority homeownership (e.g., Kochhar, Fry, and Taylor, 2011; Shapiro, 2006; Thomas, Mann, and Meschede, 2018)—have been allayed, although those gains still lag behind the average for the metropolitan area. Latinx homebuyers in this study also experienced high rates of foreclosures or short sales, however, triggered primarily during the Great Recession, and at levels that were even higher than those estimated by Garriga, Ricketts, and Schlagenhauf (2017) and Reid and colleagues (2017). The rate of default and short sales was significantly lower for HOP homeowners—most likely tied to the better mortgages they secured at the time of purchase and their access to HOP counseling assistance after home purchase when owners ran into difficulties. Those lower default rates associated with completion of homeownership education and counseling are consistent with findings reported by Avila, Nguyen, and Zorn (2013); Mayer and Temkin (2016); and Temkin et al. (2014).

The findings here also are consistent with previous studies that suggest homebuyer education and counseling can mitigate the risks associated with homeownership among vulnerable homebuyers, especially low-income minority homebuyers (see Parrott and Payano, 2016; Santiago, Galster, and Smith, 2017; Strochak, Young, and McCargo, 2019). Further, the findings suggest that program impacts may endure long beyond the early years of homeownership. The authors conclude that completion of HOP seems to have facilitated the long-term viability of homeownership for low-income Latinx homeowners compared with their non-HOP peers by significantly increasing the duration of homeownership tenure; facilitating the purchase of homes in neighborhoods that experienced significant appreciation in home equity; and decreasing the likelihood of housing loss through foreclosure or short sale. The impacts observed may be tied to counseling that emphasizes how to make sound home purchases and navigating the mortgage lending process, the assistance that HOP provides in securing the most favorable mortgage terms and conditions possible, and the open-door policy at DHA that has enabled HOP graduate homebuyers to seek assistance when issues have surfaced after home purchase.

Caveats

The authors offer several contextual comments so the study results can be interpreted with proper caution. First, the study is based on a sample of Latinx former recipients of subsidized housing in Denver. About one-third of them participated in HOP, and the remainder did not; however, all of those individuals went on to purchase their homes. The experiences of the Latinx homebuyers observed in this study are not representative of all Latinx homebuyers or all low-income homebuyers, nor are they representative of all households receiving rental housing assistance.

In addition, the vast majority of HOP participants never complete the program, and completion rates are similar to what has been reported for other programs nationally. Findings from previous work suggest that participants acquire financial capability skills that they take with them even if they do not complete the HOP program (see Santiago and Leroux, 2021). Earlier analyses of HOP attrition (Santiago and Galster, 2008) suggest three critical transition points for HOP participants: at 4 months after program entry, at 12 months, and then at 24 months. Early program exiters leave primarily because of program noncompliance—for example, they failed to comply with DHA or Housing Choice Voucher (HCV) housing regulations, did not complete required documentation, or did not attend the required HOP orientation and money management assessment sessions. Program exiters at 12 months or between years one and two of the program often are associated with positive program exits—for example, those individuals move into private rentals because of increasing income or relocate for job or educational opportunities. Participants who leave HOP toward the end of their program but before completion often have experienced familial or economic shocks that have to be resolved before they resume homebuyer activities. Previous work (Santiago, Galster, and Smith, 2017) suggested streamlining or automating ways in which participants can meet HOP requirements, particularly through the use of online forms and program options, and making available other forms or formats of homebuyer education and counseling to increase access. That suggestion has already happened with the introduction of the 1-day Colorado Housing and Finance Authority (CHFA) course that DHA administers to first-time homebuyers in the Denver metropolitan area and was required for all current HOP participants or interested homebuyers during the past 15 months because of the COVID-19 pandemic.

Finally, our analyses are still based on relatively small, matched samples of fewer than 100 participants in treatment and control groups. Although Pirracchio, Resche-Rigon, and Chevret (2012) found that sample sizes lower than these did not introduce large biases in the propensity score matching estimators, some of these parameters are measured less precisely and could contribute to the inability to detect differences between the treatment and control groups for some outcomes that may be significant.

Implications for Homebuyer Education and Counseling Programs

The findings of this study suggest several strengths of homebuyer education and counseling programs such as HOP for Latinx and other minority homebuyers. Because Latinx HOP homebuyers experienced superior home value appreciation relative to their non-HOP peers, the efforts by HOP to educate new buyers about desirable dwelling and neighborhood conditions seem to have been successful. Moreover, the ability of HOP to arrange for downpayment assistance and favorable mortgage financing at fixed rates provided Latinx homebuyers with the strong financial foundation needed to build sustainable homeownership and mitigate against foreclosure or short sales. Finally, the HOP program delivery model suggests the utility of a multipronged approach to low-income homeownership that includes (1) pre- and postpurchase financial capability and asset-building activities, such as money management and credit counseling; (2) pre- and postpurchase homebuyer education and counseling, including home maintenance and repairs that foster home value appreciation; (3) savings incentives, such as matched savings accounts and escrow accounts; and (4) fixed-rate mortgages at reasonable interest rates. For Latinx homebuyers, this type of homebuyer education and counseling program can lead to sustaining *hogar dulce hogar* (home sweet home).

Appendix A

DENVER HOUSING STUDY
HOMEOWNERS
STREET OBSERVATION FORM

DHS ID:		ADDRESS	
DATE:		NEIGHBORHOOD	
COMPLETED BY:		CENSUS TRACT	
TIME OF DAY:		WEATHER CONDITIONS AT TIME OF SURVEY	

1a. To access the block, did you need to pass through a single entrance to the community?

- o No
- o Yes

1b. ***If Yes:*** Was this entrance staffed by security?

- o No
- o Yes

2. Condition of street paving on block [check one]:

- o Holes in pavement large enough to cause potential harm to vehicles, bikes or pedestrians
- o Some minor holes, bumps, cracks or irregularities in pavement
- o Consistently smooth surfaces
- o Under construction/resurfacing
- o Street not paved

3. Sidewalks: Does block have paved sidewalks?

- o No
- o Yes

4. Condition of alleys [check one]:

- o Alleys contain sufficient trash, junk, etc. to impede traffic
- o Alleys contain visible trash, junk, etc. but not enough to impede traffic
- o Alleys do not contain visible trash, junk, etc.
- o Does not have alleys

5. Air Quality: Are there any noticeable odors on the block face from within your car, such as smoke, chemicals, sewers, garbage, etc.?

- o No
- o Yes

6. Noise Quality: Can noise from any of the following sources be heard on the block face from within your car:

- o Traffic from a limited-access (freeway) highway?
- o Industrial activity?
- o Freight rail or light-rail transit services?
- o Other, please specify: ______________________
- o There is minimal/no noise on the block face from within the car.

7. What is the approximate share of the frontage of the block face (both sides, including corners) constituting:
[NOTE: in Q. 7, "frontage" means the linear footage, not the number of parcels]

LAND USE	***PERCENT***
Operating (occupied or vacant but ready for occupancy) residential properties	_______%
NON-operating (abandoned) residential properties	_______%
Operating commercial or retail (stores, offices, gas stations) buildings	_______%
Operating industrial, construction or transportation buildings	_______%
Operating institutional (schools, hospitals) buildings	_______%
NON-operating (closed or abandoned) non-residential buildings-facilities of all types	_______%
Transportation rights-of-way (major roads, railroads)	_______%
Parks, playgrounds, recreational facilities, green space, watercourses	_______%
Other land uses not noted (Write in):	_______%
Note: the above percentages must sum to 100% [ensure that they do]	_______%

8. Density: What percentage of the Residential Parcels (multifamily building=one parcel) are single-family detached homes?

__________ %

DENVER HOUSING STUDY
HOMEOWNERS
SOCIAL OBSERVATION FORM

DHS ID:		ADDRESS	
DATE:		NEIGHBORHOOD	
COMPLETED BY:		CENSUS TRACT	
TIME OF DAY:		WEATHER CONDITIONS AT TIME OF SURVEY:	

1. Did you see a **police officer** on the block face? (***CIRCLE ALL THAT APPLY)***
   In a vehicle…………………………………… 1
   On a bicycle/horseback…………………….. 2
   On foot………………………………………… 3
   Did not see a police officer........................ 9

2. Did you see any **private security guards** on the block face?
   Yes……………………….......................... 1
   No…………………………………................. 0

3. Did you see any **children** on the block face?
   (CIRCLE ALL THAT APPLY)
   Playing in the front private yards……………..... 1
   Playing on the sidewalk or in the street…......... 2
   Under adult supervision/accompanied by an adult ……………………………………….. 3
   Arguing, fighting, acting hostile or threatening… 4
   Saw children but not in above activities……….. 5
   Did not see any children…………………........... 9

4. Did you see any **teenagers** on the block face?
   Yes……………………………………………… 1
   No (GO TO 9)………………………………….. 0

5. Did you see **any teenagers in groups** of three or more?
   Yes……………………………………………… 1
   No (GO TO 9)………………………………….. 0

6. Were teenagers in the groups you saw **male, female, or mixed**?
   All male………………………………………… 1
   All female……………………………………… 2
   Mixed male/female…………………………… 3
   Did not see teenagers in peer groups…….. 9

7. Did you see teenagers in the group who were..?
   (CIRCLE ALL THAT APPLY)
   Wearing the same style clothes?.................... 1
   Wearing the same color(s)?........................... 2
   Wearing the same insignia?........................... 3
   Wearing the same hats, jewelry, or shoes?.... 4
   Saw teenagers in groups but none of the above…………………………………………. 5
   Did not see any teenagers in groups………. 9

8. Did any of the groups of teens you saw appear to be a **gang**?
   Yes……………………………………………… 1
   No……………………………………………….. 0
   Did not see teenagers in groups……………. 9

9. Did you see any **adults** on the block face?
   Yes……………………………………………… 1
   No (GO TO 12)………………………………… 0

10. Did you see any adults on the block face **loitering, congregating or hanging out**?
    Yes……………………………………………… 1
    No……………………………………………… 0

11. Did you see any **prostitutes** work on the block face?
    Yes…………………………………………….. 1
    No……………………………………………… 0

12. Did you see any **homeless** people or people **begging** on the block face?
    Yes……………………………………………… 1
    No……………………………………………… 0

13. Did you see people who were **selling illegal drugs** on the block face?
    Yes……………………………………………… 1
    No………………………………………………. 0

14. Did you see any people drinking **alcohol** openly on the block face?
    Yes……………………………………………… 1
    No……………………………………………….. 0

15. Did you see any **drunken** or otherwise **intoxicated people** loiter on the block face?
    Yes……………………………………………… 1
    No……………………………………………….. 0

16. Did you hear **loud music** playing from boom boxes or any of the buildings on the block face?
    Yes……………………………………………….. 1
    No……………………………………………......... 0

17. Did you hear or see another **language** other than English on the block face? ***(CIRCLE ALL THAT APPLY)***
    Heard or saw other language(s) but don't know which one………………………………. 01
    Spanish…………………………………………. 02
    Other, Specify________________________ 03
    No people around or did not hear or see any non-English language(s)…………………… 99

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Appendix B. Rosenbaum Sensitivity Analysis for Selected Significant Outcomes

Original Mortgage Terms: 30-year Fixed Rate

Gamma	Lower Bound Significance Level	Upper Bound Significance Level
1.00	0	0
1.10	0	0
1.20	0	0
1.30	0	0
1.40	0	0
1.50	0	0
1.60	0	0
1.70	0	0.00001
1.80	0	0.00002
1.90	0	0.00004
2.00	0	0.00007
2.50	0	0.00065
3.00	0	0.00303

Experienced Foreclosure or Sold Original Home via Short Sale

Gamma	Lower Bound Significance Level	Upper Bound Significance Level
1.00	0.00227	0.00227
1.10	0.00079	0.00589
1.20	0.00028	0.01293
1.30	0.0001	0.02486
1.40	0.00004	0.04295
1.50	0.00001	0.06803
1.60	0	0.10032
1.70	0	0.13946
1.80	0	0.18456
1.90	0	0.23438
2.00	0	0.28748
2.50	0	0.55549
3.00	0	0.75676

Home Value Appreciation of Original Home		
Gamma	**Minimum Significance Level**	**Maximum Significance Level**
1	0	0
1.1	0	0
1.2	0	0
1.3	0	0
1.4	0	0
1.5	0	0.0001
1.6	0	0.0002
1.7	0	0.0005
1.8	0	0.001
1.9	0	0.0018
2	0	0.0032
2.5	0	0.0234
3	0	0.0803

Note: 1 gamma = odds of differential assignment because of unobserved factors.
Source: Data compiled by authors

Acknowledgments

This research was supported by grants from the Ford Foundation and the John D. and Catherine T. MacArthur Foundation. The opinions expressed herein do not necessarily reflect those of our funders. The authors would like to thank Renee Nicolosi of the Denver Housing Authority for providing access to administrative data and unwavering support for our research spanning more than two decades. Special thanks to two anonymous referees who offered valuable suggestions for clarifications and extensions of earlier drafts.

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References

Abadie, Alberto, and Guido W. Imbens. 2016. "Matching on the Estimated Propensity Score," *Econometrica* 84 (2): 781–807. DOI:10.3982/ECTA11293.

———. 2006. "Large Sample Properties of Matching Estimators for Average Treatment Effects," *Econometrica* 74 (1): 235–267. https://doi.org/10.1111/j.1468-0262.2006.00655.x.

Acolin, Arthur, Laurie Goodman, and Susan M. Wachter. 2019. "Accessing Homeownership with Credit Constraints," *Housing Policy Debate* 29 (1): 108–125.

Acolin, Arthur, Desen Lin, and Susan M. Wachter. 2019. "Endowments and Minority Homeownership," *Cityscape* 21 (1): 5–62. https://www.jstor.org/stable/10.2307/26608010.

Agarwal, Sumit, Gene Amromin, Itzhak Ben-David, Souphala Chomsisengphet, and Douglas D. Evanoff. 2010. "Learning to Cope: Financial Education and Loan Performance During a Housing Crisis," *American Economic Review* 100 (2): 495–500. https://www.aeaweb.org/articles?id=10.1257/aer.100.2.495.

Argento, Robert B., Lariece M. Brown, Sergei Koulayev, Grace Li, Marina Myhre, Forest Pafenberg, and Saty Patrabansh. 2019. "First-time Homebuyer Counseling and the Mortgage Selection Experience in the United States," *Cityscape* 21 (2): 51-74. https://www.jstor.org/stable/10.2307/26696376

Austin, Peter C. 2009. "Balance Diagnostics for Comparing the Distribution of Baseline Covariates Between Treatment Groups in Propensity-Score Matched Samples," *Statistics in Medicine* 28 (25): 3083–3107. http://doi.org/10.1002/sim.3697.

Avila, Gabriela, Hoa Nguyen, and Peter Zorn. 2013. The Benefits of Pre-Purchase Homeownership Counseling. McLean, VA: Freddie Mac. http://www.freddiemac.com/fmac-resources/perspectives/pdf/benefits_of_pre_purchase.pdf.

Bayer, Patrick, Fernando Ferreira, and Stephen L. Ross. 2016. "The Vulnerability of Minority Homeowners in the Housing Boom and Bust," *American Economic Journal: Economic Policy* 8 (1): 1–27.

Becketti, Sean, and Ajita Atreya. 2017. *Will the Hispanic Homeownership Gap Persist?* Freddie Mac Economic & Housing Research Insight. http://www.freddiemac.com/fmac-resources/research/pdf/201706-Insight-04.pdf.

Board of Governors of the Federal Reserve System (US). 2021. Bank Prime Loan Rate (MPRIME). St. Louis, MO: Federal Reserve Bank of St. Louis. https://fred.stlouisfed.org/series/MPRIME.

Bocian, Debbie G., Wei Li, and Keith S. Ernst. 2010. *Foreclosures by Race and Ethnicity: The Demographics of a Crisis*. Washington, DC: Center for Responsible Lending. https://www.responsiblelending.org/mortgage-lending/research-analysis/foreclosures-by-race-and-ethnicity.pdf.

Bowdler, Janis. 2009. *Significance of Housing Counseling in Stabilizing Minority and Latino Homeownership*. Testimony submitted by the National Council of La Raza at the Hearing on "The Role of NeighborWorks and Housing Counseling Intermediaries in Preventing Foreclosures." before the United States House of Representatives, Subcommittee on Housing and Community Opportunity, May 13. https://issuu.com/nclr/docs/file_significance_of_housing_counseling_intermedia.

———. 2005. *Jeopardizing Hispanic Homeownership: Predatory Practices in the Homebuying Market*. NCLR Issue Brief No. 15. Washington, DC: National Council of La Raza. http://publications.unidosus.org/handle/123456789/1072.

Collins, J. Michael, and Collin O'Rourke. 2011. *Homeownership Education and Counseling: Do We Know What Works?* Research paper No. 1102. Arlington, VA: Research Institute for Housing America. https://www.hudexchange.info/resource/275/homeownership-education-and-counseling-do-we-know-what-works/.

Cortes, Alvaro, Christopher E. Herbert, Erin Wilson, and Elizabeth Clay. 2007. "Factors Affecting Hispanic Homeownership: A Review of the Literature," *Cityscape* 9 (2): 53–91.

Cortes, Alvaro, Erin Wilson, Christopher E. Herbert, and Pedram Mahdavi. 2006. *Efforts to Improve Homeownership Opportunities for Hispanics: Case Studies of Three Market Areas*. Washington DC: U.S. Department of Housing and Urban Development, Office of Policy Development and Research. https://www.huduser.gov/portal/Publications/PDF/hisp_homeown2.pdf.

Denver Housing Authority (DHA). n.d. First-Time Homebuyer Education. http://www.denverhousing.org/LWU/residents/Homeownership/Firsttimehomebuyer/Pages/default.aspx.

———. n.d. Homeownership. http://www.denverhousing.org/LWU/residents/Homeownership/Pages/default.aspx.

Dey, Jaya, and Lariece M. Brown. 2020. "The Role of Credit Attributes in Explaining the Homeownership Gap Between Whites and Minorities Since the Financial Crisis, 2012–2018," *Housing Policy Debate*, DOI: 10.1080/10511482.2020.1818599.

Diaz, Lautaro. 2004. *Increasing Latino Homeownership Through Housing Counseling*. Testimony submitted by the National Council of La Raza to the U.S. House of Representatives Committee on Financial Services Subcommittee on Community and Housing Opportunity, March 18. http://publications.unidosus.org/bitstream/handle/123456789/1348/1421_file_IncreasingLatinoHome.pdf.

Ding, Lei, Roberto Quercia, and Janneke Ratcliffe. 2008. "Post-Purchase Counseling and Default Resolutions Among Low- and Moderate-Income Borrowers," *Journal of Real Estate Research* 30 (3): 315–344. https://doi.org/10.1080/10835547.2008.12091223.

DiPrete, Thomas A. and Markus Gangl. 2004. "Assessing Bias in the Estimation of Causal Effects: Rosenbaum Bounds on Matching Estimators and Instrumental Variables Estimation with Imperfect Instruments," *Sociological Methodology* 34 (1): 271–310. https://doi.org/10.1111/j.0081-1750.2004.00154.x.

Fannie Mae. 2003. *Understanding America's Homeownership Gaps: 2003 Fannie Mae National Housing Survey*. Washington, DC: Fannie Mae.

Flores, Lissette. 2014. *Latino Homeownership and Housing Counseling: An Alternative to FHA Policies*. CHCI white paper. Washington, DC: Congressional Hispanic Caucus Institute, Inc. https://chci.org/wp-content/uploads/2017/11/Latino_Homeownership_and_Housing_Counseling.pdf.

Galster, George C., Anna Maria Santiago, Richard J. Smith, and Joffré Leroux. 2019. "Benefit–Cost Analysis of an Innovative Program for Self-Sufficiency and Homeownership," *Evaluation Review* 43 (1–2): 3–40. doi.org/10.1177/0193841X19846697.

Garriga, Carlos, Lowell R. Ricketts, and Don Schlagenhauf. 2017. "The Homeownership Experience of Minorities During the Great Recession," *Federal Reserve Bank of St. Louis Review* 99 (1): 139–167. http://dx.doi.org/10.20955/r.2017.139-67.

Garza, Jose. 2020. "LULAC, Bank of America Join Forces to Boost Hispanic Homeownership." Washington, DC: League of United Latin American Citizens. https://lulac.org/news/pr/boa/.

Guo, Shenyang, and Mark W. Fraser. 2015. *Propensity Score Analysis: Statistical Methods and Applications*, 2nd ed. Thousand Oaks, CA: Sage Publications.

Gyourko, Joseph, Peter Linneman, and Susan Wachter. 1999. "Analyzing the Relationships Among Race, Wealth, and Home Ownership in America," *Journal of Housing Economics* 8 (2): 63–89.

Herbert, Christopher E., and Eric S. Belsky. 2008. "The Homeownership Experience of Low-Income and Minority Households: A Review and Synthesis of the Literature," *Cityscape* 10 (2): 5–59.

Hirad, Abdighani, and Peter M. Zorn. 2002. "Prepurchase Homeownership Counseling: A Little Knowledge Is a Good Thing." In *Low-income Homeownership: Examining the Unexamined Goal*, edited by Nicolas P. Retsinas and Eric S. Belsky. Washington, DC: Brookings Institution Press: 146–174.

Hizel, Erika, Charles Kamasaki, and Geraldine Schafer. 2002. *Increasing Hispanic Homeownership: Strategies for Programs and Public Policy*. NCLR Issue Brief No.7. Washington, DC: National Council of La Raza. http://publications.unidosus.org/bitstream/handle/123456789/1082/1392_file_IB7_IncreaseHispHome.pdf?sequence=1&isAllowed=y.

Howell, Junia, and Elizabeth Korver-Glenn. 2018. "Neighborhoods, Race, and the Twenty-First Century Housing Appraisal Industry," *Sociology of Race and Ethnicity* 4 (4): 473–490. DOI: 10.1177/2332649218755178.

Hyde, Allen, and Mary J. Fischer. 2021. "New Faces, New Neighbors? How Latino Population Growth and Lending Expansion Shapes the Neighborhood Racial and Ethnic Composition for White and Latino Homebuyers," *City & Community* 20 (2): 99–120. DOI: 10.1177/1535684120981344.

Ibarra, Beatriz. 2005. *Financial Counseling: A Meaningful Strategy for Building Wealth in the Latino Community*. Washington, DC: National Council of La Raza. http://publications.unidosus.org/bitstream/handle/123456789/1366/35644_file_WP_Financial_Counseling_FNL.pdf?sequence=1.

Immergluck, Dan, Stephanie Earl, and Allison Powell. 2019. "Black Homebuying After the Crisis: Appreciation Patterns in Fifteen Large Metropolitan Areas," *City & Community* 18 (3): 983–1002.

Jefferson, Anna, Jonathan Spader, Jennifer Turnham, and Shawn Moulton. 2012. *Foreclosure Counseling Outcome Study: Final Report: Housing Counseling Outcome Evaluation*. Washington, DC: U.S. Department of Housing and Urban Development, Office of Policy Development and Research. https://www.huduser.gov/portal/publications/hsgfin/foreclosure_counseling.html.

Johnson, Ryan M., and Elsa Macias. 1995. *Home to Own: A New Model for Community-Based Low-Income Mortgage Lending*. Tempe, AZ: Morrison Institute for Public Policy, Arizona State University.

Keele, Luke J. 2014. *rbounds: Perform Rosenbaum Bounds Sensitivity Tests for Matched and Unmatched Data*. R package version 2.1. https://CRAN.R-project.org/package=rbounds.

Kochhar, Rakesh, Richard Fry, and Paul Taylor. 2011. *Wealth Gaps Rise to Record Highs Between Whites, Blacks, Hispanics. Social & Demographic Trends Project*. Washington, DC: Pew Research Center. http://www. pewsocialtrends.org/2011/07/26/wealth-gaps-rise-to-record-highs-between-whites-blacks-hispanics/.

Kochhar, Rakesh, Ana Gonzalez-Barrera, and Daniel Dockterman. 2009. *Minorities, Immigrants and Homeownership: Through Boom and Bust*. Washington, DC: Pew Research Center. https://www.pewresearch.org/hispanic/2009/05/12/through-boom-and-bust/.

Martinez, Brandon P., and Alan A. Aja. 2020. "How Race Counts for Latinx Homeownership," *Critical Sociology*. DOI: 10.1177/0896920520974086.

Mayer, Neil S., and Kenneth Temkin. 2016. "Prepurchase Counseling Effects on Mortgage Performance: Empirical Analysis of NeighborWorks® America's Experience," *Cityscape* 18 (2): 73–98. https://www.huduser.gov/portal/periodicals/cityscpe/vol18num2/ch4.pdf.

Myhre, Marina L., and Nicole Elsasser Watson. 2017. *Housing Counseling Works*. Washington DC: U.S. Department of Housing and Urban Development, Office of Policy Development and Research. https://www.huduser.gov/portal/publications/hsgfin/housing-counseling-works.html.

National Association of Hispanic Real Estate Professionals (NAHREP). 2021. 2020 State of Hispanic Homeownership Report. https://nahrep.org/downloads/2020-state-of-hispanic-homeownership-report.pdf

National Community Reinvestment Coalition (NCRC). 2020. *Hispanic Mortgage Lending: 2019 HMDA analysis*. https://ncrc.org/hispanic-mortgage-lending-2019-analysis/.

Neal, Michael, Jung Hyun Choi, and John Walsh. 2020. *Before the Pandemic, Homeowners of Color Faced Structural Barriers to the Benefits of Homeownership*. Washington, DC: Urban Institute. https://www.urban.org/research/publication/pandemic-homeowners-color-faced-structural-barriers-benefits-homeownership.

Parrott, Jim, and Yamillet Payano. 2016. "Why the Low Hispanic Homeownership Rate Matters," *Urban Wire: Race and Ethnicity blog*, October 12. Washington DC: Urban Institute. https://www.urban.org/urban-wire/why-low-hispanic-homeownership-rate-matters.

Peck, Laura R., Shawn R. Moulton, Debbie Gruenstein Bocian, Donna DeMarco, and Nichole Fiore. 2019. *Short-Term Impact Report: The HUD First-Time Homebuyer Education and Counseling Demonstration, Preliminary Findings*. Washington, DC: U.S. Department of Housing and Urban Development, Office of Policy Development and Research. https://www.huduser.gov/portal/sites/default/files/pdf/Short-Term-Impact-Report.pdf.

Pirracchio, Romain, Matthieu Resche-Rigon, and Sylvie Chevret. 2012. "Evaluation of the Propensity Score Methods for Estimating Marginal Odds Ratios in Case of Small Sample Size," *BMC Medical Research Methodology* 12 (1): 70–80. https://doi.org/10.1186/1471-2288-12-70.

Quercia, Roberto, and Susan Wachter. 1996. "Homeownership Counseling Performance: How Can It Be Measured?" *Housing Policy Debate* 7 (1): 175–200.

Quillian, Lincoln, John J. Lee, and Brandon Honoré. 2020. "Racial Discrimination in the U.S. Housing and Mortgage Lending Markets: A Quantitative Review of Trends, 1976–2016," *Race and Social Problems* 12: 13–28.

Reid, Carolina K., Debbie Bocian, Wei Li, and Roberto G. Quercia. 2017. "Revisiting the Subprime Crisis: The Dual Mortgage Market and Mortgage Defaults by Race and Ethnicity," *Journal of Urban Affairs* 39 (4): 469–487.

Rosenbaum, Paul R. (2002). *Observational Studies* (2nd ed.). New York: Springer.

Rosenbaum, Paul R., and Donald B. Rubin. 1983. "The Central Role of the Propensity Score in Observational Studies for Causal Effects," *Biometrika* 70 (1): 41–55

Rothstein, Richard. 2017. *The Color of Law: A Forgotten History of How Our Government Segregated America*. New York: Liveright Publishing.

Sampson, Robert J., and Stephen W. Raudenbush. 2004. "Seeing Disorder: Neighborhood Stigma and the Social Construction of 'Broken Windows,'" *Social Psychology Quarterly* 67 (4): 319–342.

———. 1999. "Systematic Social Observation of Public Spaces: A New Look at Disorder in Urban Neighborhoods," *American Journal of Sociology* 105 (3): 603–651.

Sanchez-Moyano, Rocio. 2020. "Geography and Hispanic Homeownership: A Review of the Literature," *Journal of Housing and the Built Environment* 36: 215–240. https://doi.org/10.1007/s10901-020-09745-5.

Santiago, Anna Maria, and George C. Galster. 2008. *Not Just Buying a Home: The Effects of Participation in Homeownership Programs on Building Human, Financial and Social Capital Assets of Subsidized Housing Residents and Their Children*. Final report prepared for the Ford Foundation (New York) and the MacArthur Foundation (Chicago).

———. 2004. "Moving from Public Housing to Homeownership: Perceived Barriers to Program Participation and Success," *Journal of Urban Affairs* 26 (3): 297–324. DOI:10.1111/j.0735-2166.2004.00201.x.

Santiago, Anna M., George C. Galster, Angela A. Kaiser, Ana Santiago-Sanroman, Rebecca A. Grace, and Andrew T.W. Linn. 2010. "Low-Income Homeownership: Does It Necessarily Mean Sacrificing Neighborhood Quality to Buy a Home?" *Journal of Urban Affairs* 32 (2): 171–198.

Santiago, Anna Maria, George C. Galster, Jessica L. Lucero, Karen J. Ishler, Eun Lye Lee, Georgios Kyriotakis, and Lisa Stack. 2014. *Opportunity Neighborhoods for Latino and African American Children: Final Report*. Washington, DC: U.S. Department of Housing and Urban Development, Office of Policy Development and Research. https://www.huduser.gov/portal/Publications/pdf/Opportunity_Neighborhoods.pdf.

Santiago, Anna Maria, George C. Galster, and Richard J. Smith. 2017. "Evaluating the Impacts of an Enhanced Family Self-Sufficiency Program," *Housing Policy Debate* 27 (5): 772–788. doi.org/10.1080/10511482.2017.1295093.

Santiago, Anna Maria, and Joffré Leroux. 2021. "Family Self-Sufficiency Program Outcomes for Participants Enrolling During and After the Great Recession." Paper presented at the Financial Capability and Asset Building: Achievements, Challenges, and Next Steps. Virtual conference, February 25.

Sekhon, Jasjeet S. 2011. "Multivariate and Propensity Score Matching Software with Automated Balance Optimization: The Matching Package for R," *Journal of Statistical Software* 42 (7): 1–52. https://www.jstatsoft.org/v42/i07/.

Shapiro, Thomas M. 2006. "Race, Homeownership and Wealth," Washington University, *Journal of Law and Policy* 20: 53–74. https://openscholarship.wustl.edu/law_journal_law_policy/vol20/iss1/4.

Smith, Marvin M., Daniel Hochberg, and William H. Greene. 2017. "The Effectiveness of Pre-Purchase Homeownership Counseling: Evidence from a Randomized Study," *The Quarterly Review of Economics and Finance* 65 (1): 36–49.

Strochak, Sarah, Caitlin Young, and Alanna McCargo. 2019. "Mapping the Hispanic Homeownership Gap," *Urban Wire: Housing and Housing Finance blog*, August 12. Washington, DC: Urban Institute. https://www.urban.org/urban-wire/mapping-hispanic-homeownership-gap.

Stuart, Elizabeth A. 2019. "Propensity Scores and Matching Methods." In *The Reviewers Guide to Quantitative Methods in the Social Sciences*, 2nd ed., edited by Gregory R. Hancock, Laura M. Stapleton, and R. O. Mueller. New York: Routledge: 388–396.

Temkin, Kenneth M., Neil S. Mayer, Charles A. Calhoun, Peter A. Tatian, and Taz George. 2014. *National Foreclosure Mitigation Counseling Program Evaluation: Final Report, Rounds 3 Through 5*. Washington, DC: Urban Institute. https://www.neighborworks.org/Documents/HomeandFinance_Docs/Foreclosure_Docs/ForeclosureCounseling(NFMC)_Docs/2014_NFMC_UrbanInstituteReport.aspx.

Thomas, Hannah, Alexis Mann, and Tatjana Meschede. 2018. "Race and Location: The Role Neighborhoods Play in Family Wealth and Well-Being," *American Journal of Economics and Sociology* 77 (3–4): 1077–1111. DOI:10.1111/ajes.12239.

Turnham, Jennifer, and Anna Jefferson. 2012. *Pre-Purchase Counseling Outcome Study: Research Brief, Housing Counseling Outcome Evaluation*. Washington, DC: U.S. Department of Housing and Urban Development, Office of Policy Development and Research. https://www.huduser.gov/publications/pdf/pre_purchase_counseling.pdf.

UnidosUS. 2019. *The State of, and Barriers to, Latino Homeownership*. Testimony submitted to the House Financial Services Committee, Subcommittee on Housing, Community Development, and Insurance, May 16. http://publications.unidosus.org/bitstream/handle/123456789/1951/unidosus_statement_stateminorityhomeownership.pdf?sequence=1&isAllowed=y.

———. 2018. *Latino Homeownership Hanging in the Balance: Observations from the Home Mortgage Disclosure Act*. Fact sheet, March. http://publications.unidosus.org/bitstream/handle/123456789/1838/Latino%20HMDA%20Fact%20Sheet.pdf?sequence=4&isAllowed=y.

Wachter, Susan M., and Isaac F. Megbolugbe. 1992. "Impacts of Housing and Mortgage Market Discrimination on Racial and Ethnic Disparities in Homeownership," *Housing Policy Debate* 3 (2): 332–370.

Wilberg Ricks, Nancy. July 2009a. *Arrested Development: Foreclosures Eroding the Latino Community*. Washington, DC: UnidosUS. http://publications.unidosus.org/bitstream/handle/123456789/692/ArrestedDevForeclosure_FS.pdf?sequence=1&isAllowed=y.

———. 2009b. "A Brochure is Not Enough: Educating Latinos Through One-on-One Financial Counseling." Proceedings from NCLR Annual Conference Workshop, Chicago, IL, July 28. Washington, DC: NCLR. http://publications.unidosus.org/bitstream/handle/123456789/530/file_BrochureIsNotEnough.pdf?sequence=1&isAllowed=y.

Zhang, Sisi, and Robert I. Lerman. 2019. "Does Homeownership Protect Individuals from Economic Hardship During Housing Busts?" *Housing Policy Debate* 29 (4): 522–541. DOI: 10.1080/10511482.2018.1532447.

Movement Toward High Opportunity and Racial and Ethnic Integration for Hispanics in the Housing Choice Voucher Program

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Abstract

The Housing Choice Voucher (HCV) program is the nation's tenant-based rental assistance program, which offers the assisted household choice about where to live. Does that choice translate into movement into neighborhoods of high opportunity and racial or ethnic integration, especially among Hispanic households? Unique data from HUD permit tracking of individual households from 2010 through 2017.

That research finds that Hispanic households participate in the HCV program at a rate comparable to their share of the low-income population. The research also indicates that HCV households—particularly Hispanic households—are concentrated in low-opportunity areas in general. Those households tend to live in tracts where the racial or ethnic group of the household is dominant. HCV households who relocate from one census tract to another while in the program show some movement to higher-opportunity tracts, but the largest group of movers (43 percent) chose tracts at the same opportunity level. About 31 percent of households moved to a higher-opportunity neighborhood, but about 26 percent moved to lower-opportunity tracts. Hispanic households mirrored that pattern.

Movers in the program demonstrated very limited movement toward racial or ethnic integration. The largest group of movers (43 percent) located in tracts where their own racial or ethnic group was dominant, whereas 20 percent relocated to integrated neighborhoods. Hispanic households showed a similar pattern, with 48 percent relocating to Hispanic-dominated tracts and only 15 percent to integrated tracts.

Introduction

The Housing Choice Voucher (HCV) program remains the largest demand-side rental assistance program. Through the HCV program, the federal government seeks to achieve the twin goals of poverty deconcentration and racial and ethnic integration in its various housing programs (U.S. Department of Housing and Urban Development [HUD], 1996). The research reported here asks if the HCV program is achieving these goals over time, with a special focus on the outcomes for Hispanic households.

HUD has made available a dataset, the Longitudinal Household Data, that permits tracking of tenant-based HCV households over time as they move from one census tract to another. Those households are identified by race and ethnicity, permitting the opportunity to follow individual households over time rather than look at before and after samples of potentially different sets of assisted households.

Specifically, those data were used to determine if, upon relocation from one census tract to another, HCV recipients moved to census tracts offering higher levels of opportunity and if those moves also served to break down or reinforce patterns of residential segregation by race and ethnicity. In answering these questions, attention is given to the movement of Hispanic households compared with non-Hispanic households in the HCV program.

The diversity of the Hispanic population may complicate their capacity to exercise the choices offered in the HCV program. That diversity reflects, among other things, differences in immigration and citizenship status, fluency in English, racial identity, and country of origin (Arreola, 2009). Language issues may complicate the search for a housing unit, as can differences in familiarity with market search procedures (Cortes et al., 2007). The degree to which Hispanic households reside in ethnic enclaves or are assimilated into the broader population may also influence how they seek and obtain housing. Hispanics households may not have knowledge of resources available to assist in finding housing (Iceland and Nelson, 2008). Hanson and Santas (2014) found that different groups of Hispanic households experienced very different receptions in the housing market depending on their level of assimilation into the population as a whole and, in the case of immigrants, how recently the household arrived in the United States. Findings show that Hispanics often reside in tighter housing markets, making it difficult for them to succeed in securing better housing (Devine et al., 2003; Early, 2011). They may have some advantages over other minorities in that often they confront less crime than other minorities in the markets where they are able to locate (Lens, Ellen, and O'Regan, 2011); however, they may be unable to locate where schools are performing well (Horn, Ellen, and Schwartz, 2014). Previous research has identified a pattern over time indicating that Hispanic segregation is less severe than is Black segregation (Massey and Denton, 1987). That pattern has continued, but over time, Black segregation is lessening, whereas Hispanic segregation remains steady (Logan, 2013). At issue for this research is how that pattern plays out for households participating in the Housing Choice Voucher program.

Literature Review

A key reason for the appeal of rental vouchers is their potential to promote poverty deconcentration and racial integration (Ellen, 2020). Because vouchers enable recipients to rent housing in the private market, regardless of location, as long as the rent does not exceed the maximum allowable amount, they—at least in theory—are not required to live in particular neighborhoods (Sard and Rice, 2016). They are free to move into neighborhoods offering safety, good schools, parks, and other amenities, with easy access to employment opportunities, even if they do not exercise that freedom (Devine et al., 2003; Pendall, 2000; Schwartz, McClure, and Taghavi, 2016).

The research reported here found voucher recipients in 87 percent of U.S. census tracts in 2017. Prior research found that voucher recipients are less likely to live in impoverished, racially segregated neighborhoods than are public housing residents (McClure and Johnson, 2014). Compared with all renters, however, voucher households are underrepresented in more affluent and predominantly White neighborhoods. Black and Hispanic voucher holders are especially underrepresented in those areas (Newman and Schnare, 1997; Schwartz, McClure, and Taghavi, 2016). Moreover, the distribution of voucher recipients across neighborhoods with very high levels of poverty and racial segregation tracks closely with the distribution of units produced under the Low-Income Housing Tax Credit—the largest supply-side program in the nation (McClure, 2006).

The potential for voucher recipients to avoid impoverished, racially segregated neighborhoods is predicated on the assumption that households will exercise that residential choice offered by the voucher (Basolo and Nguyen, 2005). The hope was that given the ability to move to low-poverty, racially integrated neighborhoods, voucher recipients would choose to do so (McClure, 2010). Researchers have identified several factors that shape the residential outcomes of voucher recipients. Overall rental housing market conditions play a big role in determining the extent to which rental units are eligible for the HCV program and in influencing the willingness of landlords to participate in the programs. In "tight" housing markets with low vacancy rates, the rents for the few vacant units, especially in the more desirable neighborhoods, may exceed the maximum amount covered by the program (Finkel and Buron, 2001). Moreover, given the choice between an unsubsidized tenant and one with a voucher, landlords often prefer the former, thereby avoiding the "red tape" of program participation (Garboden et al., 2018). On the other hand, voucher recipients tend to be more successful in obtaining housing in areas with weaker housing markets. Landlords are frequently more amenable to having voucher recipients as tenants, in part because the rental income may be higher and steadier than what can be obtained from unsubsidized tenants (Rosen, 2020). In fact, landlords sometimes actively seek out voucher holders to rent housing in neighborhoods with the weakest housing demand (Garboden et al, 2018; Rosen, 2020).

Many recipients do not consider the full range of neighborhood options available to them or simply prefer to live in the neighborhoods with which they are most familiar (Basolo and Nguyen, 2005; Galvez, 2011; Rosen, 2020). Wang (2018), however, surveyed HCV households and found that those households place a high value on residing in a safe neighborhood with good schools but that barriers constrain their choice, often forcing them to locate in a neighborhood that is less desirable than the one they preferred. Black and Hispanic voucher recipients are least likely to reside in relatively affluent, racially integrated neighborhoods and are subject to clustering (Patterson and Yoo, 2008; Wang and Walter, 2017).

Residential options for voucher holders may also be constrained by real and perceived racial discrimination and by discrimination against voucher holders. Racial housing discrimination has been documented repeatedly over the past several decades (Turner et al., 2013). Although discrimination is less overt and pervasive than in the past, it continues to reduce residential opportunities for minority renters and homebuyers. Discriminatory practices make finding a home in many neighborhoods more difficult and time consuming for Black and Hispanic voucher recipients. In addition, many landlords refuse to rent to voucher recipients, even when state and local laws prohibit "source of income discrimination" (Tighe, Hatch, and Mead, 2017).

Residential choice for voucher holders can also be constrained by the limited time housing authorities give recipients to find a home that qualifies for the program (meets its physical quality standards, does not exceed the maximum allowable rent, and has an owner who is willing to accept a voucher). DeLuca, Wood, and Rosenblatt (2019) and Eva Rosen (2020) have shown that when pressed for time, voucher recipients frequently settle on a house or apartment in or near the communities they know best—usually the community in which they currently reside or the community in which they grew up. When voucher holders do not have access to a car or must juggle work and childcare to find time to look for potential homes, they are less able to explore housing opportunities in more distant locations (Blumenberg and Pierce, 2016; Pendall et al, 2015).

Finally, voucher recipients may prefer to live in the neighborhoods with which they are more familiar, neighborhoods where they have family and friends, where their children may attend school, and where they may attend religious services and participate in social programs (Boyd, 2008). Those preferences may also be shaped by their awareness, impressions, and knowledge of neighborhoods outside their familial and social worlds, however. If they have limited knowledge of other neighborhoods, they are less likely to consider them as potential places to live (DeLuca, Wood, and Rosenblatt, 2019).

In sum, the HCV program gives families the opportunity to reside in housing situated in a wide array of neighborhoods, but the extent of that opportunity is shaped, among other things, by housing market dynamics, discriminatory practices among landlords, and the perceptions and preferences of voucher participants.

Hispanics are the largest minority group in the United States, making up more than 18 percent of the total population in 2019, with considerable variation between the states (U.S. Census Bureau, 2020a). Among the assisted population, Hispanics are more likely to live in urban counties (Din and Helms Garrison, 2021). They form a diverse population that may confront special problems, such as limited language skills, as they attempt to navigate rental housing markets (Iceland and Nelson, 2008).

Previous research suggests that for the HCV program to succeed, both the market and the participating household must respond. Without special assistance, the ability of HCV households to significantly improve their neighborhood locations will likely be minimal, and minorities will likely fare worse than non-Hispanic Whites. Hispanic segregation among HCV holders may not be as great as the segregation of Blacks, but the level of Hispanic segregation will probably remain steady over time, whereas Black segregation is slowly subsiding. What remains to be seen is whether, at a national scale, the HCV program can help break down the barriers confronting minority renter households, especially Hispanic households, to move to high-opportunity neighborhoods that are integrated or predominantly White.

Data and Analytic Approach

HUD has constructed a longitudinal household database for all households who participated in rental assistance programs under its supervision, including the HCV program. HUD initiated automated tenant reporting in 1995, but the participating public housing authorities and managers of assisted properties took some time to adopt automated reporting. Reliable data thus exist only for years 2001 through 2017, when both the ethnicity (Hispanic or non-Hispanic) of the household head and the race of the household head are available. This study analyzes only tenant-based HCV households because of the mobility inherent in that program. The data are further narrowed to the years 2010 through 2017 to exclude the housing price bubble of the 2000-to-2007 period and its collapse in 2008 and 2009. Beginning in 2010, the market was in recovery, offering a better picture of how assisted households are able to compete with unassisted households for available rental housing units.

The research questions for this study address movement to high-opportunity neighborhoods and movement to either integrated or predominantly White neighborhoods. For that reason, the data were limited to include only those households who moved from one census tract to another during their participation in the HCV program.[1]

To answer the research questions, the locations where households choose to reside must be identified by the level of opportunity offered and by their racial and ethnic composition. To assess opportunity, we developed an index based on census tract-level data made available through the HUD Affirmatively Furthering Fair Housing initiative (Mast, 2015). The index is based on three variables: (1). poverty exposure—percentage of the population with income above the poverty line; (2). labor force engagement—employment and labor force participation; and (3). school quality—percentage of students reading and performing math exercises at grade level. The individual indexes range from zero to 99 and center on 50. For each tract, the scores are added, giving equal weight to each index. Census tracts are sorted from low to high and divided into quintiles, with the top two quintiles identifying the high- and very high-opportunity neighborhoods—the top 40 percent of all neighborhoods.[2] This approach follows the work of Schwartz, McClure, and Taghavi (2016).

[1] The available data do not indicate street address, only census tract. As such, movers are identified only by movement from one tract to another; movement within a tract is not identified.

[2] The neighborhood opportunity index used here does not include all HUD indicators. Missing from our opportunity index are data on crime, transportation, and environmental hazards. Crime is known to be an important factor in neighborhood choice, but no source exists for tract-level crime data at a national scale (Lens, Ellen, and O'Regan, 2011). Transportation is also difficult to include, as public transport access often is associated with neighborhoods containing low-income populations who cannot afford cars and are dependent on transportation access (Acevedo-Garcia et al., 2016). Although HUD offers an environmental hazard index, it may be unreliable at the tract level.

Exhibit 1 shows that the individual index components track very well with the categories of the combined index. The mean value of the component indexes rises as the tracts move from the lower to the higher opportunity categories.

Exhibit 1

Census Tracts by Opportunity Index Category
Mean Value of Components of Index, 2017

	'Tract Opportunity Index Category					
Neighborhood Opportunity Category	**Very Low**	**Low**	**Moderate**	**High**	**Very High**	**All Tracts**
Poverty Exposure	13.5	32.6	50.8	68.1	85.0	50.0
Labor Force Participation	14.5	32.6	50.3	67.5	85.0	50.0
School Quality	20.9	39.3	48.7	59.0	78.7	49.3
Number of Tracts	14,391	14,419	14,340	14,459	14,422	72,031

Source: U.S. Department of Housing and Urban Development, Affirmatively Furthering Fair Housing (AFFH) Assessment Tool Data Tables, 2015

Locations where households choose to reside also must be identified by the racial and ethnic composition of the census tracts. Data from the American Community Survey (2013 to 2017) are used here to identify the race and ethnicity of the populations residing in the tract (U.S. Census Bureau, 2020b).

We grouped all census tracts into five categories based on their racial and ethnic composition:

1. Predominantly Non-Hispanic White (75 percent or more of all households)
2. Predominantly Non-Hispanic Black (50 percent or more of all households)
3. Predominantly Non-Hispanic Other (50 percent or more of all households)
4. Predominantly Hispanic (50 percent or more of all households)
5. Integrated (all other tracts)

Although predominantly minority census tracts are defined as those where the minority group constitutes at least 50 percent of all households, the threshold for defining predominantly non-Hispanic White tracts is set higher, at 75 percent, because a tract may be more than 50 percent non-Hispanic White population but still have very high minority populations. Such tracts would typically be thought of as integrated. For that reason, tracts with less than 75 percent non-Hispanic White population and less than 50 percent of any one minority category are viewed as integrated. This also follows the work of Schwartz, McClure, and Taghavi (2016).

Analysis

What is the current racial and ethnic composition of the HCV program? Has it changed?

Hispanic households make up about 16 percent of households in the HCV program. That figure has been relatively stable, rising from 15 percent in 2010 to 16 percent in 2017 (see exhibit 2). That share is slightly below the 18 percent that Hispanics form within the U.S. population as a whole and is comparable to their 15-percent share of the HCV program-eligible population, households making less than $20,000 per year (U.S. Census Bureau, 2020b).[3]

Exhibit 2 also lists the share of participating households who moved from one tract to another while in the program. About 47 percent of HCV households moved from one tract to another at some time during their participation in the HCV program or other programs after initial entry into the HCV program;[4] thus, about one-half move and about one-half stay in place. A greater share of Black households moved, at 54 percent, whereas a lesser share of non-Hispanic White households moved, at 38 percent. Again, Hispanic households are between those two groups, at 45 percent.

With those understandings as background, the analysis turns to where HCV recipients reside by level of opportunity and by racial and ethnic composition of the neighborhood.

Exhibit 2

Households in the Housing Choice Voucher Program by Race and Ethnicity, 2010 and 2017

Race/Ethnicity	2010		2017		Moved During Assistance (%)
	Count	Percentage	Count	Percentage	
Non-Hispanic					
White	830,201	36%	799,528	33%	37.7
Black	1,030,794	45%	1,144,792	47%	54.1
Other	95,606	4%	100,958	4%	38.6
Hispanic	358,209	15%	387,919	16%	44.9
Total	2,314,810	100%	2,433,197	100%	46.6

Source: U.S. Department of Housing and Urban Development, Longitudinal Household Rental Assistance Data, 1995–2017

[3] Housing authorities are mandated to provide at least 75 percent of Housing Choice Vouchers to households with incomes at or below 30 percent of Area Median Income (AMI). Those authorities more than meet that requirement because the average household income of HCV households is about $14,000, which is well below 30 percent of AMI. The population making less than $20,000 a year thus is a good proxy for households whose extremely low income makes them eligible for admission to the HCV program.

[4] The data include all households in the HCV program in 2017 with information on their presence in any HUD-administered Rental Assistance Program back to 2010. Movers are identified as any household who moved from one census tract to another in the 8-year period. Note that many households may have moved upon entry to the program. The address of the household at the time of applying for admission to the program is not provided in the data. As such, the moves analyzed in this study only include moves while participating in the HUD programs.

How is the U.S. population distributed by race and ethnicity across census tracts by opportunity level?

The racial and ethnic composition of census tracts follows a predictable pattern. Minorities, including Hispanics, tend to be concentrated in low-opportunity tracts. Exhibit 3 examines the U.S. population by race and ethnicity as they are distributed across all of the tracts, categorized by opportunity level. Non-Hispanic Whites typically make up about 62 percent of the population in each tract, but on average, they make up only 34 percent of the population in very low-opportunity tracts and 76 percent in very high-opportunity tracts. Hispanics average about 16 percent of the population in each tract, but they constitute 28 percent of the population in very low-opportunity tracts and only 8 percent in very high-opportunity tracts.

Exhibit 3

Census Tracts by Opportunity Index Category
Average Percentage of Population by Race, 2017

	Tract Opportunity Index Category					
Percentage of Population by Race/Ethnicity	Very Low	Low	Moderate	High	Very High	All Tracts
Non-Hispanic White	33.6	58.5	68.7	73.4	76.3	62.1
Non-Hispanic Black	32.1	14.5	9.4	6.8	4.3	13.4
Non-Hispanic Other Races	6.6	6.9	7.6	8.7	11.3	8.2
Hispanic	27.8	20.1	14.3	11.1	8.0	16.2
Total Population	100.0	100.0	100.0	100.0	100.0	100.0

Note: Percentages may not add to 100 due to rounding.
Sources: American Community Survey, 2013–2017; U.S. Department of Housing and Urban Development, Longitudinal Household Data, 1995–2017

How is the population of the United States allocated by race and ethnicity across census tracts by dominant racial or ethnic group?

Minority households are not only concentrated in low-opportunity tracts, but they also tend to be concentrated in tracts where minorities are the dominant population. To illustrate the linkages between minority concentration and opportunity level, exhibit 4 categorizes tracts by the dominant racial or ethnic group and distributes them across opportunity levels.

More than one-half (54 percent) of all predominantly White tracts fall in the high- or very high-opportunity categories. Conversely, more than one-half of Hispanic-dominated tracts are found in the very low-opportunity category, with another 30 percent in the low-opportunity category. A mere 109 of more than 6,800 predominantly Hispanic tracts (1.6 percent) are in the very high-opportunity category. Integrated tracts offer a possible solution to the concentration of minorities in low-opportunity areas, but they are not a sure thing. About 39 percent of integrated tracts are in the upper two quintiles of tracts by opportunity level, but a comparable 40 percent are in the bottom two quintiles.

Exhibit 4

Census Tracts by Opportunity Index Category
Dominant Racial or Ethnic Population, 2017

	Tract Opportunity Index Category					
Percentage of Population by Race/Ethnicity	**Very Low**	**Low**	**Moderate**	**High**	**Very High**	**Total**
Non-Hispanic White	1,890	5,537	7,456	8,400	9,193	32,476
Greater than 75%	6%	17%	23%	26%	28%	100%
Non-Hispanic Black	4,078	1,160	512	201	57	6,008
Greater than 50%	68%	19%	9%	3%	1%	100%
Non-Hispanic Other Races	210	147	201	243	354	1,155
Greater than 50%	18%	13%	17%	21%	31%	100%
Hispanic	3,553	2,011	841	295	109	6,809
Greater than 50%	52%	30%	12%	4%	2%	100%
Integrated	4,655	5,556	5,325	5,312	4,698	25,546
	18%	22%	21%	21%	18%	100%

Note: Percentages may not add to 100 due to rounding.
Sources: American Community Survey, 2013–2017; U.S. Department of Housing and Urban Development, Longitudinal Household Data, 1995–2017

How are HCV households in 2017 distributed by race and ethnicity across tracts by opportunity level?

The analysis now turns to an examination of how HCV households, by racial and ethnic identification, have located in census tracts by opportunity level. Exhibit 5 illustrates the sad reality that HCV households tend to be concentrated in low-opportunity tracts. More than two-thirds (69 percent) of HCV households live in low- or very low-opportunity tracts. Only 15 percent are in high- or very high-opportunity tracts. Non-Hispanic Whites fare only slightly better than the program average, with 53 percent in low- and very low-opportunity tracts, but 76 percent of Hispanics locate in those tracts. Non-Hispanic Blacks are comparable, at 78 percent.

Exhibit 5

Housing Choice Voucher Households, 2017
By Race and Ethnicity and Tract Opportunity Index

	Tract Opportunity Index Category					
Percentage of HCV Households by Race/Ethnicity	Very Low	Low	Moderate	High	Very High	All Tracts
Non-Hispanic	174,198	190,363	156,370	112,525	55,715	689,171
White	25%	28%	23%	16%	8%	100%
Non-Hispanic	555,640	219,959	113,635	65,002	30,529	984,765
Black	56%	22%	12%	7%	3%	100%
Non-Hispanic	26,921	23,943	17,028	12,915	7,351	88,158
Other Races	31%	27%	19%	15%	8%	100%
Hispanic	165,269	81,641	42,338	26,517	11,237	327,002
Any Race	51%	25%	13%	8%	3%	100%
Total HCV	922,028	515,906	329,371	216,959	104,832	2,089,096
Households	44%	25%	16%	10%	5%	100%

HCV = Housing Choice Voucher.

Note: Percentages may not add to 100 due to rounding.

Sources: American Community Survey, 2013–2017; U.S. Department of Housing and Urban Development, Longitudinal Household Data, 1995–2017

How are HCV households in 2017 distributed by race and ethnicity across census tracts in which theirs is the dominant racial or ethnic group?

Exhibit 6 shifts the analysis to the distribution of HCV households, categorized by race and ethnicity, to the distribution across tracts categorized by dominant racial or ethnic group. The pattern is as expected. The largest share of each racial and ethnic group resides within tracts where the household racial or ethnic group is dominant. Hispanics display this pattern, with 51 percent of Hispanic HCV households located in predominantly Hispanic tracts. About 52 percent of non-Hispanic White HCV households locate in predominantly White tracts, and about 42 percent of Black HCV households locate in predominantly Black tracts. About 38 percent of all HCV households are found in integrated tracts. Hispanic HCV households make the lowest entry, at 34 percent, and Non-Hispanic Other the largest, at 47 percent.

Exhibit 6

Housing Choice Voucher Households, 2017
By Race and Ethnicity and Tract Opportunity Index

Percentage of HCV Households by Race/Ethnicity	Tract Predominant Racial/Ethnic Group: Non-Hispanic White	Non-Hispanic Black	Non-Hispanic Other	Hispanic	Integrated	Total, All Tracts
Non-Hispanic	359,401	19,630	5,471	41,212	266,004	691,718
White	52%	3%	1%	6%	38%	100%
Non-Hispanic	81,773	419,334	4,057	98,990	385,598	989,752
Black	8%	42%	0%	10%	39%	100%
Non-Hispanic	12,873	4,844	14,839	14,418	41,311	88,285
Other Races	15%	5%	17%	16%	47%	100%
Hispanic	24,639	20,573	4,390	166,560	111,934	328,096
Any Race	8%	6%	1%	51%	34%	100%
Total HCV	478,686	464,381	28,757	321,180	804,847	2,097,851
Households	23%	22%	1%	15%	38%	100%

HCV = Housing Choice Voucher.

Note: Percentages may not add to 100 due to rounding.

Sources: American Community Survey, 2013–2017; U.S. Department of Housing and Urban Development, Longitudinal Household Data, 1995–2017

Do HCV households who move experience improvements in tract opportunity levels?

Among the 2.4 million households in the HCV program in 2017, 48 percent moved from one tract to another at some time during the study period, 2010 to 2017. Among those movers, the data detail where they lived initially and where they lived in 2017. That feature of the data enables us to determine the opportunity index scores of the neighborhoods, categorized by quintiles before and after the move. Exhibit 7 tabulates whether those moves resulted in improved, reduced, or the same level of opportunity.

The largest group of movers (43 percent) chose tracts in the same opportunity quintile. About 31 percent moved to a tract offering at least one category higher in opportunity level, but 26 percent moved to a tract at a lower level of opportunity. Hispanics mirrored that pattern. Interestingly, non-Hispanic White HCV households were more likely than minority households to move to a lower level of opportunity. Non-Hispanic White HCV households experienced greater movement (32 percent) to lower opportunity tracts but also a larger movement (35 percent) to higher opportunity tracts. Blacks relocated in a pattern very close to that of Hispanics.

Exhibit 7

Housing Choice Voucher Households in 2017 who Moved
By Household Race and Ethnicity and Change in Tract Opportunity Level

Race/Ethnicity of HCV Household	Opportunity Category After Move			Total
	Moved to Higher Opportunity	Same	Moved to Lower Opportunity	
Non-Hispanic	69,811	67,322	64,013	201,145
White	35%	33%	32%	100%
Non-Hispanic	143,580	220,850	110,319	474,749
Black	30%	47%	23%	100%
Non-Hispanic	9,161	9,739	8,313	27,212
Other Race	34%	36%	31%	100%
Hispanic	36,185	52,571	29,911	118,666
Any Race	30%	44%	25%	100%
All Racial/Ethnic	258,736	350,481	212,555	821,772
Households	31%	43%	26%	100%

HCV = Housing Choice Voucher.
Note: Percentages may not add to 100 due to rounding.
Sources: American Community Survey, 2013–2017; U.S. Department of Housing and Urban Development, Longitudinal Household Data, 1995–2017

The pattern of movement suggests that some beneficial relocation is made possible by the HCV program, but movement to higher opportunity tracts is experienced by only about 30 percent of the participating households, independent of race. Sadly, movement to lower opportunity tracts is experienced by about one-fourth of the participating households.

Did HCV households move toward greater racial integration or remain in racially concentrated areas?

Exhibit 6 demonstrates that most households locate in a tract where their own racial or ethnic group is dominant. Exhibit 8 looks at movers in the HCV program to determine whether the program facilitates movement to integrated tracts or to other tracts where the racial and ethnic group of the household is dominant.

Overall, the 1.2 million households who moved relocated to tracts similar to that of their initial racial and ethnic distribution, but some moved to integrated tracts. More than one-half million households in the HCV program (43 percent) moved to a tract where their own racial or ethnic group is dominant. About 470,000 (41 percent) moved to integrated tracts, and more than 180,000 households (16 percent) moved to tracts where a different racial or ethnic group is dominant.

Hispanic HCV households showed the least movement to integrated tracts, at 37 percent, and trailed only White HCV households in locating to tracts where their own group is dominant. Only 16 percent of Hispanic movers moved to tracts dominated by a different racial or ethnic group.

Exhibit 8

Housing Choice Voucher Households in 2017 who Moved
By Household Race and Ethnicity and Change in Destination Tract Racial/Ethnic Composition

Race/Ethnicity of HCV Household	Racial/Ethnic Composition of Destination Tract Compared with Race/Ethnicity of Household: Same Group Dominant	Integrated	Different Group Dominated	Total
Non-Hispanic	157,880	122,254	29,906	310,040
White	51%	39%	10%	100%
Non-Hispanic	255,425	265,054	113,025	633,504
Black	40%	42%	18%	100%
Non-Hispanic	6,313	19,354	14,282	39,949
Other Race	16%	48%	36%	100%
Hispanic	86,036	65,499	27,620	179,155
Any Race	48%	37%	15%	100%
All Racial/Ethnic	505,654	472,160	184,834	1,162,648
Households	43%	41%	16%	100%

HCV = Housing Choice Voucher.
Note: Percentages may not add to 100 due to rounding.
Sources: American Community Survey, 2013–2017; U.S. Department of Housing and Urban Development, Longitudinal Household Data, 1995–2017

By comparison, non-Hispanic Black HCV households experienced slightly greater movement to integrated tracts (42 percent compared with 37 percent for Hispanics). About 18 percent of Black HCV households who moved relocated to tracts where some other racial or ethnic group dominated, compared with 15 percent for Hispanics.

Did Hispanic HCV households move toward greater racial integration or move to higher opportunity?

Exhibit 9 examines the movement of only Hispanic HCV households over the study period of 2010 to 2017. The table identifies the opportunity level of the tracts where the households lived initially and where they lived after moving.

About 61 percent of the Hispanic households who began in very low-opportunity tracts remained in that category after they moved. Remaining in very low-opportunity neighborhoods is not the desired outcome, but the results indicate that about 39 percent of Hispanics move up when a move is possible. Unfortunately, a little more than one-half of the households who move to tracts offering greater opportunity move up only one level, from very low to low opportunity. Although that movement is good, it is less than what might be expected or desired. Only 7 percent of the Hispanic mover households who began in very low-opportunity tracts moved to high- or very high-opportunity tracts. Additional research must be conducted to determine what contributed to that result for those households and what barriers prevented other households from achieving the same outcomes. The housing search patterns of households is not known. Did they attempt to find housing in neighborhoods offering greater opportunity but encounter barriers? Did they not search for housing in higher opportunity neighborhoods because they lacked information on housing in those areas? Household surveys could provide valuable information on the type of problems that inhibit movement to opportunity, which could help in the design of remedies.

Hispanic mover households who began in low- but not very low-opportunity tracts followed a different pattern. About 31 percent of the households stayed in low-opportunity tracts, and about 40 percent moved down to very low-opportunity tracts—neither result serving the goal of moving to high-opportunity neighborhoods. A significant share of Hispanic movers (12 percent) beginning in low-opportunity tracts, however, ended up in high- or very high-opportunity tracts.

Exhibit 9

Hispanic Housing Choice Voucher Households Who Moved
By Origin and Destination Tract Opportunity and Race/Ethnicity Categories (1 of 2)

Origin	Destination					
	Tract Opportunity Category					Total, All
Tract Opportunity Category	Very Low	Low	Moderate	High	Very High	Tracts
Very Low	37,616	13,522	5,987	3,361	1,110	61,596
	61%	22%	10%	5%	2%	100%
Low	11,249	8,726	4,641	2,560	874	28,050
	40%	31%	17%	9%	3%	100%
Moderate	4,620	4,291	3,228	2,294	803	15,236
	30%	28%	21%	15%	5%	100%
High	2,389	2,268	2,094	2,090	1,032	9,873
	24%	23%	21%	21%	10%	100%
Very High	695	718	729	857	910	3,909
	18%	18%	19%	22%	23%	100%
Total, All Tracts	56,569	29,525	16,679	11,162	4,729	118,664
	48%	25%	14%	9%	4%	100%
Origin	**Destination**					
	Tract Predominant Racial/Ethnic Group Non-Hispanic					
Tract Predominant Racial/Ethnic Group	**White**	**Black**	**Other**	**Hispanic**	**Integrated**	**Total, All Tracts**
Non-Hispanic	3,832	341	20	866	2,838	7,897
White	49%	4%	0%	11%	36%	100%
Non-Hispanic	387	3,741	34	1,607	957	6,726
Black	6%	56%	1%	24%	14%	100%
Non-Hispanic	27	29	566	336	128	1,086
Other Races	2%	3%	52%	31%	12%	100%
Hispanic	1,089	2,059	316	38,987	4,284	46,735
Any Race	2%	4%	1%	83%	9%	100%
Integrated	4,333	2,853	495	11,267	25,221	44,169
Tracts	10%	6%	1%	26%	57%	100%
Total, HCV	9,668	9,023	1,431	53,063	46,146	119,331
Households	8%	8%	1%	44%	39%	100%

HCV = Housing Choice Voucher.
Note: Percentages may not add to 100 due to rounding.
Sources: American Community Survey, 2013–2017; U.S. Department of Housing and Urban Development, Longitudinal Household Data, 1995–2017

Finally, in terms of origin and destination movement by opportunity, a very large share of Hispanic movers who began in high- or very high-opportunity tracts relocated to low- or very low-opportunity tracts, and relatively few remained in those tracts—something that the HCV program is designed to avoid. Again, more household-level survey research is needed to fully understand what is driving those relocation decisions.

Exhibit 9 also identifies the movement of Hispanic HCV households in terms of the dominant racial and ethnic population in both the origin and the destination tracts. The table suggests that Hispanic households tend to relocate to a tract with the same dominant group as found in the origin tract. Among those households that began in Hispanic-dominant tracts, more than four out of five remained in such tracts. Among those households that began in tracts with some other racial groups dominant, about one-half remained in tracts dominated by the same group. Households that began in integrated tracts displayed more movement. About one-half of those households remained in integrated tracts, and about 26 percent moved to predominantly Hispanic tracts.

What factors contribute to Hispanic HCV household movement to higher-opportunity tracts and to integrated tracts?

This tabular analysis does not control for the ranges of choice found in the markets where households start their participation in the HCV program or where they are at program end. We developed two logistic models to provide insights on the factors that influence movement of Hispanic and other HCV households into high- or very high-opportunity neighborhoods or into integrated neighborhoods. The first model estimates the influence of several variables on whether the HCV households who moved relocated into tracts with a higher level of opportunity than the tracts in which they started. The second model estimated the influence of several variables on whether the HCV households who moved from a predominantly minority tract ended up in racially or ethnically integrated tracts or predominantly White tracts (for non-Hispanic White HCV households, the analysis estimates their likelihood of moving to integrated tracts).

Previous research, highlighted in the literature review, suggests a variety of confounding variables for these models. First, although the focus of study is race and ethnicity of the household, the household type (family, elderly, or disabled) may also influence the ability to move to higher opportunity and to greater integration (Horn, Ellen, and Schwartz, 2014). Second, housing market conditions and location may influence the move. The region of the country may influence movement because of the higher incidence of Hispanic households in some states, especially in the south and the southwest. The states of California, Arizona, New Mexico, Texas, and Florida form a separate region given the high incidence of Hispanics in those states (Iceland and Nelson, 2008). Because states with large Hispanic populations may provide more ability for Hispanic households to access high-opportunity neighborhoods—especially if those neighborhoods are predominantly Hispanic—the logit models include a dummy variable that flags Hispanic HCV households that reside in those five states. Market tightness may influence the ability of HCV households to move freely (Early, 2011). Residing in a metropolitan area, especially a large metropolitan market, may offer more opportunities for movement to opportunity and movement to greater racial and ethnic integration (Din and Helms Garrison, 2021). Finally, the racial and ethnic composition of the destination census tracts may influence the probability of entering a higher level of opportunity (Turner et al., 2013). Similarly, the opportunity level of the destination census tract may influence the probability of entering an integrated tract.

Exhibit 10 describes the values of the independent variables employed in the estimation of the models. Non-Hispanic Black households make up the largest share of the households, at 58 percent. Hispanic households make up about 15 percent of movers, and about one-half of those movers live in one of the five states with a heavy Hispanic presence. As expected, 32 percent of movers moved to higher opportunity tracts, and 47 percent moved to racially or ethnically integrated tracts.

Exhibit 10

Predictors of Housing Choice Voucher Households Who Relocated Moving Up in Tract Opportunity Level and Moving to Integrated Tract or Predominantly White Tract (1 of 2)

Descriptive Statistics		Mean	Standard Deviation
	Household moved to–		
Dependent 1	Higher opportunity tract	0.315	0.464
Dependent 2	More racially and/or ethnically integrated tract	0.470	0.499
Independent Variables:			
HCV Household Variables			
Household race/ethnicity (reference is non-Hispanic White)			
	Hispanic	0.148	0.355
	Non-Hispanic Black	0.576	0.494
	Non-Hispanic Other	0.033	0.178
Household type (reference is non-elderly non-disabled)			
	Elderly household	0.163	0.369
	Disabled household	0.272	0.445
Market Controls			
Region (location in Arizona, California, Florida, New Mexico, Texas)		0.254	0.435
Tract is in metropolitan area		0.973	0.161
Tract rental vacancy rate		5.939	5.653
Tract dominant race/ethnicity (reference is non-Hispanic White)			
	Non-Hispanic Black	0.263	0.440
	Non-Hispanic Other	0.010	0.101
	Hispanic	0.134	0.341
	Integrated	0.406	0.491
Tract opportunity level (reference is very low opportunity)			
	Low opportunity	0.244	0.430
	Moderate opportunity	0.156	0.363
	High opportunity	0.105	0.306
	Very high opportunity	0.050	0.219

HCV = Housing Choice Voucher.

Sources: American Community Survey, 2013–2017; U.S. Department of Housing and Urban Development, Longitudinal Household Data, 1995–2017

Exhibit 11 provides the estimates for the two models. Neither model performs especially well, as both provide only modest capacity to predict whether a household will move. With nearly 1 million households in the dataset, however, all variables prove to be statistically significant at better than the .001 level, offering insights on the influence of the various independent variables in the context of the other confounding variables.

Exhibit 11

Predictors of Housing Choice Voucher Households Who Relocated
Moving Up in Tract Opportunity Level and Moving to Integrated Tract or Predominantly White Tract

Logistic Models						
Dependent Variable:	**Household Moved to Higher Opportunity Tract**			**Household Moved to More Racially and/or Ethnically Integrated Tract**		
	Estimate	**Significance**	**Odds Ratio**	**Estimate**	**Significance**	**Odds Ratio**
Independent Variables:						
HCV Household Variables:						
Household race/ethnicity (reference is non-Hispanic White):						
Hispanic	0.512	0.000	1.669	0.686	0.000	1.986
Non-Hispanic Black	0.538	0.000	1.713	0.818	0.000	2.266
Non-Hispanic Other	0.232	0.000	1.262	1.192	0.000	3.292
Household type (reference is non-elderly non-disabled):						
Elderly household	-0.073	0.000	0.930	-0.019	0.006	0.982
Disabled household	-0.129	0.000	0.879	0.074	0.000	1.076
Market Variables						
Region (reference is states other than Arizona, California, Florida, New Mexico, Texas)	0.296	0.000	1.345	-0.056	0.000	0.946
Tract is in a metropolitan area	0.300	0.000	1.350	0.255	0.000	1.291
Tract rental vacancy rate	0.008	0.000	1.008	-0.002	0.000	0.998
Tract dominant race/ethnicity (reference is non-Hispanic White):						
Non-Hispanic Black	-2.058	0.000	0.128			
Non-Hispanic Other	-0.612	0.000	0.542			
Hispanic	-1.995	0.000	0.136			
Integrated	-0.730	0.000	0.482			
Tract opportunity level (reference is very low opportunity):						
Low opportunity				0.907	0.000	2.476
Moderate opportunity				1.439	0.000	4.215
High opportunity				1.670	0.000	5.314
Very high opportunity				1.645	0.000	5.180
Intercept	-0.517	0.000	0.596	-1.682	0.000	0.186
Null model: Accurate prediction without model	68.5%			53.0%		
Model: Accurate prediction with model	69.9%			64.4%		
Model reduction of error:	4.4%			24.3%		

HCV = Housing Choice Voucher.

Sources: American Community Survey, 2013–2017; U.S. Department of Housing and Urban Development, Longitudinal Household Data, 1995–2017

The important test variable for each model is the coefficient for Hispanic households who move while in the HCV program. The first model explains the probability that an HCV household will, while in the program, move to a high- or very high-opportunity census tract. About one-third of the participating households made that move. Hispanic households as well as non-Hispanic Black and non-Hispanic Other households are more likely to move to higher opportunity tracts than the reference group, non-Hispanic White households. The second model explains the probability that an HCV household will move to an integrated or predominantly White census tract, supporting the goal of promoting racial or ethnic integration. Hispanic households are more likely to make that move than the reference group of non-Hispanic White households but less so than non-Hispanic Black households.

The various control variables provide mixed information. All parameter estimates are significant due to the very large sample size; however, although statistically significant, some of the parameters are very weak, but some make sizable contributions to the explanatory power of the models. For example, in both models, the elderly non-disabled households are less likely to move to higher opportunity and toward greater integration than are the non-elderly.

HCV households who move in the heavily Hispanic states are more likely to move to a higher opportunity census tract than HCV households in other states, with an odds ratio of 1.3. They are, however, less likely to move to a more racially or ethnically integrated tract, but with an odds ratio of .946, which is weak because it is so close to 1.0. If the HCV recipient lives in a metropolitan area, it seems to be beneficial to serving program goals. In both models, location in a metropolitan area is directly associated with beneficial movement of the household, with odds ratios of approximately 1.3. Market tightness provides mixed results. The rental vacancy rate is directly related to movement to higher opportunity, but with an odds ratio very close to 1.0, suggesting weakly that softer markets offer more opportunity to move to higher opportunity. The rental vacancy rate is inversely related to movement toward integration, opposite the expectation, but the odds ratio, although significant, is effectively 1.0.

The control variables provide interesting insights on movement to higher opportunity and movement toward integration. If the destination tract is predominantly minority of any type, the HCV household is less likely to move to higher opportunity, as would be expected given the very small numbers of minority-dominated tracts offering high- or very high-opportunity levels. In terms of moving toward integration, the higher the opportunity level of the tract, the higher the odds of making the move toward integration because the odds ratios grow as the destination tract offers increasingly higher opportunity levels.

Conclusions

This research examined the ability of the HCV program to help participating households move to tracts offering higher levels of opportunity and greater racial and ethnic integration, with special attention to Hispanic households.

Hispanics command a share of HCV resources that has been stable and proportionate to their share of the nation's households eligible for the HCV program, and Hispanic households are only slightly more likely than other households to move while in the program.

HCV households tend to be concentrated in low- or very low-opportunity tracts (69 percent), but Hispanic households are more concentrated, at 76 percent, a level comparable to that of Blacks, at 78 percent. HCV households also tend to be concentrated by race and ethnicity. The largest share of each racial and ethnic group is found within census tracts where that household group is dominant. Hispanics display this pattern more than any other minority group, with 51 percent of Hispanic HCV households living in predominantly Hispanic tracts. Hispanic HCV households are also the least likely to reside in integrated tracts.

When HCV households moved, a plurality (43 percent) remained in tracts of the same opportunity level. About 31 percent moved to a higher opportunity level, but 26 percent moved to a lower level. Relatively few movers ended up in high- or very high-opportunity tracts. Hispanics mirrored that pattern.

Just as the largest group of movers remained in census tracts within the same opportunity level, a plurality (43 percent) relocated to census tracts in which their race or ethnicity was dominant. A slightly smaller proportion (41 percent) moved to integrated tracts. Hispanics, however, showed the least movement to integrated tracts.

These results suggest that the HCV program has the capacity to help eligible low-income renter households move to neighborhoods offering higher levels of opportunity for better education, gainful employment, and reduced poverty exposure. Similarly, the HCV program has the capacity to help Black and Hispanic households locate in integrated neighborhoods. The program is not achieving those goals at particularly high levels, however. To the extent it achieves those goals at all, it does so without any specific mechanisms to promote such movement. The opportunity to lease housing virtually anywhere in the private market enables HCV households to reside in high-opportunity and integrated neighborhoods, but more often than not, that opportunity is not sufficient to achieve the desired outcomes.

If the HCV program is to better serve the goals of movement to opportunity and to affirmatively further fair housing, relying on the program as now administered seems insufficient. The HCV program offers the means for households to relocate, but the full potential of the program remains unachieved. HCV households would benefit from greater assistance in finding rental housing in neighborhoods that serve program goals, and they would benefit from greater initiatives to attract landlords offering high-quality housing into the program. Specifically, the HCV program would benefit from the expansion of the supply of rental units qualifying for participation in the program in high-opportunity, integrated areas. Efforts such as the Small Area Fair Market Rents serve this purpose (McClure and Schwartz, 2019). In addition, the program likely would better serve the goals of movement to opportunity and affirmatively furthering fair housing if the participating households were assisted in their search for housing. Housing counseling is needed to help all participating households, but especially Hispanic households for whom English is a second language. Skilled housing counselors can help the households learn of alternative housing options in the market and assist the household in navigating the negotiations of a lease. Finally, the twin goals of movement to opportunity and furthering fair housing will be better served with more participating landlords. HCV program administrators need the resources to actively seek out and entice more landlords to participate in the program. Those resources are also needed to protect landlords against the perceived risk of accepting voucher households.

Limitations of the Study

The neighborhood opportunity index does not include components indicating the level of crime in the neighborhood or the presence of environmental hazards, although these problems are known to correlate with poverty, unemployment, and educational attainment which are captured in the index. The data do not indicate whether households searching for units found willing or uncooperative landlords, nor do they indicate whether the households confronted any discrimination because of race, ethnicity, or use of a voucher. Data cannot indicate with certainty whether the final locations of the movers represent their true preference for a location, or a choice made among imperfect alternatives. Finally, the data on HCV participants do not distinguish between important differences within the Hispanic population, such as English proficiency, immigration status, and country of origin. Those limitations constrain what can be concluded from this analysis, and more research is needed to clarify those issues. Future studies should survey households engaged in their housing searches so as to uncover possible impediments to movement to opportunity and to affirmatively furthering fair housing.

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References

Acevedo-Garcia, Dolores, Nancy McArdle, Erin Hardy, Keri-Nicole Dillman, Jason Reece, Unda Crisan Ioana, David Norris, and Theresa L. Osypuk. 2016. “Neighborhood Opportunity and Location Affordability for Low-Income Renter Families,” *Housing Policy Debate* 26 (4–5): 607–645.

Arreola, Daniel, ed. 2009. *Hispanic Spaces, Latino Places: Community and Cultural Diversity in Contemporary America*. Austin, TX: University of Texas Press.

Basolo, Victoria, and Mai Thi Nguyen. 2005. “Does Mobility Matter? The Neighborhood Conditions of Housing Voucher Holders by Race and Ethnicity,” *Housing Policy Debate* 16 (3–4): 297–324.

Blumenberg, Evelyn, and Gregory Pierce. 2016. “The Drive to Work: The Relationship Between Transportation Access, Housing Assistance, and Employment Among Participants in the Welfare to Work Voucher Program,” *Journal of Planning Education and Research* 37 (1): 66–82.

Boyd, Melody L. 2008. "The Role of Social Networks in Making Housing Choices: The Experience of the Gautreaux Two Residential Mobility Program," *Cityscape* 10 (1): 41–63.

Cortes, Alvaro, Christopher E. Herbert, Erin Wilson, and Elizabeth Clay. 2007. "Factors Affecting Hispanic Homeownership: A Review of the Literature," *Cityscape* 9 (2): 53–91.

DeLuca, Stefanie, Holly Wood, and Peter Rosenblatt. 2019. "Why Poor People Move (and Where They Go): Reactive Mobility and Residential Decisions," *City & Community* 18 (2): 556–593.

Devine, Deborah J., Robert W. Gray, Lester Rubin, and Lydia B. Taghavi. 2003. *Housing Choice Voucher Location Patterns: Implications for Participant and Neighborhood Welfare*. Washington, DC: U.S. Department of Housing and Urban Development.

Din, Alexander, and Veronica Eva Helms Garrison. 2021. "The Geography of Hispanic HUD-Assisted Households," *Cityscape* 23 (2): 409–416.

Early, Dirk W. 2011. *Racial and Ethnic Disparities in Rents of Constant Quality Units in the Housing Choice Voucher Program: Evidence from HUD's Customer Satisfaction Survey*. Washington, DC: U.S. Department of Housing and Urban Development, Office of Policy Development and Research.

Ellen, Ingrid Gould. 2020. "What Do We Know About Housing Choice Vouchers?" *Regional Science and Urban Economics* 80 (January): Article 103380. https://doi.org/10.1016/j.regsciurbeco.2018.07.003.

Finkel, Meryl, and Larry Buron. 2001. *Study of Section 8 Voucher Success Rates, Volume 1: Quantitative Study of Success Rates in Metropolitan Areas*. Washington, DC: U.S. Department of Housing and Urban Development, Office of Policy Development and Research.

Galvez, Martha M. 2011. *Defining "Choice" in the Housing Choice Voucher Program: The Role of Market Constraints and Household Preferences in Location Outcomes*. Ph.D. diss., Wagner Graduate School of Public Service, New York University.

Garboden, Philip M. E., Eva Rosen, Stefanie DeLuca, and Kathryn Edin. 2018. "Taking Stock: What Drives Landlord Participation in the Housing Choice Voucher Program," *Housing Policy Debate* 28 (6): 979–1003.

Hanson, Andrew, and Michael Santas. 2014. "Field Experiment Tests for Discrimination Against Hispanics in the U.S. Rental Housing Market," *Southern Economic Journal* 81 (1): 135–167.

Horn, Keren Mertens, Ingrid Gould Ellen, and Amy Ellen Schwartz. 2014. "Do Housing Choice Voucher Holders Live Near Good Schools?" *Journal of Housing Economics* 23 (March): 28–40.

Iceland, John, and Kyle Anne Nelson. 2008. "Hispanic Segregation in Metropolitan America: Exploring the Multiple Forms of Spatial Assimilation," *American Sociological Review* 73 (5): 741–765.

Lens, Michael C., Ingrid Gould Ellen, and Katherine O'Regan. 2011. "Do Vouchers Help Low-Income Households Live in Safer Neighborhoods? Evidence on the Housing Choice Voucher Program," *Cityscape* 13 (3): 135–159.

Logan John R. 2013. "The Persistence of Segregation in the 21st Century Metropolis," *City & Community* 12 (2). https://doi.org/10.1111/cico.12021.

Massey, Douglas S., and Nancy A. Denton. 1987. "Trends in the Residential Segregation of Blacks, Hispanics, and Asians: 1970–1980," *American Sociological Review* 52 (6): 802–825.

Mast, Brent. 2015. "Measuring Neighborhood Opportunity with AFFH Data," *Cityscape* 17 (3): 221–230.

McClure, Kirk. 2010. "The Prospects for Guiding Housing Choice Voucher Households to High-Opportunity Neighborhoods," *Cityscape* 12 (3): 101–122.

———. 2006. "The Low-Income Housing Tax Goes Mainstream and Moves to the Suburbs," *Housing Policy Debate* 17 (3): 419–446.

McClure, Kirk, and Bonnie Johnson. 2014. "Housing Programs Fail to Deliver on Neighborhood Quality, Reexamined," *Housing Policy Debate* 25 (3): 463–496.

McClure, Kirk, and Alex Schwartz. 2019. "Small Area Fair Market Rents, Race, and Neighborhood Opportunity," *Cityscape* 21 (3): 49–69.

Newman, Sandra J., and Ann B. Schnare. 1997. "… 'And a Suitable Living Environment': The Failure of Housing Programs to Deliver on Neighborhood Quality," *Housing Policy Debate* 8 (4): 703–741.

Patterson, Kelly L., and Eun-Hye Enki Yoo. 2008. "Trapped in Poor Places? An Assessment of the Residential Spatial Patterns of Housing Choice Voucher Holders in 2004 and 2008," *Journal of Social Service Research* 38 (5): 637–655.

Pendall, Rolf. 2000. "Why Voucher and Certificate Users Live in Distressed Neighborhoods," *Housing Policy Debate* 11 (4): 881–909.

Pendall, Rolf, Christopher Hayes, Arthur George, Casey Dawkins, Jae Sik Jeon, Elijah Knaap, Evelyn Blumenberg, Gregory Pierce, and Michael Smart. 2015. "Driving to Opportunities: Voucher Users, Cars, and Movement to Sustainable Neighborhoods," *Cityscape* 17 (2): 57–88.

Rosen, Eva. 2020. *The Voucher Promise: "Section 8" and the Fate of an American Neighborhood*. Princeton, NJ: Princeton University Press.

Sard, Barbara, and Douglas Rice. 2016. *Realizing the Housing Voucher Program's Potential to Enable Families to Move to Better Neighborhoods*. Policy Futures report. Washington, DC: Center on Budget and Policy Priorities. https://www.cbpp.org/research/housing/realizing-the-housing-voucher-programs-potential-to-enable-families-to-move-to.

Schwartz, Alex, Kirk McClure, and Lydia B. Taghavi. 2016. "Vouchers and Neighborhood Distress: The Unrealized Potential for Families With Housing Choice Vouchers To Reside in Neighborhoods With Low Levels of Distress," *Cityscape* 18 (3): 207–227.

Tighe, J. Rosie, Megan E. Hatch, and Joseph Mead. 2017. “Source of Income Discrimination and Fair Housing Policy,” *Journal of Planning Literature* 32 (1): 3–15. https://doi.org/10.1177/0885412216670603.

Turner, Margery Austin, Rob Santos, Diane K. Levy, Doug Wissoker, Claudia Aranda, and Rob Pitingolo. 2013. *Housing Discrimination Against Racial and Ethnic Minorities 2012*. Washington, DC: U.S. Department of Housing and Urban Development.

U.S. Census Bureau. 2020a. Table B003002 Hispanic or Latino by Race. *2013–2017 American Community Survey 5-Year Estimates*. Washington, DC: U.S. Census Bureau.

———. 2020b. Table B019001 Household Income by Ethnicity and by Race, *2013–2017 American Community Survey 5-Year Estimates*. Washington, DC: U.S. Census Bureau.

U.S. Department of Housing and Urban Development. 1996. *Expanding Housing Choices for HUD Assisted Families: First Biennial Report to Congress, Moving to Opportunity for Fair Housing Demonstration*. Washington, DC: U.S. Department of Housing and Urban Development, Office of Policy Development and Research. https://www.huduser.gov/portal//Publications/pdf/HUD%20-%207157.pdf.

Wang, Ruoniu. 2018. “Tracking ‘Choice’ in the Housing Choice Voucher Program: The Relationship Between Neighborhood Preference and Locational Outcome,” *Urban Affairs Review* 54 (2): 302–331.

Wang, Ruoniu, and Rebecca J. Walter. 2017. “Tracking Mobility in the Housing Choice Voucher Program: A Household Level Examination in Florida, USA,” *Housing Studies* 33 (3): 455–475.

Hispanic Families in Assisted Housing

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Abstract

Using rich data, we establish a national profile of Hispanic families in assisted housing and compare this profile to that of non-Hispanic Black and White families. Through multivariate regression and decomposition analysis, we then estimate the effect of being Hispanic on the odds of receiving assistance and whether being Hispanic per se could explain Hispanic families' significantly lower chances of assistance receipt than their Black and White counterparts. The additional analysis estimates whether Hispanic families are receiving their "fair share" of housing assistance. We find significant disparities in the size of assisted housing units among Hispanics compared to Blacks and Whites. Being Hispanic lowers the odds of receiving housing assistance by about one-third relative to Blacks and Whites. Neither this disparity nor that in housing unit size is explained by measured characteristics of the three race and ethnic groups. Hispanic families represent one-third of income-eligibles in the three race and ethnic groups but 20 percent of assisted housing recipients. Across program types, Hispanics are over-represented in public housing and under-represented in the multifamily and voucher programs.

Hispanics are largely invisible in housing research. This is surprising given even basic demographic characteristics. Hispanics constitute nearly one-fifth of the population and account for more than half of population growth in the 2010 decade (Noe-Bustemante and Krogstad, 2020). Before the 2020 pandemic, the Hispanic poverty rate was 17 percent overall and 26 percent for children. The comparable national rates were approximately 11 percent and 16 percent, respectively (Creamer, 2020; Kaiser Family Foundation, 2019; National Center for Education Statistics, 2019; Semega et al., 2019).[1] Housing circumstances also are noteworthy. Roughly 52 percent of Hispanics spend more than 30 percent of their income on rent (Joint Center for Housing Studies [JCHS], 2020).

[1] The estimated Hispanic poverty rate varies slightly between Creamer (2020), who relies on the Current Population Survey Annual Social and Economic Supplement released in September 2020, and the Kaiser Family Foundation (2019), which relies on the 2019 1-year American Community Survey. The population and child poverty rates are based on the Current Population Survey.

About 24 percent of Hispanic households experience worst-case housing needs.[2] The prevalence of worst-case needs among very low-income Hispanics increased by more than 50 percent between 2007 and 2017—the largest increase of any group (Watson et al., 2020).[3]

Taken alone, these characteristics suggest robust demand among Hispanics for government housing assistance. But class action lawsuits against HUD, public housing authorities, and local jurisdictions on behalf of Hispanic plaintiffs[4] suggest problems in meeting that demand. Nonetheless, in 2017, then HUD Secretary Ben Carson announced the Administration's decision to retreat from vigorous enforcement of the Affirmatively Furthering Fair Housing rule under the Fair Housing Act.[5] The concentration of poor Hispanic families in high-rent cities that offer few private market, affordable housing options, and intense competition for assisted housing units is yet another concern. In December 2020, Hispanic households comprised about 13 percent of all U.S. households but often multiples of that fraction in 14 of the 15 highest-rent cities—Washington, D.C. is the exception. (See appendix exhibit A-1).

In this report, we use rich national data to develop a current profile of Hispanic households with children living in the nation's stock of HUD-assisted housing and examine how this profile compares with Black and White families with children receiving housing assistance.[6] This analysis focuses on the households' background attributes, assisted housing program type, and housing and neighborhood characteristics. Next, we estimate multivariate models of the odds of assisted housing receipt and an Oaxaca-Blinder style decomposition analysis to estimate the extent to which being Hispanic affects the likelihood of receiving assistance and, if so, whether being Hispanic influences whether the household lives in public housing, multifamily housing, or is using a voucher. Because we find notable differences in housing unit size, we apply the same type of decomposition analysis to examine whether being Hispanic has a notable effect on the size of the assisted housing unit the household occupies. We then estimate whether Hispanic families receive their "fair share" of housing assistance. These estimates address whether Hispanic households with children receive housing assistance at the same rate as their prevalence in the income-eligible population both nationally and by state.

Although a broad range of outcomes of assisted housing receipt is of great interest, sadly, no existing national data have sufficient numbers of Hispanic individuals or families to allow the analysis of outcomes.[7]

[2] Worst case needs are defined by the Department of Housing and Urban Development (HUD) as renters who do not receive government housing assistance who have incomes at or below 50 percent of the metropolitan area median income and who pay more than 50 percent of their income for rent, live in severely inadequate housing, or both (Watson et al., 2020). Worst case needs estimates are based on the 2017 American Housing Survey.

[3] Very low income is defined as income that does not exceed 50 percent of the metropolitan area median income.

[4] Examples include: *Open Communities Alliance v. Carson (2020), Vargas v. Town of Smithtown (2007)* and *Williamsburg Fair Housing commission v. New York City Housing Authority (1978)*.

[5] https://www.housingwire.com/articles/trump-administration-rolling-back-controversial-obama-fair-housing-rule/

[6] We refer to households with children and families interchangeably in this article.

[7] For example, existing national data cannot support the analysis of child outcomes such as cognitive achievement or social emotional adjustment by ethnic subgroup. Nor do existing national data allow analysis of long-term outcomes, such as the educational attainment, employment, and earnings during young adulthood of Hispanic children who lived in assisted housing during childhood. Although rich national panel datasets exist, the number of Hispanic families in the sample is too small or have not been tracked for a long enough time for this type of analysis.

We find the most dramatic disparity in assisted housing unit characteristics between Hispanic families and their Black and White counterparts is the size and likely crowding in the assisted housing unit. Across a range of measures from greater than two persons per bedroom to square feet per person, which accounts for substantial differences in household size, Hispanic families have significantly less space in their housing units. Being a Hispanic household with children also reduces the chances of receiving housing assistance by about one-third relative to Black and White families. This disparity, along with the disparity in unit size, is not explained by differences in the measured characteristics of the three race and ethnic groups. The fair share analysis shows that Hispanic families represent one-third of Hispanic, Black, and White households with children who are income-eligible for assistance, but 20 percent of Hispanic, Black, and White assisted housing recipients are Hispanic families. Across program types, Hispanic families are over-represented in public housing and under-represented in the multifamily and voucher programs.

In the next section, we review previous research on Hispanics and assisted housing. This is followed by discussing our research approach, including data, sample, statistical methods, and measures. We then present the current profile of household, program type, housing, and neighborhood characteristics of Hispanic families in assisted housing, how these features compare to those of Black and White assisted housing families, and whether Hispanic families currently receive their fair share of housing assistance. The final section summarizes the findings and discusses their interpretation and implications for future research and policy.

Previous Research

Housing research has largely overlooked the Hispanic population (Carrillo et al., 2016). The small body of work on Hispanics and housing focus on homeownership (e.g., Cortes et al., 2006) or neighborhood segregation (e.g., De La Roca, Ellen, and Stell, 2018), not assisted housing. Further, when Hispanics are included, they are often combined with Blacks into a minority category (e.g., Devine et al., 2003; Turner, 2003). The main obstacle to research on Hispanics is their small sample size in most studies. Even in major national surveys, including the National Longitudinal Survey of Youth and the Panel Study of Income Dynamics (PSID), Hispanics constitute less than 10 percent of the sample (Slopen, 2020).[8]

Prior research has explored two characteristics of Hispanic households with implications for housing needs, household size, and immigration status. Roughly 25 percent of Hispanics are members of five or more person households compared with 14 percent of Blacks and 10 percent of Whites.[9] Large household size could limit access to assisted housing if there is an insufficient supply of housing units with the number of bedrooms required to meet HUD housing quality standards and public housing authority (PHA) occupancy standards. Occupancy standards in local codes may also cause problems for large households seeking housing in the private market. In a particularly insidious example, Hispanics' large household size resulted in a 1996 Fair Housing complaint against

[8] The PSID added a supplementary sample of mostly Hispanic immigrants in 1997.

[9] https://www.statista.com/statistics/638956/race-and-ethnicity-of-us-households-by-size based on 2015 Census data.

Waukegan, Illinois. Waukegan was accused of tightening its crowding restrictions because of the growth in its Hispanic population (Yzaguirre, Arce, and Kamasaki, 1999).[10]

The second household attribute with housing implications is immigrant status. Carrillo and colleagues (2016) note that assisted housing eligibility restrictions for immigrants likely contribute to the underrepresentation of Hispanics in assisted housing. Hispanics who lack eligible immigration status can live in assisted housing only if another household member, such as a child, is a citizen. Subsidies are pro-rated to cover only eligible household members. This reduction in benefits could be a deterrent to seeking assistance.[11] Immigration status may also discourage applying for assistance because of fear of government scrutiny.

Beyond immigration status, Hispanic families may not seek assisted housing because they lack knowledge or because of cultural competency (Carrillo et al., 2016). Lack of knowledge may result from living in enclaves of Hispanics that may be disconnected from sources of information on housing programs. However, living in an enclave could either increase or reduce access by Hispanics to assisted housing. On the one hand, it is possible that networking and information sharing within the enclave could improve assisted housing access.[12] Enclaves may be insular, however, separating Hispanic families from the mainstream, including mastering English and learning about assistance programs and eligibility rules (Cortes et al., 2006; Endicott, 2015).

Concern about deterrents to seeking assisted housing underlies other studies of whether Hispanics receive their fair share of housing assistance. This issue was crystallized in the 1994 class-action lawsuit *Latinos United v. Chicago Housing Authority (CHA)*. This suit claimed that Hispanics were underrepresented in all of HUD's assisted housing programs operated by CHA. Although CHA signed the consent decree in 1996, its wording was vague, requiring CHA to increase its Hispanic tenants "significantly" (Olivo, 2006). CHA responded by earmarking 500 vouchers for Hispanic households. The decree expired in 2005. As of 2006, the main effects appear to be the 500 vouchers and an increase in Hispanic families living in scattered-site public housing (Olivo, 2006; Yzaguirre, Arce, and Kamasaki, 1999). After the decree expired, Hispanic participation rates declined. In 2015, the Latino Policy Forum estimated that 25 percent of Hispanic families were eligible for housing assistance compared to 19 percent living in either project-based housing or using vouchers. Some speculated there would be another lawsuit, but none has transpired to date (Endicott, 2015).[13]

The most recent estimates of the relative share of assisted housing occupied by Hispanics, Blacks, and Whites appear in Eggers (2020). Using ≤ 50 percent of area median income (AMI) as the

[10] Under the Consent Decree, Waukegan was prohibited from enforcing the restrictions and was required to pursue additional remedies. See https://www.justice.gov/crt/housing-and-civil-enforcement-cases-documents-543

[11] See https://www.law.cornell.edu/ctr/text/24/5.500 through 5.528. This is a HUD rule and is not left to the discretion of the housing authority. Other safety-net programs follow a similar rule. In 2019, the Trump administration and HUD proposed to disallow "mixed status" (covered by Section 214 of the Housing and Community Development Act of 1980) in assisted housing. This proposal was never finalized (Cueva-Dabkoski and Morris, 2019).

[12] See Kasinitz and Rosenberg (1996) on informal information sharing within tight-knit groups.

[13] To the extent that Hispanics are deterred from seeking assisted housing for any of these hypothesized reasons, this will affect the estimates of whether Hispanic families are receiving their fair share of housing assistance.

threshold for eligibility for assisted housing,[14] Eggers compares the fraction of renter householders[15] with eligible incomes in the population who are White, Black, and Hispanic to the fraction of assisted housing householders who are White, Black, and Hispanic. His sample includes all households, including those without children; race and ethnic groups are not defined in a mutually exclusive way (i.e., Blacks and Whites can also be Hispanic), and the income-eligible population "denominator" is limited to renters. He finds that Hispanics constitute roughly 23 percent of eligible renters—5 percentage points higher than the 18 percent of assisted housing householders who are Hispanic. The situation for Black householders is dramatically different. About 28 percent of renters who are income-eligible for housing assistance are Black, whereas 46 percent of householders in assisted housing are Black. Thus, of all assisted housing householders, Blacks comprise 64 percent more than would be expected by their representation in the population of income-eligible renters. The situation for Whites is nearly the opposite of that for Blacks.[16] Sixty-three percent of eligible renters are White compared with roughly 46 of assisted householders who are White. Thus, assisted housing receipt is about 20 percent lower than Whites' representation among income-eligible renter householders.

The assisted housing program that has attracted the most attention is the Housing Choice Voucher Program. Past studies focus mainly on the poverty level of the census tracts in which Hispanic voucher users reside. Using data from the 2000 Multifamily Tenant Characteristics System (MTCS) matched to 1990 Census data on the tract poverty rate for the 50 large Metropolitan Statistical Areas (MSA), Devine et al. (2003) report that nearly one in three Hispanic voucher households lived in a 30 percent or higher poverty-rate tract. This is the highest prevalence in high-poverty tracts across the three main race and ethnic groups. The comparable rates for non-Hispanic Black and non-Hispanic White voucher households were approximately 25 percent and 8 percent, respectively. At the other end of the tract poverty continuum, slightly more than one-fifth of Hispanic voucher households lived in less than 10 percent poverty tracts. This compares with nearly one-fourth of Blacks and almost 50 percent of Whites (Devine et al., 2003: Table III-3). These estimates are for all households, not only those with at least one child.

McClure, Schwartz, and Taghavi (2014: Table 6) replicate and update the Devine et al. (2003) voucher estimates. By contrast to Devine et al., the authors rely on national HUD administrative data for 2000 and 2010, not the 50 largest MSAs. The national data are linked to census tracts in the 2000 Census and the 2005–09 American Community Survey (ACS). For 2000, the authors revise downward the nearly 33 percent share of Hispanic voucher households living in 30 percent or higher poverty tracts by Devine et al. to about 27 percent. Likewise, they revise the share upward for non-Hispanic Blacks to about 28 percent and replicate the Devine et al. share of non-Hispanic Whites of about 8 percent. Thus, the McClure, Schwartz, and Taghavi (2014) estimates no longer show Hispanics to be the most likely to live in high-poverty tracts and, instead, have roughly the same prevalence in such tracts as non-Hispanic Blacks.

[14] Also referred to as Very Low Income or VLI.

[15] A householder is the first person listed in the household roster by the American Housing Survey (AHS) interviewer.

[16] Eggers (2020: p. 32-3) suggests that both Blacks and assisted housing units are more prevalent in central cities, which accounts for the high proportion of assisted housing units occupied by Blacks.

Estimates for 2010 are intriguing. In high poverty tracts, Hispanics and Blacks remain at roughly 28 percent, but the share of Whites roughly doubles to 16 percent. Prevalence rates in less than 10 percent poverty tracts in 2000 are lower across the board in McClure, Schwartz, and Taghavi relative to Devine et al. This is unexpected because the 50 largest MSAs contain the largest central cities in the United States and a substantial share of the nation's public housing, which would suggest a lower prevalence of recipients in low-poverty tracts. The 2014 McClure, Schwartz, and Taghavi paper estimates about 14 percent of Hispanics in low-poverty tracts, not the nearly one-fifth in the 2003 Devine et al. paper.

By 2010, the Hispanic share in the lowest-poverty tracts increased to nearly 16 percent, the non-Hispanic Black share increased from roughly 14 percent to nearly 17 percent, while the non-Hispanic White share fell from almost one-third to 27 percent. McClure, Schwartz, and Taghavi (2014) reported lower rates of minorities living in low-poverty tracts in central cities than in the suburbs, the opposite of non-Hispanic Whites. Interestingly, the share of minorities living in low-poverty tracts in the suburbs increased sizably between 2000 and 2010 in the largest 50 MSAs, whereas the share of non-Hispanic Whites in these tracts declined by about 8 percentage points (McClure, Schwartz, and Taghavi, 2014: Table 7). Similar to Devine and colleagues, McClure, Schwartz, and Taghavi do not focus on households with children.

The most recent update of housing voucher location patterns, along with those for public housing and project-based Section 8 (one type of multifamily housing), by race and ethnicity is Sard et al. (2018: Tables A-3 and A-4). Using HUD 2017 administrative data and 2012–16 ACS data for households with children, the authors estimate that across the three assisted housing program types considered, nearly 44 percent of Hispanic voucher households are located in 30 percent or greater poverty tracts. This compares with 47 percent for non-Hispanic Blacks and about 25 percent for non-Hispanic Whites. Unsurprisingly, given the historic concentration of public housing in central cities, the rates for public housing are substantially higher for all groups. The rates for vouchers are the lowest among the three programs, with multifamily rates falling between public housing and vouchers.

Sard et al. (2018) also provide the neighborhood poverty rates of children living in voucher-assisted housing by race and ethnicity. As expected, the child estimates are slightly higher for each demographic group than the household voucher rates because multiple children may live in one household. Roughly 36 percent of Hispanic children in voucher housing live in 30 percent or higher poverty neighborhoods. The rate for non-Hispanic Black children in voucher housing is 38 percent. It is about 28 percent for non-Hispanic White children.

Approach[17]

Data

The primary datasets for this research are the 2015 and 2017 national American Housing Surveys (AHS). The AHS samples in these years include the combination of a nationally representative sample of housing units including assisted housing units falling into that sample, metropolitan area samples of housing units including assisted housing units falling into the selected metro areas surveyed in that year, plus an over-sample of assisted housing units. We apply the AHS statistical weights to produce nationally representative estimates of assisted housing in our analysis sample (details in Technical Appendix). Each household with at least one child living in assisted housing in each survey year is treated as a separate observation to provide an accurate, contemporaneous picture of assisted households with children in each of the three race and ethnic groups that are our focus.[18] We rely on the AHS to construct a profile of background, program type, housing, and neighborhood attributes of Hispanic, non-Hispanic Black, and non-Hispanic White households with children and to compare Hispanics to each of the other two groups.

To provide a complete profile and comparative analysis, we rely heavily on the confidential internal use files (IUF) of the AHS.[19] Unlike the public use files, the IUF includes such data as unit square footage in continuous form, whether the unit is located in a central city, and geocodes for linking to census tract data. The IUF also allows us to differentiate between public housing and privately-owned, federally assisted housing, often referred to as "multifamily." Although these are both project-based programs, they differ in other respects. Importantly, public housing is administered by the local PHA and HUD. In contrast, although multifamily developments must comply with HUD rules and fall under the purview of HUD field offices, they are owned and managed privately. These differences could affect the profile of residents, housing units, and neighborhoods in each program type.

We use the AHS IUF geocodes to link observations in the analysis file to the census tracts they lived in as recorded in the 2014–18 ACS. This allows us to expand the neighborhood measures in the analysis, including the tract poverty rate and rate of racial segregation.

We rely on the 2015–17 combined AHS for the national portion of the fair share analysis. For the state-by-state portion, we use three 2017 databases: the Integrated Public Use Microdata Series (IPUMS) state data, HUD's Picture of Subsidized Households (hereafter called "Picture"), and the HUD Public Use Microdata Sample (PUMS). The IPUMS provides data on the poverty status of households with children and the ability to produce estimates at 130 percent of the federal poverty level, which approximates HUD's income eligibility threshold of 50 percent of AMI.[20]

[17] Additional details on construction of the analysis samples and data diagnostics (e.g., missing data) are in the Technical Appendix, which can be found on the Johns Hopkins Institute for Health and Social Policy website at https://www.jhsph.edu/research/centers-and-institutes/institute-for-health-and-social-policy/news-and-events/documents/hispanic-assisted-housing-cityscape-techapp-nov2021.pdf.

[18] Since the same household can appear twice—once in 2015 and again in 2017—we use robust standard errors in multivariate analysis.

[19] Because the 2019 AHS IUF had not been released at this writing. we relied on the 2015 and 2017 AHS files. We combined them to increase sample sizes. We treat each case from each wave as a separate observation, and we weight each case separately.

[20] IPUMS is, in part, a repository of Census and survey data directed by S. Ruggles at the University of Minnesota.

HUD's "Picture" provides data on HUD-assisted units by program type and state.[21] The HUD PUMS provides state-level household participation rates in assisted housing by race and ethnicity.[22] (We also used Picture data to confirm the accuracy of estimates of assisted housing units overall and by program in the HUD PUMS.)

Analysis Samples

To produce a contemporary profile of Hispanic households with children living in assisted housing and to conduct a comparative analysis of Hispanics compared with non-Hispanic Blacks and non-Hispanic Whites, the analysis sample includes all households in assisted housing with at least one child 18 years old or younger in one of these three race and ethnic groups.[23] The decomposition analysis includes households with children who receive housing assistance and their income-eligible counterparts who do not receive assistance.

For the fair share analysis, the most appropriate sample is all households with children who are income-eligible to live in assisted housing.[24] We rely on this sample for the national analysis using the AHS. For the state-by-state analysis, unfortunately, the IPUMS data limit our focus to all households, both with and without children, who are income-eligible for housing assistance.

Methods[25]

We rely on T-tests of bivariate difference in means in the comparative analysis of the background, housing, and neighborhood characteristics of the three race and ethnic groups central to this paper. We provide both p-values and effect sizes in the results tables. The p-value, or statistical significance, indicates whether the observed difference between two groups might be due to chance but does not measure the magnitude of the difference. For magnitude, we report the effect size calculated by dividing the absolute difference in means by the overall standard deviation. This yields an estimate of the magnitude of the difference as a proportion of the overall standard deviation of each measure.

Because Hispanic respondents subjectively rate their houses and neighborhoods significantly higher than either Blacks or Whites, we use ordinary least squares regression (OLS) to examine the main predictors of these ratings. To estimate the extent to which being Hispanic influences whether an income-eligible Hispanic family lives in assisted housing and, once in assisted housing, the program type, we use an Oaxaca-Blinder style decomposition. This approach allows us to estimate how much of the difference in the predicted outcome from the regression model of the likelihood

[21] Picture data cover public housing, vouchers, and the following multifamily programs: Project Based Section 8, Moderate Rehabilitation, Rent Supplement, Section 236, Section 202, and Section 811. We limit analysis to Project Based Section 8 for consistency with the HUD PUMS data, which we also use in the fair share analysis. Project-Based Section 8 comprises over 96 percent of the multifamily units included in the Picture database.

[22] See https://www.huduser.gov/portal/pumd/index.htm.

[23] Other racial and ethnic groups are excluded because the sample size for each is too small to support the analysis and combining them cannot be justified.

[24] Income-eligible families are those with incomes below 50 percent of AMI who are not receiving housing assistance.

[25] All monetary values are expressed in 2017 dollars.

that a household receives housing assistance is accounted for by observable differences between Hispanics versus Blacks and Whites—the explained differences—versus how much is attributable to the coefficients on these variables, that is, the unexplained differences (Blinder, 1973; Oaxaca, 1973).[26] As noted, the sample for the decomposition analysis includes households with children receiving housing assistance and income-eligible households who do not receive assistance. Because we find noteworthy differences in housing unit size between Hispanics and the other two demographic groups, we also use decomposition to examine whether being Hispanic helps explain the unit size disparity.

Measures

This analysis focuses on the three main types of assisted housing: public housing, Section 8 project-based assisted housing (referred to as multifamily), and vouchers.[27] We measure assisted housing both as a composite of the three programs combined and examine each program separately.

Background characteristics of households with at least one child 18 or younger include the head's race and ethnicity,[28] gender, age, marital status, educational attainment, employment status,[29] whether born in the United States, and duration of residence in the United States. Household measures include income, size, whether anyone in the household is disabled, and whether the household is multigenerational.

Housing features include both objective and normative measures. Objective measures include the number of units in the structure, multiple measures of space, and crowding (e.g., persons per room, persons per bedroom, square footage per person). More normative and subjective measures include several alternative approaches to measuring housing quality—these range from the AHS respondent's house rating to HUD's housing adequacy index.

Neighborhood measures also include objective and subjective variables from the AHS and census tract attributes collected by the Census Bureau. Objective neighborhood measures include neighborhood conditions such as abandoned buildings and buildings with bars on their windows. Subjective measures include the AHS respondent's assessment of neighborhood crime, schools, and trash in the streets. Census tract measures include the demographic and socioeconomic characteristics of tracts, a proxy for neighborhoods, including the poverty rate and rate of racial segregation. Following common practice, we define racial segregation by the fraction of Black individuals in the tract. A final set of measures distinguish among the central city, suburban, and rural locations.

[26] This decomposition analysis provides only an initial, admittedly crude assessment of whether demographic differences across the three race and ethnic groups may be driving the descriptive results.

[27] We exclude Section 811 supportive housing for persons with disabilities and Section 202 supportive housing for the elderly.

[28] Race and ethnicity are based on the household head as reported by AHS respondents. If "Hispanic" is reported, we treat the observation as Hispanic regardless of the race reported.

[29] The AHS does not ask about employment. Our proxy is whether the head reports wage or salary income.

Results

Profile and Comparative Analysis

Background characteristics. The first data column of the top segment of Table 1 shows the background characteristics of Hispanic households with children across all assisted housing programs at the end of the 2010 decade. To set the context, the first three measures show that roughly 29 percent of Hispanic families live in public housing, nearly 19 percent live in multifamily housing, and 52 percent use a housing voucher.

Nearly 90 percent of Hispanic heads of households are women, are 37 years old, on average, and roughly 20 percent are married. Household heads typically have at least a high school or GED diploma, and two-thirds are employed. The household has nearly four members, two of whom are children. Approximately 20 percent of Hispanic households with children in assisted housing have a disabled household member, and 6 percent are multigenerational.[30] The median household income is about $18,000, falling below the federal poverty level of $26,200 for an average family size of four.[31] Roughly 70 percent of households receive some form of safety net assistance (excluding housing assistance).

Nearly 68 percent of Hispanic families in assisted housing live in central cities, about 27 percent live in the suburbs, and 6 percent live in rural areas. Fifty-four percent of Hispanic household heads were born in the United States, and, on average, they have lived in the United States for more than 80 percent of their lives.

The remaining columns in exhibit 1 provide the same data on background attributes for non-Hispanic Black households with children and non-Hispanic White households with children. P-values are shown first to compare Hispanic households with Black households and next for Hispanic households compared with White households. Effect sizes are listed in the last two columns, showing Hispanic-Black differences first, followed by Hispanic-White differences. The majority of comparisons are statistically significant, but only a subset is substantively important. Hispanic families are significantly more likely to live in public housing than Black and White families (29 percent, 23 percent, and 20 percent, respectively). They are significantly less likely to receive multifamily housing assistance. However, the differences here are less than those for public housing (19 percent, 23 percent, and 22 percent, respectively). Similarly, the significant differences for the voucher program are also more modest than those for public housing (52 percent, 54 percent, and 58 percent, respectively). The relatively small magnitude of these differences is reflected in the generally low effect sizes.

[30] Defined as a household with three or more generations (e.g., grandparent, parent, and child).

[31] See https://aspe.hhs.gov/poverty-guidelines.

Exhibit 1

Background Characteristics of Hispanic, Black, and White Households with Children in Assisted Housing, by Program Type: 2015–17 (1 of 2)

				P-values, Hisp vs:		Effect Size, Hisp vs:	
	Hispanic	Black	White	Black	White	Black	White
Any Assisted Housing (N)	650	2,000	800				
Public Housing	29.3	23	20.1	***	***	0.148	0.216
Multifamily	18.7	22.6	22.4	*	+	– 0.094	– 0.090
Voucher	52.0	54.4	57.5		*	– 0.048	– 0.110
Head female	87.5	91.4	82.8	**	**	– 0.122	0.150
Head married	19.7	10.1	18.0	***		0.277	0.048
Head age	37.3	35.2	36.5	***	+	0.000	0.000
Hhld size	3.78	3.58	3.41	***	***	0.141	0.261
Number children in hhld	2.05	2.08	1.97			– 0.026	0.070
Multigenerational	6.0	4.6	1.7		***	0.075	0.218
Any disabled in hhld	19.9	19.0	32.3		***	0.019	– 0.298
Median hhld income	$18,000	$14,000	$13,000	***	***	0.359	0.532
Head education: <HS	38.0	18.6	17.7	***	***	0.466	0.488
Head education: HS/GED	23.2	35.7	32.7	***	***	– 0.266	– 0.202
Head education: some college	33.9	39.4	41.7	**	**	– 0.113	– 0.160
Head education: BA+	4.8	6.2	8.0		*	– 0.055	– 0.130
Hhld any safety net	69.5	72.1	80.3		***	– 0.060	– 0.245
Head employed	66.3	66.1	56.6		***	0.006	0.203
Yrs in unit	4.37	3.89	3.78	*	*	0.108	0.132
Central city	67.7	62.0	34.6	***	***	0.101	0.584
Suburb	26.5	29.5	41.3		***	– 0.095	– 0.467
Rural	5.8	8.5	24.1	*	***	– 0.230	– 1.571
Born in U.S.	54.5	93.6	94.4	***	***	– 0.456	– 0.465
Years in U.S.	29.0	33.7	34.8	***	***	– 0.142	– 0.175
Public Housing (N)	200	500	200				
Head female	85.1	91.4	79.3	*		– 0.190	0.175
Head married	26.7	9.3	12.1	***	***	0.498	0.418
Head age	34.8	34.8	33.9		*	0.000	0.100
Hhld size	3.97	3.45	3.50	***	**	0.375	0.339
Number children in hhld	2.24	2.00	2.14	*		0.211	0.088
Multigenerational	5.4	2.3	2.7	*		0.177	0.154
Any disabled in hhld	19.4	20.2	33.9		**	– 0.019	– 0.345
Median hhld income	$16,900.0	$12,200.0	$13,400.0				
Head education: <HS	48.7	16.9	17.2	***	***	0.736	0.728
Head education: HS/GED	19.9	40.3	25.0	***		– 0.435	– 0.109
Head education: some college	27.1	39.0	48.8	**	***	– 0.245	– 0.448
Head education: BA+	4.4	3.9	9.0		+	0.021	– 0.210
Hhld Any Safety Net	74.9	75.8	75.9			– 0.021	– 0.023
Head employed	67.6	66.3	68.2			0.028	– 0.013
Yrs in unit	3.76	4.99	2.71	***	***	– 0.286	0.244
Central city	74.8	69.1	34.6		***	0.118	0.835
Suburb	17.4	19.3	25.6		+	– 0.047	– 0.204
Rural	7.8	11.6	39.8		***	– 0.102	– 0.866
Born in U.S.	57.8	95.9	98.2	***	***	– 1.125	– 1.193
Years in U.S.	27.5	33.8	33.0	***	***	– 0.634	– 0.553

Exhibit 1

Background Characteristics of Hispanic, Black, and White Households with Children in Assisted Housing, by Program Type: 2015–17 (2 of 2)

				P-values, Hisp vs:		Effect Size, Hisp vs:	
	Hispanic	Black	White	Black	White	Black	White
Multifamily (N)	100	350	200				
Head female	84.1	90.7	78.9	*		– 0.194	0.153
Head married	14.7	10.4	21.9			0.124	– 0.208
Head age	36.8	32.3	34.7	***	+	0.477	0.222
Hhld size	3.42	3.21	3.16		+	0.158	0.195
Number children in hhld	2.00	2.00	2.00			0.000	0.000
Multigenerational	6.5	3.9	3.0			0.131	0.176
Any disabled in hhld	19.5	13.9	27.8		+	0.145	– 0.214
Median hhld income	$20,000.0	$15,500.0	$13,700.0	***	***		
Head education: <HS	44.5	19.2	17.0	***	***	0.601	0.652
Head education: HS/GED	28.6	39.3	43.1	*	**	– 0.221	– 0.299
Head education: some college	24.2	38.6	36.0	**	*	– 0.303	– 0.248
Head education: BA+	11.2	11.4	15.4			– 0.011	– 0.240
Hhld any safety net	66.7	74.9	81.0	+	**	– 0.189	– 0.330
Head employed	60.9	68.4	55.1			– 0.156	0.121
Yrs in unit	5.46	4.04	3.67	*	**	0.274	0.346
Central city	67.4	59.8	31.3		***	0.152	0.724
Suburb	21.2	30.0	53.3	+	***	– 0.185	– 0.676
Rural	11.3	10.3	15.4			0.031	– 0.127
Born in U.S.	34.6	89.4	91.8	***	***	– 1.381	– 1.442
Years in U.S.	25.7	29.7	32.0	***	***	– 0.380	– 0.599
Voucher (N)	350	1200	400				
Head female	90.2	91.7	85.5		+	– 0.050	0.156
Head married	17.5	10.3	18.5	***		0.209	– 0.029
Head age	38.3	36.6	38.0	***		0.197	0.035
Hhld size	3.81	3.78	3.47		***	0.021	0.235
Number children in hhld	2.06	2.21	1.99	*		– 0.126	0.059
Multigenerational	6.2	5.8	0.8		***	0.019	0.257
Any disabled in hhld	20.7	21.6	34.3		***	– 0.021	– 0.316
Median hhld income	$14,800.0	$13,110.0	$12,360.0	***	***		
Head education: <HS	29.7	19.2	18.1	***	***	0.259	0.284
Head education: HS/GED	23.2	32.4	31.3	***	*	– 0.199	– 0.176
Head education: some college	41.3	40.0	41.3			0.027	– 0.001
Head education: BA+	5.8	8.5	9.2	+	+	– 0.099	– 0.124
Hhld any safety net	67.4	69.4	81.6		***	– 0.045	– 0.316
Head employed	67.5	65.0	53.1		***	0.052	0.297
Yrs in unit	4.32	3.4	4.20	***		0.226	0.029
Central city	63.8	60.0	35.9		***	0.076	0.560
Suburb	33.5	33.6	42.2		*	– 0.002	– 0.182
Rural	2.7	6.4	21.9	**	***	– 0.127	– 0.653
Born in U.S.	59.7	94.3	94.0	***	***	– 1.050	– 1.041
Years in U.S.	30.9	35.3	36.4	***	***	– 0.387	– 0.484

BA = bachelors degree. GED = General Educational Development. HS = high school. hhld = household.
*Notes: P-values: *** < .001; ** < .01; * < .05; + < .10. Effect size = (Hispanic Mean - Black/White Mean) / Overall SD. Weighted percents, unweighted Ns. Blacks = non-Hispanic Blacks; Whites = non-Hispanic Whites. Employed = receives wages or salary income. Safety net = receives food stamps, public assistance or Supplemental Security Income (SSI). Multifamily = tenants in privately owned assisted housing. Median household income in 2017 dollars.*
Sources: 2015 and 2017 American Housing Survey Internal Use Files

Across many measures, the data reveal a picture of greater disadvantage among Whites in assisted housing than either Hispanics or Blacks. Despite the higher educational attainment of White household heads, fewest children, and smallest household size compared to either Hispanics or Blacks, White households with children have the highest rate of disability, the lowest rate of employed household heads, the lowest household median incomes, and the highest rate of safety net participation. By contrast, Hispanic families are the least likely of the three groups to have this level of disadvantage.

Hispanics are nearly twice as likely to be married as Blacks. The roughly one-fifth of Hispanics who are married is almost double the fraction of Blacks but nearly the same as Whites (18 percent). The difference in marital status between Hispanics and Blacks is more than one-quarter of a standard deviation.

Hispanic and Black households with at least one child are three times as likely to have three or more generations living under the same roof compared with Whites (6, 5, and 2 percent, respectively). The Hispanic versus White difference is more than one-fifth of a standard deviation.

Another striking distinction that divides Hispanics and Blacks, on the one hand, compared with Whites, on the other, is the prevalence of a household member with disabilities. Whites are over 50 percent more likely to have a household member with disabilities than Hispanics or Blacks (32 percent among Whites, and roughly 20 percent for Hispanics and Blacks). The Hispanic versus White difference is large, at more than one-third of a standard deviation.[32]

Hispanic and Black households in assisted housing also share a similar distribution across central city, suburban, and rural locations compared with Whites. Among Hispanics and Blacks, more than 60 percent live in assisted housing located in central cities, nearly 30 percent live in the suburbs, and 6–9 percent reside in rural areas. For Whites, the distribution across these locations is flatter: 35 percent in central cities, 42 percent in the suburbs, and 24 percent in rural areas. The effect size for the comparison of Hispanics and Whites in central cities is 0.58 and for rural areas is larger than a standard deviation (1.57).

Across the three main measures of financial well-being—income, receipt of safety net assistance, and whether the household head is employed—Whites are consistently worse off than either Hispanics or Blacks. Hispanics' household median income is nearly 40 percent higher than that of Whites and nearly 30 percent higher than that of Blacks. Hispanic incomes are more than one-half a standard deviation higher than Whites (nearly $18,000 versus $13,000, respectively).[33] The difference in safety net participation between Hispanics and Whites (70 percent for Hispanics, 81 percent for Whites) has an effect size of one-fourth of a standard deviation. Roughly two-thirds of household heads in Hispanic and Black families report being employed, compared to about 57 percent of Whites. The Hispanic-White difference is one-fifth of a standard deviation.

[32] Whites are much more likely to have a disabled head of household and a disabled household member other than the head. This difference between Hispanics and Whites reaches nearly one-third of a standard deviation (see Technical Appendix).

[33] Effect size based on differences in mean household incomes. Mean and median incomes have similar distributions, with Hispanics at the top and Whites at the bottom.

The second through fourth segments of exhibit 1 display background attributes for the three race and ethnic groups by program type. The differences across programs do not present a coherent pattern, either by demographic group or program type. Therefore, we limit ourselves to a few stylized observations.

Hispanics in public housing are most likely to be married (27 percent) compared to the other two programs and compared to Blacks and Whites. The marriage rate falls by nearly half in multifamily (15 percent) housing, and it is also much lower in the voucher program (17 percent). Roughly three in four Hispanic households with children in public housing rely on assistance from safety-net programs despite only modest declines in income and employment relative to their average across all three programs.

Among Blacks, the median income is about 25 percent higher in multifamily housing (nearly $16,000) than in either public housing or the voucher program (~$12,000–$13,000). Nonetheless, Blacks in public and in multifamily housing have the highest rates of safety net reliance (75 percent) relative to vouchers (69 percent). Employment rates are roughly similar across all three programs. Rates of having a disabled household member are similar (~20–21 percent) for Black households in public housing and vouchers and considerably lower in multifamily housing (14 percent).

For Whites, the median income is roughly similar across programs ($12,000–$13,000). There is a somewhat greater reliance on safety net programs in the voucher and multifamily programs than in public housing, but this reliance never falls below 76 percent. Despite similar median incomes and heavy reliance on the safety net, the employment rate for Whites is highest in public housing (68 percent), whereas it is similar in the multifamily and voucher programs (54 percent). Rates of households with a household member with disabilities are the same in public housing and voucher programs (34 percent) and somewhat lower in multifamily housing (28 percent). The public housing and multifamily housing estimates provide a cautionary note about combining these two forms of assistance into a single project-based category. Doing so may produce misleading results.

The distribution of Hispanic, Black, and White families across central city, suburban, and rural locations by program type is very similar to that observed earlier for all housing assistance programs combined. That is, regardless of assisted housing program, the majority of Hispanics and Blacks live in central cities, with suburbs no more than one-half as likely and rural areas three or more times less likely. The percentage of assisted housing families in rural areas is in the single digits except for those in multifamily housing programs, reaching 10–11 percent. Although more than 60 percent of Hispanics and Blacks in the voucher program live in central cities, this is the only program in which as much as one-third of each group lives in the suburbs. Almost none of the differences between Hispanic and Black locations are statistically significant. The location of Whites in the three program types also generally hews to their overall averages across all programs combined. However, at least three features of the location pattern of White families in assisted housing programs are rarely acknowledged and worth noting. First, only slightly more than one-third of White families in public housing live in central cities (35 percent; effect size compared to Hispanics = 0.84). Second, the largest share of Whites living in the suburbs participate in the multifamily program. This 53 percent share (effect size compared to Hispanics = 0.67) is 11 percentage points greater than the suburban share in the voucher program (42 percent), which is the housing program typically viewed as a potential conduit to the suburbs. And third, nearly one-fourth of White families in assisted housing live in rural areas. This rate grows to nearly 40 percent in the public housing program (effect size relative to Hispanics = 0.87), falls to 15 percent in multifamily housing, and reaches about 22 percent in the voucher program.

Housing characteristics. Starting with the top segment of exhibit 2, the first data column provides the profile of the housing characteristics of Hispanic households with children living in assisted housing. Roughly 36 percent of assisted Hispanic families live in single-family homes, and about 10 percent live in structures containing 50 or more apartments. Of those living in multi-unit structures, more than 85 percent have two to three bedrooms, with 10 percent having four or more bedrooms. On average, their housing units include about five rooms. Using the traditional measure of crowding, more than one person per room, about 8 percent of Hispanic households are crowded. The fraction who are crowded is nearly the same when measured by the HUD standard of more than two persons per bedroom. Arguably, a stronger measure of crowding is square footage per person because even a small space can be divided into multiple rooms, giving the numerical illusion of adequate space when, in fact, the household is crowded. Hispanic households are living in units that average 1025 square feet (SD = 430) and 305 square feet per person (SD = 168).[34]

Exhibit 2

Housing Characteristics Of Hispanic, Black, and White Households with Children in Assisted Housing, by Program Type: 2015–17 (1 of 2)

				P-values, Hisp vs:		Effect Size, Hisp vs:	
	Hispanic	Black	White	Black	White	Black	White
Any Assisted Housing (N)	650	2000	800				
# Units in building:							
1 Unit	36.1	43.2	44.3	***	***	– 0.145	– 0.166
2–4 Units	26.6	22.5	26.4	*		0.096	0.006
5–19 Units	23.2	23.0	23.0			0.004	0.004
20–49 Units	3.8	4.6	4.0			– 0.037	– 0.009
50+ Units	10.3	6.7	2.4	**	***	0.146	0.323
Median rooms	5.0	5.0	5.0				
Sq footage per person	304.6	340.1	347.4	***	***	– 0.230	– 0.277
Person per room > 1	8.1	6.4	5.7		+	0.069	0.097
Person per bedroom > 2	8.7	4.8	3.0	***	***	0.175	0.255
Total square footage	1025.1	1116.1	1098.3	***	*	– 0.202	– 0.163
Public Housing (N)	200	500	200				
# Units in building:							
1 Unit	42.3	35.0	35.2	+		0.151	0.147
2–4 Units	15.9	29.5	44.2	***	***	– 0.296	– 0.616
5–19 Units	20.4	18.1	19.4			0.059	0.025
20–49 Units	0.0	3.1	0.9	**		– 0.227	– 0.066
50+ Units	21.4	14.3	0.2	*	***	0.538	1.606

[34] A continuous square footage measure is only available in the AHS IUF. It has a substantial amount of missing data: 41.7 percent for Hispanics, 47 percent for Blacks, and 33.7 percent for Whites. However, an analysis of respondents and non-respondents to the square footage question in each race and ethnic group reveals no systematic pattern of differences between respondents and non-respondents. The possible exception is that White voucher holders are significantly more likely to respond than not (see Technical Appendix).

Exhibit 2

Housing Characteristics Of Hispanic, Black, and White Households with Children in Assisted Housing, by Program Type: 2015–17 (2 of 2)

	Hispanic	Black	White	P-values, Hisp vs: Black	P-values, Hisp vs: White	Effect Size, Hisp vs: Black	Effect Size, Hisp vs: White
Median rooms	5.0	5.0	5.0				
Sq footage per person	264.9	471.7	307.7	***	*	– 0.508	– 0.105
Person per room > 1	7.7	3.6	4.6	*		0.191	0.145
Person per bedroom > 2	6.0	0.8	0.0	***	***	0.378	0.436
Total square footage	978.0	1637.0	973.0	**		– 0.401	0.003
Multifamily (N)	100	350	200				
# Units in building:							
1 Unit	11.4	19.9	28.8	*	***	– 0.210	– 0.430
2–4 Units	28.0	22.2	21.4			0.138	0.157
5–19 Units	46.9	43.5	39.0			0.069	0.159
20–49 Units	7.2	7.8	5.9			– 0.023	0.050
50+ Units	6.5	6.7	5.0			– 0.008	0.062
Median rooms	5.0	4.0	5.0				
Sq footage per person	309.6	328.2	332.6			– 0.145	– 0.179
Person per room > 1	7.1	6.3	6.4			0.032	0.028
Person per bedroom > 2	8.1	8.7	5.1			– 0.022	0.112
Total square footage	950.0	924.0	989.0			0.079	– 0.119
Voucher (N)	350	1200	400				
# Units in building:							
1 Unit	41.5	56.4	53.5	***	***	– 0.298	– 0.240
2–4 Units	32.1	19.6	22.1	***	***	0.299	0.239
5–19 Units	16.2	16.5	18.0			– 0.008	– 0.048
20–49 Units	4.8	3.9	4.4			0.045	0.020
50+ Units	5.4	3.5	2.1		*	0.103	0.178
Median rooms	5.00	5.0	5.00				
Sq footage per person	365.3	374.50	386.4			– 0.024	– 0.055
Person per room > 1	8.6	7.5	5.8			0.042	0.108
Person per bedroom > 2	10.4	4.9	3.3	***	***	0.240	0.310
Total square footage	1163.0	1344.0	1253.0			– 0.107	– 0.053

*Notes: P-values: *** < .001; ** < .01; * < .05; + < .10. Effect size = (Hispanic Mean - Black/White Mean) / Overall Standard Deviation. Weighted percents, unweighted Ns. Blacks = non-Hispanic Blacks; Whites = non-Hispanic Whites.*

Sources: 2015 and 2017 American Housing Survey Internal Use Files

The remainder of exhibit 2 provides comparative housing characteristic estimates for Blacks and Whites. The most striking disparities pertain to units per building, housing unit size, and crowding. Hispanics are significantly less likely to live in single-family homes than Blacks or Whites (36 percent for Hispanics, 43 percent for Blacks, and 44 percent for Whites). At the other end of the spectrum, Hispanics are significantly more likely to live in buildings containing 50 or more apartments than Blacks or Whites (10, 7, and 2 percent, respectively). Despite their statistical significance, the small absolute differences are not meaningful, and effect sizes for each difference are generally small.

The fraction of units that are deemed crowded (more than one person per room, and even more so by more than two persons per bedroom) is far higher for Hispanic households than for either of the other groups. Using the more sensitive bedroom measure, Hispanic households with children are nearly twice as likely as their Black counterparts and nearly three times as likely as their White counterparts to be considered crowded. The difference between Hispanics and Whites is approximately 0.26 of a standard deviation, generally accepted as a mid-sized effect.

The square footage measures also reveal sizable and significant differences between Hispanics compared to Blacks and Whites. On average, across assistance programs, Hispanics' housing units are 73 square feet smaller than those of Whites (1025 versus 1098, respectively) and 93 square feet smaller than those of Blacks (1025 versus 1116, respectively). Although differences in household size could explain these disparities, this explanation doesn't fit the present case since Hispanic households are, on average, significantly larger than those of the other two groups. Consequently, the square footage per person comparisons again show Hispanics with the least space: 305 for Hispanics, 340 for Blacks, and 347 for Whites. These disparities may arise because a sizable share of Hispanics, Blacks, and Whites may not live in the same housing markets. Markets differ in their supply of HUD-assisted housing and affordable housing units in the private stock that accommodates Hispanic families' larger household size. Disparities may also occur if a Hispanic household's size increases after the family move into assisted housing. Although the PHA or multifamily housing manager may attempt to relocate families who have increased in size since taking occupancy to larger units, in many cases, it will not happen quickly or may not even be possible given the dearth of units that accommodate large households.

The rest of exhibit 2 provides estimates of housing characteristics for each race and ethnic group in each of the three assisted housing programs. Here, again, the variation between Hispanics and both Blacks and Whites centers on space and crowding and possibly the greater privacy of properties with four or fewer housing units, including single-family homes.

More than one-fifth of Hispanics live in 50 or more unit buildings in public housing compared to about 14 percent Blacks. The fraction for Whites is essentially zero (0.2 percent). At the opposite end of the distribution, about four in five Whites live in a 1-4 unit public housing property, far greater than the 58 percent of Hispanics (and 65 percent of Blacks).

Nonetheless, by sharp contrast to the voucher and multifamily programs, public housing is the one program where Hispanics are more likely than Blacks or Whites to live in single-family homes. More than 40 percent of Hispanics in public housing live in single-family structures, about 7 percentage points higher than either Blacks or Whites. The divergence between Hispanics relative to Blacks and especially to Whites in the number of units in the structure persists in the multifamily and vouchers programs. In multifamily housing, only 11 percent of Hispanic families occupy single-family units, which is 9 percentage points less than Blacks (20 percent, an effect size of 0.21 of a standard deviation) and 18 percentage points less than Whites (29 percent an effect size of 0.43 of a standard deviation). The greatest disparity is in the voucher program. Roughly 42 percent of Hispanic families live in single-family dwellings compared to 56 percent of Blacks (effect size of 0.30) and 54 percent of Whites (effect size of 0.24).

By far, the most striking discontinuities between Hispanics and the two other race and ethnic groups pertain to space and crowding. Regardless of the program, Hispanics report the smallest square footage per person of the three groups. The situation is worst in public housing. Hispanics have 265 square feet per person (SD = 125) compared to 472 square feet SD = 138) for Blacks, with an effect size of half a standard deviation, and 308 square feet (SD = 134) for Whites (effect size = 0.10). In multifamily housing, square feet per person for Hispanics is about 310 (SD = 159). While smaller than the 328 square feet (SD = 126) for Blacks and the 333 square feet (SD = 107) for Whites, the differences are not statistically significant. The variation is of roughly the same scale in the voucher program: 365 (SD=188) for Hispanics, 374 (SD=161) for Blacks, and 386 (SD=162) for Whites (p =.10). Scanning the estimates for unit square footage clarifies that household size plays a major role in the differences across race and ethnic groups. The disparities in unit size are not large or statistically significant in either the public housing or multifamily programs, though they are both large and significant in the voucher program. Using 1,000 square feet as a cut point, there is nearly an even split of units above and below 1,000 square feet in the public housing program, a 35-percent (1,000 square feet plus) versus a 65-percent (<1,000 square feet) split in multifamily housing, and a 40-percent versus a 60-percent split in the voucher program (see appendix). Across the three programs, vouchers increase the chances of living in a larger than average unit, public housing offers an even chance, and multifamily housing decreases the chances of living in a larger than average unit.

To further explore what is driving the smaller unit sizes and square footage per person in assisted housing units occupied by Hispanic families, particularly compared to Blacks but also Whites, we estimated two ordinary least squares (OLS) regression models, one for each of these square footage measures controlling for 1,0 whether Hispanic (1=Hispanic, 0=Otherwise) and several measures that plausibly affect these dependent variables (e.g., central city location, number of units in the building).[35] Household size significantly increases housing unit size by about 111 square feet, while central city location and being Hispanic significantly decrease both total square footage and square footage per person. Being Hispanic reduces the unit size by 99 square feet and reduces square feet per person by 35. Next, we use Oaxaca-Blinder decomposition to examine whether the characteristics of Hispanic families drive the variation in unit size or square feet per person compared to Blacks and Whites. In the total square footage analysis, Hispanics are not benefiting from the larger units enjoyed by Blacks and Whites with large households. Given their characteristics, Hispanic households would be expected to have slightly larger housing units and equal square footage per person than Blacks and Whites. Instead, their units are 85 square feet smaller and provide 58 fewer square feet per person. These disparities do not arise because of measurable characteristics of Hispanics that differ significantly from those of Blacks and Whites. Two possible interpretations of this result are that either unmeasured characteristics are associated with being Hispanic, or there is something about being Hispanic *per se* that drives the outcome of smaller housing units and less square footage per person (analysis details in Technical Appendix).

The results for more than two persons per bedroom also typically show greater crowding among Hispanics, although the prevalence rates are relatively low. In public housing, 6 percent of

[35] We included household size in the unit size prediction but not in the square feet/person prediction since it is already part of the dependent variable.

Hispanics are in this category, essentially six times greater than either Blacks (0.8 percent) or Whites (0 percent). The effect sizes of these disparities range between 0.38–0.43 of a standard deviation. In multifamily housing, only about 1 percentage point separates Hispanics (8 percent) and Blacks (9 percent). But only 5 percent of Whites report crowding of this sort. None of these differences is statistically significant. The pattern for the voucher program resembles public housing, with 10 percent of Hispanics reporting more than two persons per bedroom relative to 5 percent of Blacks and 3 percent of Whites. Effect sizes here are in the 0.24–0.31 range of a standard deviation. Disparities in the broader measure of crowding of more than one person per room are similar to the bedroom measure, with public housing and the voucher program revealing the greatest variation between Hispanic families and their Black and White counterparts.

Another dimension of housing is its physical condition, soundness, and maintenance—often referred to as housing quality. We test four approaches to tapping housing quality, with the resulting four measures highly correlated at .094 or higher:[36] (1) *House Rating:* The respondents' response to the question: "On a scale of 1–10 (worst to best), how would you rate your unit as a place to live;" (2) *HUD's Upkeep Problems:* Based on AHS questions about the maintenance and repair of the unit and structure. A higher rating indicates more upkeep problems; (3) *HUD's Housing Adequacy Index:* Based on multiple AHS questions about housing systems and physical conditions including electrical, heating, plumbing, pests, leaks, and mold. A higher rating indicates more adequacy issues; and (4) *Housing Problems Index:* Based on our modeling of the 10-point house rating using 36 measures of housing quality. A higher rating indicates more problems.

The results are shown in exhibit 3. Because index values are easier to interpret through comparisons, we dispense with an initial profile of Hispanic families. The greatest variation in the table is in the "house rating" measure. Hispanics consistently rate their housing unit significantly higher than either Blacks or Whites. This is the case even in public housing, where they have significantly more housing adequacy problems than Blacks (1.25 for Hispanics versus 1.11 for Blacks, with an effect size of 0.32 of a standard deviation). This suggests the possibility that social desirability bias affects Hispanic responses. Further support for this interpretation is the pattern of responses in multifamily housing. All three race and ethnic groups have largely similar scores across all housing quality measures. Curiously, the disparity in house rating scores between Hispanics and Blacks or Whites is smallest among voucher households. Yet, in the voucher program, Hispanics consistently have fewer upkeep and adequacy problems than the other groups and significantly so compared to Blacks.

[36] Detailed descriptions of how we created measures 2–4 are provided in the Technical Appendix to this article.

Exhibit 3

Housing Quality of Hispanic, Black, and White Households with Children in Assisted Housing, by Program Type: 2015–17

				P-values, Hisp vs:		Effect Size, Hisp vs:	
	Hispanic	Black	White	Black	White	Black	White
Any Assisted Housing (N)	650	2,000	800				
House rating	7.74	7.07	7.03	***	***	0.299	0.317
HUD upkeep problems	1.06	1.10	1.06	*		– 0.132	0.000
HUD adequacy problems	1.15	1.16	1.11		+	– 0.023	0.093
Housing problems index	1.90	2.20	1.93	*		– 0.092	– 0.009
Public Housing (N)	200	500	200				
House rating	7.57	6.76	6.40	***	***	0.342	0.495
HUD upkeep problems	1.10	1.08	1.07			0.068	0.101
HUD adequacy problems	1.25	1.11	1.18	***		0.320	0.160
Housing problems index	2.39	2.32	2.34			0.021	0.015
Multifamily (N)	100	350	200				
House rating	8.07	6.73	7.05	***	***	0.590	0.449
HUD upkeep problems	1.06	1.11	1.05			– 0.170	0.034
HUD adequacy problems	1.14	1.21	1.09			– 0.150	0.107
Housing problems index	2.10	2.19	1.81			– 0.029	0.093
Voucher (N)	350	1200	400				
House rating	7.72	7.33	7.25	**	**	0.181	0.219
HUD upkeep problems	1.05	1.10	1.07	**		– 0.161	– 0.064
HUD adequacy problems	1.09	1.16	1.10	**		– 0.172	– 0.025
Housing problems index	1.55	2.16	1.84	**		– 0.186	– 0.089

*Notes: P-values: *** < .001; ** < .01; * < .05; + < .10. Effect size = (Hispanic Mean - Black/White Mean) / Overall SD. Weighted percents, unweighted Ns. Blacks = non-Hispanic Blacks; Whites = non-Hispanic Whites. House rating: "Rating of unit as a place to live," 1 = low, 10 = high. HUD upkeep: Defined by HUD from 1 (<3 problems) to 3 (5+ problems). See Technical Appendix. HUD adequacy: Defined by HUD from 1 (Adequate) to 3 (Severely inadequate). See Technical Appendix. Housing problems index based on 36 structural and physical problems. See Technical Appendix.*

Sources: 2015 and 2017 American Housing Survey Internal Use Files

To explore the possibility of response bias further, we estimated a multivariate model predicting house rating using selected background characteristics (e.g., gender, household size), measures of crowding (e.g., more than two persons per bedroom, square footage per person), the housing problems index and 1,0 whether Hispanic. The results show that being Hispanic is the largest predictor by far of house rating. Being Hispanic increases house rating by almost 1 point. This provides some credence to the hypothesis of a social desirability response bias among Hispanic respondents. (Results shown in Technical Appendix.)

Neighborhood characteristics. We use two sources of data to describe the assisted housing neighborhoods occupied by Hispanic households with children. We begin with self-reports by respondents to questions asked by the AHS interviewer. We then turn to characteristics of the census tracts in which AHS Hispanic households live. These tract features come from the 2014–18 American Community Survey (ACS), linked via geocodes to the main AHS analysis dataset.

Exhibit 4 shows responses to neighborhood questions in the AHS. The first data column in the top segment of the table provides the profile of Hispanic families. Their high neighborhood rating parallels their high house rating just viewed in exhibit 3, again suggesting possible social desirability bias. These high ratings align with their responses to questions about several specific features of the neighborhood. Large majorities of Hispanics give high ratings to their neighborhood schools (83 percent) and public transportation (79 percent), while a relatively modest 12 percent indicate that there are abandoned buildings nearby. But they do not align with other responses: 23 percent report nearby buildings have bars on the windows, and roughly one-quarter (26 percent) report serious crime in the neighborhood.

Exhibit 4

Neighborhood Characteristics of Hispanic, Black, and White Households with Children in Assisted Housing, by Program Type: 2015–17 (1 of 2)

				P-values, Hisp vs:		Effect Size, Hisp vs:	
	Hispanic	Black	White	Black	White	Black	White
Any Assisted Housing (N)	650	2,000	800				
Neighborhood rating	7.31	6.74	6.84	***	***	0.227	0.187
Good schools	83.0	76.8	80.9	***		0.152	0.052
Serious crime	25.6	30.1	20.8	*	*	– 0.101	0.108
Petty crime	44.0	47.5	41.7			– 0.070	0.046
Bldgs w/bars on windows	22.9	17.6	8.1	**	***	0.143	0.399
Abandoned buildings	12.1	19.8	13.3	***		– 0.206	– 0.032
Trash	23.5	22.2	23.0			0.031	0.012
Good public transportation	78.7	71.7	56.3	***	***	0.152	0.486
Near businesses	59.7	52.3	42.2	***	***	0.148	0.350
Near factories/industry	14.7	9.6	6.7	***	***	0.170	0.267
Public Housing (N)	200	500	200				
Neighborhood rating	6.98	6.06	5.93	***	***	0.332	0.379
Good schools	94.6	74.1	75.0	**	*	0.486	0.465
Serious crime	36.6	40.4	26.7		*	– 0.079	0.205
Petty crime	52.7	57.6	48.3			– 0.098	0.088
Bldgs w/bars on windows	23.4	24.6	6.4		***	– 0.030	0.420
Abandoned buildings	11.7	21.0	15.2	**		– 0.245	– 0.092
Trash	31.6	29.6	28.4			0.044	0.070
Good public transportation	81.1	69.5	46.7	**	***	0.248	0.735
Near businesses	68.9	53.2	44.2	***	***	0.316	0.497
Near factories/industry	16.2	14.1	9.9		+	0.061	0.183
Multifamily (N)	100	350	200				
Neighborhood rating	6.95	6.37	6.83			0.250	0.052
Good schools	82.6	77.2	77.9	*		0.136	0.118
Serious crime	23.6	36.0	17.8	*		– 0.300	0.140
Petty crime	41.6	55.7	40.3	**		– 0.288	0.027
Bldgs w/bars on windows	23.4	17.6	6.1		***	0.163	0.486
Abandoned buildings	8.3	18.4	9.5	*		– 0.267	– 0.032
Trash	20.3	24.3	19.0			– 0.101	0.033
Good public transportation	76.0	68.6	64.9		*	0.162	0.243
Near businesses	42.1	52.3	43.3	+		– 0.204	– 0.024
Near factories/industry	10.3	9.1	6.2			0.042	0.144

Exhibit 4

Neighborhood Characteristics of Hispanic, Black, and White Households with Children in Assisted Housing, by Program Type: 2015–17 (2 of 2)

				P-values, Hisp vs:		Effect Size, Hisp vs:	
	Hispanic	Black	White	Black	White	Black	White
Voucher (N)	350	1200	400				
Neighborhood rating	7.62	7.19	7.16	**	**	0.170	0.182
Good schools	82.3	77.8	84.2	+		0.109	– 0.046
Serious crime	20.1	23.4	19.9			– 0.072	0.004
Petty crime	39.9	40.0	39.9			– 0.002	0.000
Bldgs w/bars on windows	22.5	14.6	9.5	***	***	0.217	0.356
Abandoned buildings	13.7	19.9	14.1	**		– 0.176	– 0.011
Trash	20.0	18.2	22.7			0.043	– 0.065
Good public transportation	78.5	73.9	56.4	+	***	0.099	0.478
Near businesses	60.9	52.0	41.0	**	***	0.178	0.398
Near factories/industry	15.5	8.0	5.7	***	***	0.267	0.349

*Notes: P-values: *** < .001; ** < .01; * < .05; + < .10. Effect size = (Hispanic Mean - Black/White Mean) / Overall SD. Weighted percents, unweighted Ns. Blacks = non-Hispanic Blacks; Whites = non-Hispanic Whites. Neighborhood rating: "Rating of neighborhood as a place to live," 1 = low, 10 = high. All neighborhood features coded dichotomously (no problems=0; otherwise 1).*

Sources: 2015 and 2017 American Housing Survey Internal Use Files

The comparative analysis again shows that Hispanic respondents give higher ratings to their neighborhood than either Blacks or Whites. This is consistent with Hispanics' lower rate of reporting abandoned buildings in the neighborhood than Blacks (12 percent for Hispanics, 20 percent for Blacks, with an effect size of 0.21). But Whites report a similar rate of abandoned buildings in the area, 13 percent, and their overall neighborhood rating is significantly lower than that of Hispanics. It is also consistent with the nearly 79 percent of Hispanics who consider public transportation in the area to be good, significantly higher than Whites (56 percent).[37] Similarly, more than 83 percent of Hispanics report that neighborhood schools are good, significantly higher than the 77 percent of Blacks who reported good schools. Whites' rate of 81 percent is roughly similar to the rate for Hispanics.

On the other hand, it is inconsistent with their significantly higher rate of reports of bars on the windows of buildings in their neighborhood (23 percent for Hispanics, 18 percent for Blacks, with an effect size of 0.14, and 8 percent for Whites with a large effect size of 0.40). It is also inconsistent with Hispanics' higher rate of living near factories. Although only 15 percent report this attribute, this rate is twice that of Whites (7 percent) and 50 percent higher than Blacks (10 percent). Hispanics also have significantly higher rates of living near businesses (60 percent for Hispanics, 52 percent for Blacks, and 42 percent for Whites). Living near businesses may not be problematic, but living near factories and industry is more likely to be.

About 26 percent of Hispanics report serious crime in the neighborhood. This rate is significantly higher than the 21 percent rate for Whites but a bit lower than the 30 percent for Blacks. However, in each case, the effect size is small at 0.10 of a standard deviation compared to both Blacks and Whites.

[37] Although the difference between Hispanics (79 percent) and Blacks (72 percent) is statistically significant, this difference is small and not substantively meaningful.

Differences across programs vary with no obvious pattern. Compared to Whites, concerns among Hispanic families in public housing include higher rates of reporting serious crime (27 percent versus 37 percent, respectively), bars on the windows of buildings in the neighborhood (6 percent versus 23 percent, respectively), and proximity to businesses (44 percent versus 69 percent, respectively). Perhaps because a large share of Whites lives in suburban and rural areas, they are much less likely to view public transportation in the neighborhood as good compared to Hispanics (47 percent versus 81 percent, respectively; effect size = 0.74). Ratings by Hispanics and Blacks are more in sync. When they are not, Blacks' ratings connote more negative perceptions of neighborhood characteristics.

Multifamily housing presents the fewest neighborhood problems for Hispanic families, at least relative to Blacks and Whites. All statistically significant differences compared to Blacks reveal fewer problems for Hispanics. The only issue in Hispanics' multifamily neighborhoods compared to other demographic groups is bars on the windows of area buildings. The rate for Hispanics (23 percent) is nearly four times the rate for Whites (6 percent, with an effect size of nearly 0.50 of a standard deviation). In this context, it is worth noting that Hispanics and Whites have approximately the same rate of reports of abandoned buildings (8 percent for Hispanics and 10 percent for Whites).

In the voucher program, Hispanic families report three negative neighborhood characteristics at higher rates than Blacks, Whites, or both: bars on windows of neighboring buildings compared to both Blacks and Whites (23 percent for Hispanics, 15 percent for Blacks, and 10 percent for Whites), located near factories or industries (16 percent for Hispanics, 8 percent for Blacks, and 6 percent for Whites), and located near businesses (61 percent for Hispanics, 52 percent for Blacks, and 41 percent for Whites).

As with house rating, we again estimated a multivariate model predicting neighborhood rating. Predictors include 1,0 whether Hispanic, background measures, and several neighborhood measures from both self-reports (e.g., bars on windows of neighborhood buildings) and tract characteristics (e.g., poverty rate, median rent). The coefficient on whether Hispanic is large and statistically significant. Being Hispanic increases neighborhood rating by about 0.41 of a point (see Technical Appendix.) This result supports the social desirability response bias hypothesis among Hispanic respondents, although it is weaker here than it is for house rating.

The second source of information about the neighborhoods surrounding the assisted housing units occupied by Hispanic, Black, and White households with children is census tract data from the 5-year 2014–2018 ACS. In contrast to exhibit 4, which shows self-reported neighborhood features that were asked about in the AHS, and where there are relatively few meaningful differences among race and ethnic groups, the differences across groups in the large share of tract characteristics are both statistically significant and substantively important.

In the first segment of exhibit 5, the first data column provides the tract profile of Hispanic households with children in assisted housing. Interestingly, these households live in census tracts where, on average, nearly 50 percent of the residents are Hispanic (48 percent). Roughly 17 percent of the residents are Black, and about 28 percent are White. Note that the rate for an often-used catch-all category, "non-White," indicates that Hispanics live in tracts where 72 percent of the residents are not White (in other words, minorities). This hides the intriguing observation that, on average, Hispanic families in assisted housing live in tracts with nearly three times the fraction of Hispanics than of Black residents.

Exhibit 5

Census Tract Characteristics of Hispanic, Black, and White Households with Children in Assisted Housing, by Program Type: 2015–17

				P-values, Hisp vs:		Effect Size, Hisp vs:	
	Hispanic	**Black**	**White**	**Black**	**White**	**Black**	**White**
Any Assisted Housing (N)	650	2000	800				
% White	27.9	31.3	70.5	*	***	– 0.109	– 1.367
% Black	16.8	45.8	10.1	***	***	– 0.962	0.222
% Hispanic	47.8	15.8	11.9	***	***	1.296	1.453
% Non-white	72.0	68.7	29.5	**	***	0.106	1.364
% Population < poverty	25.9	28.4	20.3	***	***	– 0.173	0.386
Median family income	$53,420	$49,170	$57,900	***	***	0.173	-0.182
Median house value	$255,200	$175,400	$160,500	***	***	0.485	0.575
Median rent	$1,027	$892	$839	***	***	0.409	0.570
Public Housing (N)	200	500	200				
% White	25.6	28.6	72.3		***	– 0.094	– 1.459
% Black	18.4	52.5	14.5	***	+	– 1.087	0.124
% Hispanic	49.4	12.7	7.3	***	***	1.474	1.691
% Non-white	74.3	71.4	27.7		***	0.094	1.503
% Population < poverty	31.2	36.5	25.5	**	***	– 0.305	0.328
Median family income	$48,000	$41,990	$49,670	**		0.225	– 0.062
Median house value	$253,900	$183,700	$126,400	***	***	0.334	0.607
Median rent	$909	$727	$695	***	***	0.550	0.646
Multifamily (N)	100	350	200				
% White	36.3	33.6	66.4		***	0.088	– 0.981
% Black	15.7	47.4	11.0	***	*	– 1.046	0.155
% Hispanic	41.9	12.9	14.7	***	***	1.298	1.218
% Non-white	63.7	66.4	33.6		***	– 0.087	0.974
% Population < poverty	25.0	30.5	19.8	***	***	– 0.410	0.388
Median family income	$51,660	$47,460	$58,130		**	0.183	– 0.281
Median house value	$228,400	$173,000	$154,300	***	***	0.416	0.557
Median rent	$931	$819	$800	***	***	0.415	0.486
Voucher (N)	350	1200	400				
% White	26.2	31.5	71.5	***	***	– 0.172	– 1.466
% Black	16.3	42.3	8.3	***	***	– 0.890	0.274
% Hispanic	49.1	18.3	12.4	***	***	1.213	1.445
% Non-white	73.7	68.5	28.5	***	***	0.169	1.473
% Population < poverty	22.4	24.2	18.6	*	***	– 0.148	0.312
Median family income	$57,050	$52,890	$60,700	**	*	0.177	– 0.155
Median house value	$265,600	$172,800	$174,800	***	***	0.605	0.592
Median rent	$1,128	$992	$905	***	***	0.420	0.689

*Notes: P-values: *** < .001; ** < .01; * < .05; + < .10. Effect size = (Hispanic Mean - Black/White Mean) / Overall SD.3. Weights percents, unweighted N's. Blacks = non-Hispanic Blacks; Whites = non-Hispanic Whites. Family income, house value, and rent in 2017 dollars.*
Sources: 2015 and 2017 American Housing Survey Internal Use Files linked to 2014–2018 American Community Survey Census Tract data

Hispanic families also live in tracts with an average tract poverty rate of 26 percent (that is, where about 26 percent of the residents in the tract have incomes below the poverty line).[38] The median income of households in the tracts occupied by Hispanic assisted housing families is $53,400. On the one hand, this is more than double the poverty line income for a family of four in 2017 of roughly $25,000.[39] On the other hand, it is about 70 percent of the nation's median income in 2017, which was $61,372 (Fontenot, Semega, and Kollar, 2018). The median house value in the census tracts is $255,200, about 9 percent higher than the $235,000 nationwide median in 2017.[40] Median rent nationwide in 2017 was $1,043,[41] about 2 percent higher than the tract median rent of $1,027. These high values and rents align with the sizable share of Hispanics located in high-priced markets.

The remaining data columns in this first segment of exhibit 5 provide comparisons to non-Hispanic Back and White households with children. Among Blacks, the fraction of Black residents in the tract averages about 46 percent. Thus, both Hispanics and Blacks live in census tracts where nearly half of residents are of the same race and ethnicity as their own. Hispanics and Blacks also live in tracts with comparable fractions of Whites (28 percent and 31 percent, respectively). As a result, the fraction of Blacks in tracts where Hispanic households live, 17 percent, and of Hispanics in tracts where Blacks live, 16 percent, are also nearly identical. By contrast to Hispanics and Blacks, White assisted households with children live in tracts where 71 percent of the residents are also White. Presumably, this is closely associated with the fact that 66 percent of White families in assisted housing live in suburban or rural areas (see exhibit 1). The fraction of Blacks in these tracts averages about 10 percent, and the fraction of Hispanics averages about 12 percent.

Further detail on the degree of racial segregation in assisted housing census tracts across the three race and ethnic groups demonstrates that Black households with children live in assisted housing units that are located in the most racially segregated tracts (see appendix exhibit A-3).[42] More than 60 percent of Blacks live in tracts where 30 percent or more residents are Black. Plausibly, this occurs because a large proportion of public and multifamily housing is located in largely Black tracts. Among Hispanics, 23 percent live in assisted housing in such racially segregated tracts. The share for Whites is 8 percent.

Blacks resemble Hispanics in the average poverty rate in the census tract (28 percent for Blacks and 26 percent for Hispanics). For White assisted households with children, the mean tract poverty rate is lower, 20 percent. The Hispanic versus White disparity yields a relatively large effect size of 0.39 of a standard deviation.

These means hide considerable variation for those in tracts with at least a 30 percent poverty rate or at least a 40 percent poverty rate (see appendix exhibit A-2). Roughly 35 percent of Hispanics live in assisted housing units located in tracts with 30 percent or greater rates of poverty compared

[38] Other measures often used as indicators of disadvantage, percent female head, and percent unemployed, have the same pattern as poverty. Interestingly, educational attainment in the tract is roughly identical for all three groups. See Technical Appendix.

[39] See aspe.hhs.gov and search for 2017 poverty guidelines: $24,600 for four persons.

[40] www.attomdata.com Home Sales Report 2017.

[41] https://www.deptofnumbers.com/rent/us, U.S. Residential Rent and Rental Statistics.

[42] Racial segregation is defined by the share of Black residents to be consistent with the segregation literature.

with 43 percent of Black assisted housing households. The rate for White families in high poverty tracts is much lower, at 16 percent.

Consistent with Whites living in lower poverty tracts, the median income in these tracts is $57,900, roughly $4,500 higher than the tracts where Hispanic households live (effect size = 0.18). Tracts where Black households live have the lowest median income at $49,170.

Curiously, median house value and median rent in the tract tell a different story than the poverty rate and median income. As already noted, Hispanic assisted housing households with children live in tracts with relatively high median house values and rents. The comparative analysis demonstrates that these prices are significantly higher than the prices for either Whites or Blacks. These differences yield large effect sizes—0.49 and 0.58 for the comparison to Blacks and Whites, respectively. In these instances, Whites' tracts have the lowest house values and rents of the three race and ethnic groups, whereas Hispanics have the highest. While Blacks fall between the two groups, their tract values and rents are closer to Whites at the low end than to Hispanics at the high end. As noted, the greater share of lower-income Hispanics in high-price and high-rent tracts compared to Blacks and Whites may be at work here.

Variations across the three race and ethnic groups by program type are shown in the rest of exhibit 5. Although the estimates change, the pattern across Hispanics, Blacks, and Whites is generally consistent with the overall averages for the three types of assisted housing combined. Nonetheless, a few estimates diverge from the overall pattern. The average poverty rate in the tract is highest for public housing for all three groups, and the groups maintain their same rank order of Blacks (37 percent), Hispanics (31 percent), and Whites (25 percent) as the average tract poverty rate across all assisted housing. Unsurprisingly, the differences are far more dramatic when comparing tracts with more than 30 percent poverty (see appendix exhibit A-2). For all three race and ethnic groups, there is a roughly 30 percentage point disparity between public housing and vouchers. For Hispanics, 50 percent living in public housing are located in tracts with a poverty rate of 30 percent or more compared to the 25 percent in such high poverty tracts who use a voucher.[43] A final observation on exhibit 5 is that for Hispanic families, the highest proportion of White residents in the tract, 36 percent, occurs in the multifamily program. This is roughly 10 percentage points higher than either public housing or the voucher program. This variation across program types in the share of White residents is larger for Hispanics than for Black assisted housing families.

There is only modest variation across program types in the fraction of Hispanics living in highly segregated tracts where at least 30 percent of the residents are Black (27 percent for public housing, 25 percent for multifamily housing, and 21 percent for vouchers; see appendix exhibit A-3). Black households with children are most likely to live in highly race-segregated tracts: 72 percent of Blacks living in public housing, 60 percent living in multifamily housing, and 57 percent using vouchers. By far, White households have the lowest prevalence of living in tracts with

[43] At the other end of the continuum, the largest share of Hispanics and Blacks in less than 20 percent poverty tracts is in the voucher program, followed by multifamily. For Hispanics, the difference between vouchers and multifamily housing is small, suggesting that both programs provide access to low-poverty neighborhoods. This is even more the case for Whites, where vouchers and multifamily housing are essentially equivalent in offering low- poverty tracts. This feature of multifamily housing was also found by Lens and Reina (2016).

a high degree of Black segregation. Whites' rates are 14 percent for public housing, 9 percent for multifamily housing, and 6 percent for vouchers.

All three groups achieve the lowest tract poverty rates in the voucher program: Hispanics and Blacks at 22 and 24 percent, respectively, and Whites at 19 percent. The voucher program is also associated with the highest tract median house values experienced by Hispanics ($265,600) of the three program types. Finally, all groups experience the highest tract median rents in the voucher program. The pattern of variation remains the same: median rents for the groups are $1,128 for Hispanics, $992 for Blacks, and $905 for Whites.

Modeling the Chances of Receiving Housing Assistance. We use multivariate modeling to explore whether Hispanic households with children have a better, worse, or equal chance of receiving housing assistance than the two other race and ethnic groups considered here. The models control for several background and geographic characteristics that are plausibly associated with the likelihood of assistance receipt, such as household size and whether the household lives in a central city, suburb, or rural area, along with a binary measure of whether the household is Hispanic. We estimate four models, one for the three assisted housing programs combined and three additional models, one for each of the three program types. We use a logistic specification because the dependent variables are heavily skewed toward zero, particularly for the separate program type models.

Results are summarized in exhibit 6. To simplify interpretation, we convert the logit coefficients to odds ratios. Starting with the first data column for all assisted programs combined, it is worth noting that the estimated fraction of households receiving any housing assistance is 24 percent, consistent with administrative data indicating that about 25 percent of income-eligibles receive housing assistance. Even after controlling for background and locational attributes (central city, suburb, rural) that are likely to affect housing assistance receipt, Hispanic households with children have substantially lower odds—roughly two-thirds lower—of receiving housing assistance than their race and ethnic counterparts. Their odds improve to 50 percent, or one-half the chance of other groups for public housing, and they are about 70 percent lower for multifamily housing and vouchers. Except for the household head's age, all other covariates in the combined assistance receipt model are statistically significant and operate in the expected direction. There is some variation in significance across program types, but rarely in direction.[44]

[44] The exception is that a household with a disabled household member reduces the odds of participating in the multifamily program.

Exhibit 6

The Odds of Receiving Housing Assistance, 2015–17

Logistic Regression Models								
	Any Assisted Hsng		Public Housing		Multifamily		Voucher	
N	9,000		6,300		6,100		7,400	
Pseudo R2	0.095		0.077		0.086		0.100	
	O.R.	**p-value**	**O.R.**	**p-value**	**O.R.**	**p-value**	**O.R.**	**p-value**
Head female	3.36	0.000	2.98	0.000	2.29	0.000	4.17	0.000
Head age	1.01	0.172	0.99	0.239	0.98	0.007	1.02	0.000
Household size	0.90	0.000	0.91	0.032	0.73	0.000	0.97	0.321
Head disabled	1.17	0.080	1.27	0.091	0.98	0.897	1.17	0.137
Household income	1.01	0.000	1.01	0.100	1.01	0.219	1.02	0.000
Head employed	0.71	0.000	0.84	0.157	0.63	0.001	0.70	0.000
Suburb	0.53	0.000	0.31	0.000	0.60	0.000	0.61	0.000
Rural	0.69	0.003	0.90	0.549	0.69	0.129	0.59	0.001
Hispanic	0.34	0.000	0.46	0.000	0.32	0.000	0.30	0.000

O.R. = Odds ratio.

Notes: Unweighted N's, weighted logistic models. Odds ratio = exp (logistic coefficient). Samples include cases receiving housing assistance plus households with children eligible to receive housing assistance (income below 50% area median income [AMI]).

Sources: 2015 & 2017 American Housing Survey Internal Use Files

The logit models predicting receipt of housing assistance strongly suggest that either unobserved attributes of Hispanic individuals, or possibly simply being Hispanic *per se*, substantially reduces the likelihood of assisted housing receipt relative to Blacks and Whites. To further investigate which of these explanations is most likely, we decompose the variance in whether the household receives housing assistance to estimate how much of the difference in assisted housing receipt between Hispanics versus Blacks and Whites is explained by differences in the characteristics of these groups (explained variance) and how much is attributable to differences in the relationship between these characteristics and housing assistance receipt for Hispanics compared with Blacks and Whites (unexplained variance).

The results are summarized in exhibit 7 and pertain to the three main housing assistance programs combined. Across the three programs combined, the model predicts that roughly 12 percent of Hispanic households with children receive housing assistance compared with about 31 percent for Blacks and Whites, more than double the rate for Hispanics.[45]

[45] Most of the differences in the analysis are driven by differences between Hispanics and Blacks. We have combined Blacks and White households to simplify the discussion.

Exhibit 7

Decomposition: Likelihood of Any Assisted Housing Receipt

N	9000	*p*-value		
Hisp Predicted	0.123	0.000		
Non-Hisp Predicted	0.309	0.000		
Difference	– 0.177	0.000		
Explained	– 0.015	0.011		
Unexplained	– 0.163	0.000		
% Unexplained	0.921			
	Explained		**Unexplained**	
	Coeff	***p-value***	***Coeff***	***p-value***
Head female	– 0.019	0.000	0.023	0.268
Head age	0.001	0.193	0.066	0.132
Hhld size	– 0.007	0.002	– 0.094	0.008
Head disabled	– 0.001	0.109	0.005	0.312
Household income	0.006	0.000	0.046	0.004
Head employed	– 0.001	0.153	0.018	0.302
Suburb	0.002	0.147	– 0.001	0.936
Rural	0.006	0.002	0.007	0.013

Notes: Oaxaca-Blinder Decomposition using Logit specification. Comparison group = Black and White households. Sample includes cases receiving housing assistance plus households with children not receiving assistance but income-eligible to receive housing assistance (income <= 50% area median income [AMI]).

Sources: 2015 and 2017 American Housing Survey Internal Use Files

Although both the explained and unexplained components are statistically significant, the explained coefficient is extremely small. Consequently, the lion's share of the difference between Hispanics' assisted housing receipt rate versus that of Blacks and Whites is attributable to the unexplained components (or coefficients on observables). Thus, for all assistance programs, 92 percent of the variance between Hispanics and other groups is not driven by differences in the measured characteristics of these groups.[46] Instead, the more important source of variation between these groups is the way the observables affect assistance receipt. For example, household income has a positive and statistically significant effect on receiving housing assistance for all three race and ethnic groups, but its effect is greatest for Hispanics. In the case of household size, the larger the size of the household, the less likely it is that Blacks, Whites, and Hispanic households will receive housing assistance. But again, as for income, the effect of household size is strongest for Hispanics.

Fair Share Analysis. We investigate whether Hispanic families receive their fair share of housing assistance from four different angles. These perspectives roughly move from a more objective and fundamental definition of equitable treatment to a more pragmatic definition that asks: Given the reality of how assistance is distributed across programs, are Hispanics achieving parity in each of the three program types relative to their Black and White counterparts?

[46] The percent of unexplained variance is the ratio of unexplained variance to the total of the explained plus unexplained variance.

The first analysis asks whether Hispanic households with children are receiving housing assistance at the same rate as their prevalence in the income-eligible population (≤ 50 percent of area median income [AMI]). Exhibit 8, panel A indicates that if Hispanic families were present in assisted housing as they are in the income-eligible population, we would expect that roughly one-third of households with children receiving housing assistance should be Hispanic. Instead, one-fifth of housing assistance households with children are Hispanic. This shortfall in assistance receipt is similar to that for White households with children. For Whites, we would expect that, based on their prevalence among income-eligible households, 40 percent would be assistance recipients, but 24 percent actually receive assistance. The estimates are dramatically different for Black households with children. Although 26 percent of Blacks are income-eligible for assistance, more than double that rate, 56 percent, receive housing assistance.

Exhibit 8

Fair Share Analysis

A. Assisted Housing by Program Type, by Race and Ethnicity of Households with Children				
	Income Eligible Households	Any Assistance	% Inc Elig Receiving Assistance	
% Hispanic	33.7	20.2	10.8	
% Black	26.4	56.1	38.3	
% White	39.9	23.7	10.7	
(N)	10,700	3,500	10,700	
B. Assisted Housing of Households with Children by Race and Ethnicity, by Program Type				
	Hispanic	**Black**	**White**	**Total**
% Public Housing	29.3	23.0	20.1	23.6
% Multifamily	18.7	22.6	22.4	21.8
% Voucher	52.0	54.4	57.5	54.6
(N)	650	2,000	800	3,500

Notes: Unweighted N, weighted percentages. Multifamily housing is limited to Project-Based Section 8.
Sources: 2015 and 2017 American Housing Survey Internal Use Files

The second analysis asks how the share of Hispanic income-eligible families receiving housing assistance compares to the fraction of income-eligible Black families and White families receiving assistance. This is also shown in panel A of exhibit 8. Column 3 indicates that of Hispanic families who are income-eligible for housing assistance, about 11 percent receive it. Among income-eligible Black families, 38 percent receive it, with the comparable figure for White families roughly 11 percent. Viewed from this perspective, the Hispanic rate of assistance receipt is essentially identical to that of Whites but less than one-third that of Blacks.

The third analysis asks whether Hispanics are over- or under-represented in each of the three housing assistance programs. That is, among assistance recipients, are Hispanics receiving roughly the same share of units in each of the three assistance programs as their Black and White counterparts? Exhibit 8, panel B provides the answer.[47] Data columns 1–3 show the participation of each of the race and ethnic groups in each program. Data column 4 shows participation in all assisted housing programs combined as a frame of reference. These estimates reveal that Hispanics are over-represented in the public housing program and somewhat underrepresented in both the multifamily and voucher programs. Specifically, nearly 24 percent of assistance recipients in the three race and ethnic groups combined live in public housing, but 29 percent of Hispanics live in public housing. On the other hand, about 22 percent of assistance recipients live in multifamily units compared to nearly 19 percent of Hispanics residing in multifamily units. Almost 55 percent of recipients use vouchers, compared to 52 percent of Hispanic families using housing vouchers. By comparison, both Blacks and Whites are somewhat under-represented in public housing.

The fourth fair share analysis examines state variation in housing assistance participation rates of income-eligible Hispanics. Unfortunately, no existing data allow us to focus solely on households with children, so this analysis sample includes all Hispanic, Black, and White households. We proxy the ≤ 50 percent of AMI income-eligibility threshold with 130 percent of the federal poverty line.[48]

The results are shown in appendix exhibit A-4. Using the "total" line, the first entry in the table, to illustrate how to interpret these estimates, Hispanic households receive 78 percent of what we would expect them to receive if they were obtaining their fair share of housing assistance relative to their income-eligibility rate. We arrive at this estimate by dividing 16.5 percent, the share of all income-eligible Hispanic households receiving housing assistance, by 21.1 percent, the percent of all income-eligible households receiving housing assistance. Even a cursory glance at the last column in appendix exhibit A-4 reveals the wide variation across states. This disparity ranges from a low of 17.1 percent in South Carolina to a high of 174.4 percent in New Hampshire. Overall, in 43 percent of states, Hispanic households receive less than half of their fair share of assistance, and in another 37 percent, they receive at least one-half but less than full parity. In the remaining 20 percent of states, Hispanic households are at parity or beyond it. Although some of the sizable rates in this last group of states undoubtedly arise because of the small number of cases, these outliers are the exception.[49]

Discussion

In this research, we use rich data to study the status of Hispanic households with children living in assisted housing at the end of the 2010 decade. We develop a national profile of Hispanic families in assisted housing and compare it, using T-tests of mean differences, to that of non-Hispanic Black and White households with children in assisted housing. We then use multivariate regression and decomposition analysis to estimate the effect of being Hispanic on the odds of receiving assistance and whether being Hispanic *per se* could plausibly explain Hispanic families' significantly lower chances of assistance receipt relative to their Black and White counterparts. In a final set of

[47] This was previously discussed under background characteristics.

[48] 130 percent of the poverty line is roughly equivalent to HUD's ≤50 percent of AMI (authors' analysis; see Technical Appendix).

[49] In New Hampshire, for example, we estimate roughly 2,566 Hispanic households with incomes at or below 130 percent of poverty and total households at or below 130 percent of poverty of $63,922.

analyses, we estimate whether Hispanic households receive their fair share of assistance nationally and state-by-state.

We find that regardless of assisted housing program, most Hispanic families, 68 percent, live in central cities. This rate climbs to 75 percent in the public housing program and falls to 64 percent in the voucher program. Although most Hispanic families in the voucher program live in central cities, it is worth observing that it is also the only assisted housing program in which as many as one-third of Hispanic households with children live in the suburbs. Vouchers also produce the largest share of Hispanics, 43 percent, living in less than 20 percent poverty tracts. This rate of residence in low-to-moderate poverty tracts is 35 percent greater than what Hispanics experience in the public housing program (32 percent in ≤ 20 percent poverty tracts). These estimates suggest that a sizable share of Hispanic families uses the voucher as a gateway to lower-poverty neighborhoods in the suburbs.

The most striking disparity between Hispanics and Blacks and Whites is the size and likely crowding in the assisted housing unit. Whether measured by the traditional more than one person per room or HUD's more than two person per bedroom, the fraction of crowded units is far higher among Hispanic families. Using the more sensitive bedroom measure, Hispanic households with children are nearly twice as likely as their Black counterparts and almost three times as likely as their White counterparts to qualify as crowded. These are large effects at 0.4 of a standard deviation.

The square footage measures also reveal sizable and statistically significant differences between Hispanics compared to Blacks and Whites. On average, across assistance programs, Hispanics' housing units are 73 square feet smaller than those of Whites (1,025 versus 1,098, respectively) and 93 square feet smaller than those of Blacks (1,025 versus 1,116, respectively). Since Hispanic households with children in assisted housing are larger, on average than those of Black and White families, Hispanics' housing units should be somewhat larger than those of Blacks and Whites, not smaller as indicated by the AHS estimates. The square footage per person comparisons account for household size and confirm the smaller space available in Hispanics' housing units. Hispanic families live in assisted housing units with roughly 305 square feet per person compared to 340 for Blacks and 347 for Whites. Comparing the three assisted housing programs, vouchers increase the chances of access to a larger than average unit, public housing offers an even chance, and multifamily housing decreases the chances of living in a larger than average unit.

These dissimilarities across groups do not arise because of differences in the measured characteristics of the groups included in the models. While the discrepancies could result from differences in characteristics that are unmeasured and therefore not included in the models, it is also possible that there is something about being Hispanic *per se* that drives the results.

The larger household size among Hispanics is not attributable to more children than Whites or Blacks, but instead to additional adults. As a result, Hispanic families in assisted housing have a significantly larger fraction of multigenerational households than their counterparts. It is also possible that they are more likely to share housing with other unrelated adults (Dougherty, 2021). Children, especially at younger ages, may not require as much space as adults.

What else could account for the differences in the space available in the housing unit? Square footage is not based on objective and validated measurement but on self-reports, which are subject to error. But there is no obvious reason to expect systematic differences in square footage reporting by the three race and ethnic groups. The only exception might be the effect of possible social desirability bias among Hispanic respondents. Hispanics assigned significantly higher housing unit and neighborhood ratings than Blacks and Whites, despite having a somewhat greater number of deficiencies in their housing units and neighborhoods. In multivariate models, being Hispanic increased the 10-point house rating by nearly 1 point and increased the neighborhood rating by 0.41 of a point. However, if this positive bias in Hispanics' responses affected their square footage reporting, it should result in Hispanic respondents reporting *larger* square footage in their housing units compared to Blacks and Whites, not the smaller square footage observed in the data.

Another possibility is that the three race and ethnic groups do not live in the same housing markets or submarkets. Each market offers a different supply of HUD-assisted housing units and affordable housing units in the private stock that could accommodate Hispanic families' larger household size. The fact that each of the three race and ethnic groups in our assisted housing sample lives in a census tract where the majority of residents share the assisted household's same race and ethnicity (e.g., Black assisted families live in tracts where 53 percent of residents are Black) provides suggestive evidence that most are living in different neighborhoods. And Hispanics tend to live in tracts with median house values and rents that either approach or exceed national medians. This also distinguishes their place of residence relative to Black and White assisted housing families.

A third option is that disparities arise because Hispanic households add members after the family moves into assisted housing. Although the public housing authority (PHA) or multifamily housing manager may attempt to relocate such households to a larger unit to accommodate the additional household members who join the family after their initial move into assisted housing, supply constraints on units for larger-than-average household sizes may make this difficult, if not impossible.

The pattern of Hispanic assisted housing families living in tracts with higher median house values and rents than their Black and White counterparts is noteworthy, not only because it demonstrates that the three groups live in different neighborhoods, as alluded to previously.. Also impressive is that this pattern holds regardless of program type. Median rents are higher in the voucher program and otherwise hover around the national median. This is consistent with the pattern of Hispanics living in high-rent cities noted at the outset of this report. Even so, Hispanic assisted housing families live in census tracts with an average poverty rate of 26 percent, increasing to 31 percent in the public housing program. Further, roughly 35 percent of Hispanics live in assisted housing units located in tracts with a poverty rate of 30 percent or higher. The rate of Hispanics in such high-poverty tracts is highest, at 50 percent, for those living in public housing, and is lowest, at 25 percent, for Hispanics using vouchers.

Being a Hispanic household with children reduces the chances of receiving housing assistance by about one-third relative to Black and White families. These chances improve to nearly 50 percent for public housing and decline to about 30 percent for vouchers. This disparity is not explained by the measured characteristics of the three race and ethnic groups. The two remaining explanations are either the possibility that differences in unmeasured characteristics play a role or that something about being a Hispanic family drives down the odds of assistance receipt.

In light of these findings, the results of the fair share analysis are not surprising. If Hispanic families were receiving housing assistance at the same rate as their prevalence in the income-eligible population of Hispanics, Blacks, and Whites, one-third of recipients should be Hispanic. Instead, 20 percent are Hispanic. This disparity is similar for Whites but entirely different for Blacks. Using this criterion, 26 percent of Blacks should participate, but 56 percent do so. The share of Hispanic income-eligible families receiving housing assistance, 20 percent, is nearly 20 percent lower than that for White families (24 percent) but is less than one-half the 56 percent rate for Blacks families. Across assisted housing programs, Hispanic families are over-represented in the public housing program and somewhat under-represented in the multifamily and voucher programs. Unfortunately, analysis at the state level cannot focus solely on households with children because of data limitations. For all Hispanic households, the likelihood of receiving their fair share of housing assistance varies widely across the United States. On average, Hispanic households receive 78 percent of their fair share based on income eligibility on average across all states and housing assistance programs. Southern states (e.g., South Carolina, Georgia, Arkansas, Alabama) tend to under-serve Hispanic households. In contrast, states in New England and Arizona and Colorado tend to over-represent them. California, New Mexico, and Texas are close to parity in allocating assisted housing units to Hispanic families.

The two findings with potentially the most direct implications for research and policy are the square footage per person deficit of Hispanic families and the fair share results. In both instances, we need additional information before it is possible to design evidence-based policy remedies. For square footage, the first step is to corroborate the results of self-reported square footage in the AHS with accurate square footage data. Assuming confirmation, the question is whether the problem of under-sized units among larger-than-average Hispanic families is the result of an inadequate supply of large units in the public housing, multifamily, and private-market affordable stock. For vouchers, it is also possible that owners of larger units have lower participation rates than owners of average-size units, at least in part because rents on larger housing units may exceed HUD's fair market rent threshold. Currently, the under-supply of large units in project-based housing cannot be solved within the confines of project-based programs since neither public housing nor multifamily programs are building new developments. However, adjusting the financial incentive structure for the Low-Income Housing Tax Credit program, essentially the one remaining mainstream project-based housing assistance program (under the aegis of the Department of Treasury), may be possible. Similarly, financial or other incentives could be offered to affordable housing developers to include large units in their developments.

On the fair share issue, the fundamental question is whether the source of the problem is primarily on the demand side, the supply side, or both. The literature review highlights prior research suggesting that Hispanics may either lack information about government programs, such as housing assistance, or may be reluctant to contact government agencies, as would be required to apply for housing assistance. Both the lack of information and trepidation about government might be addressed through culturally appropriate outreach. This would include significant participation by Hispanic community members, some of whom could act as navigators who explain housing programs, eligibility requirements, and the application process.

On the supply side, a key issue is that relative to Black and White families, Hispanic families are over-represented in public housing and somewhat under-represented in multifamily housing.[50] Perhaps this occurs because public housing units are heavily concentrated in geographic areas with large concentrations of income-eligible Hispanic families. The opposite situation occurs in the multifamily program (i.e., a demand-supply geographic mismatch). Additional analysis reveals considerable overlap between the geographic concentration of public housing units and that of income-eligible Hispanic families. Of the 29 percent of Hispanic families who live in public housing, roughly one-third are located in the Mid-Atlantic region.[51] This is by far the strongest association between potential Hispanic demand and public housing supply within the nine Census regions. Undoubtedly, it contributes to Hispanic families' over-representation in public housing. However, it is insufficient to fully explain it (see Technical Appendix).

This analysis is admittedly crude, and a deeper understanding of the geographic explanation would benefit from a more disaggregated and refined examination. But as a first approximation, the geographic distribution of the supply of assisted housing is unlikely to fully explain Hispanics' under- and over-representation in particular programs. As alluded to earlier, the modus operandi of the three program types may play a role. Applicants for public housing are typically selected in chronological order of their application date or random order if the PHA uses a randomized lottery to select applicants for the waiting list. Once deemed eligible for assistance under the PHA's HUD-approved plan, the applicant household moves into a public housing unit. By contrast, the multifamily manager and, in the voucher program, the private-market landlord or manager, have far greater discretion. Is this discretion the reason for under-representation? The last national housing discrimination study in 2012 indicates that Hispanics seeking a rental unit were told about 12.5 percent fewer units and shown 7.5 percent fewer units than their White counterparts (Turner et al., 2013). Additional research is needed to determine if the grim prospect of discrimination continues and if so, to propose effective remedies to law, policy, and practice.

[50] We exclude vouchers because landlords presumably play a major role, if not the major role, in determining whether a household will be accepted as a tenant.

[51] Defined by the Census Bureau as New York, New Jersey, and Pennsylvania.

Appendix

Exhibit A-1

Percent of Hispanic Households in 15 Highest-Rent Cities, 2020

City and State	Median Rent ($)	Hispanic Households (%)
San Francisco, CA	2,700	13.8
New York, NY	2,470	25.3
Boston, MA	2,150	16.7
San Jose, CA	2,090	24.1
Oakland, CA	2,000	17.6
Los Angeles, CA	2,000	36.2
Washington, DC	1,920	8.7
San Diego, CA	1,790	22.6
Miami, FL	1,710	70.4
Fort Lauderdale, FL	1,700	15.1
Santa Ana, CA	1,700	66.3
Anaheim, CA	1,660	42.3
Newark, NJ	1,600	33.4
Providence, RI	1,570	37.4
Long Beach, CA	1,550	31.8

Note: As a frame of reference, the national percent Hispanic households = 12.8% (2017 Integrated Public Use Microdata Series [IPUMS]).

Sources: Zumper National Rent Report, December 2020: www.zumper.com/glog/rental-price-data, Based on one-bedroom units; 2014–2018 American Community Survey, downloaded 12/17/20 from Social Explorer for percent Hispanic households

Exhibit A-2

Race and Ethnicity of Households with Children in Assisted Housing, by Census Tract Poverty Rate, and Assisted Housing Program (1 of 2)

	Hispanic	Black	White	Total
Any Assisted Housing (N)	650	2,000	800	3,500
Tract poverty < 10%	11.9	9.7	21.3	12.9
10% - < 20%	26.7	24.0	33.1	26.7
20% - < 30%	25.7	23.6	29.1	25.7
30% - < 40%	17.9	20.7	11.0	17.9
40%+	16.8	22.0	5.5	16.8
Public Housing N)	200	500	200	900
Tract poverty < 10%	13.7	5.2	19.8	10.3
10% - < 20%	18.4	16.1	17.8	17.0
20% - < 30%	17.9	13.0	33.9	18.5
30% - < 40%	17.0	25.1	14.0	20.9
40%+	33.0	40.6	14.5	33.4
Multifamily (N)	100	350	200	650
Tract poverty < 10%	8.8	3.2	8.7	5.5
10% - < 20%	28.7	26.3	49.4	32.4
20% - < 30%	29.4	21.6	27.4	24.4
30% - < 40%	22.5	23.1	10.9	20.0
40%+	10.6	25.8	3.6	17.7

Exhibit A-2

Race and Ethnicity of Households with Children in Assisted Housing, by Census Tract Poverty Rate, and Assisted Housing Program (2 of 2)

	Hispanic	Black	White	Total
Voucher (N)	350	1,200	400	1,900
Tract poverty < 10%	12.0	14.3	26.8	17.0
10% - < 20%	30.7	26.5	32.1	28.7
20% - < 30%	32.7	28.8	28.0	29.4
30% - < 40%	16.9	17.9	10.0	15.7
40%+	7.7	12.5	3.1	9.2

Note: Tract poverty = % of individuals in households with incomes below federal poverty line.

Sources: 2015 and 2017 American Housing Survey Internal Use Files

Exhibit A-3

Race and Ethnicity of Households with Children in Assisted Housing, by Census Tract Segregation Rate and Assisted Housing Program

	Hispanic	Black	White
Any Assisted Housing (N)	650	2,000	800
% Tract Black < 10%	52.5	11.7	72.5
10% - < 20%	17.5	14.4	15.2
20% - < 30%	6.7	12.6	4.1
30% - < 40%	9.1	9.9	2.7
40%+	14.2	51.3	5.4
Public Housing (N)	200	500	200
% Tract Black < 10%	49.2	7.2	64.3
10% - < 20%	16.5	10.3	16.7
20% - < 30%	6.8	9.7	4.9
30% - < 40%	11.1	11.2	2.2
40%+	15.7	61.5	11.9
Multifamily (N)	100	350	200
% Tract Black < 10%	55.9	8.3	69.5
10% - < 20%	13.9	14.7	16.7
20% - < 30%	5.3	16.9	5.2
30% - < 40%	14.8	8.5	1.3
40%+	10.1	51.7	7.3
Voucher (N)	350	1,200	400
% Tract Black < 10%	52.8	15.1	76.6
10% - < 20%	19.4	15.9	14.1
20% - < 30%	7.1	12.1	3.4
30% - < 40%	5.9	10.0	3.5
40%+	14.8	46.9	2.5

Note: Segregation measured by percent Black population in census tract.

Sources: 2015 and 2017 American Housing Survey Internal Use Files

Exhibit A-4

Fair Share Analysis of Hispanic Assisted Housing Receipt, by State (1 of 3)

Name	All Assisted Units				Households <= 130 poverty				AH Units / Households <=130% poverty				
	Total	Hisp	Black	White	Total	Hisp	Black	White	Total (%)	Hisp (%)	Black (%)	White (%)	Hisp / Total (%)
(Total N)	(4,901,738)	(766,811)	(2,123,614)	(1,736,283)	(23,236,957)	(4,649,243)	(4,642,978)	(11,685,022)	21.1	16.5	45.7	14.9	78.2
Alabama	91,503	915	66,797	22,876	459,008	20,884	187,576	237,120	19.9	4.4	35.6	9.6	22.0
Alaska	7,689	538	1,076	3,460	34,989	2,457	1,412	17,784	22.0	21.9	76.2	19.5	99.6
Arizona	40,909	14,727	9,000	14,318	520,503	183,970	29,353	251,593	7.9	8.0	30.7	5.7	101.9
Arkansas	51,580	1032	26,306	23,727	290,527	22,104	71,545	185,642	17.8	4.7	36.8	12.8	26.3
California	484,072	135,540	135,540	130,699	2,501,570	1,055,934	232,186	836,942	19.4	12.8	58.4	15.6	66.3
Colorado	61,078	18,323	11,605	28,096	330,534	91,737	18,811	199,439	18.5	20.0	61.7	14.1	108.1
Connecticut	82,338	32,112	24,701	23,878	189,355	53,048	31,413	93,862	43.5	60.5	78.6	25.4	139.2
Delaware	12,856	900	8,742	2,828	58,452	7,061	17,778	30,267	22.0	12.7	49.2	9.3	58.0
District Columbia	34,420	1,377	31,322	344	54,679	5,271	38,226	8058	62.9	26.1	81.9	4.3	41.5
Florida	193,218	54,101	102,406	32,847	1,574,390	441,178	329,372	744,001	12.3	12.3	31.1	4.4	99.9
Georgia	135,194	2,704	112,211	17,575	805,603	80,823	344,324	344,653	16.8	3.3	32.6	5.1	19.9
Hawaii	22,627	2,715	679	4,299	66,141	6,435	1105	18,771	34.2	42.2	61.4	22.9	123.3
Idaho	12,347	1,235	370	10,248	127,703	16,383	825	104,095	9.7	7.5	44.8	9.8	78.0
Illinois	224,517	13,471	141,446	60,620	877,652	145,892	236,896	441,570	25.6	9.2	59.7	13.7	36.1
Indiana	88,981	2,669	39,152	45,380	499,027	37,335	85,353	354,447	17.8	7.1	45.9	12.8	40.1
Iowa	40,661	1,220	8,132	30,089	215,099	13,621	15,015	174,887	18.9	9.0	54.2	17.2	47.4
Kansas	34,641	1,732	9,699	21,477	202,313	27,178	19,981	141,609	17.1	6.4	48.5	15.2	37.2
Kentucky	84,420	844	27,859	54,029	430,737	14,807	51212	351,829	19.6	5.7	54.4	15.4	29.1

Exhibit A-4

Fair Share Analysis of Hispanic Assisted Housing Receipt, by State (2 of 3)

Name	All Assisted Units				Households <= 130 poverty				AH Units / Households <=130% poverty				
	Total	Hisp	Black	White	Total	Hisp	Black	White	Total (%)	Hisp (%)	Black (%)	White (%)	Hisp / Total (%)
Louisiana	94,380	1,888	79,279	12,269	454,930	21,740	218,943	199,126	20.7	8.7	36.2	6.2	41.9
Maine	26,500	265	1855	23,055	108,759	1,979	2,182	99,815	24.4	13.4	85.0	23.1	55.0
Maryland	100,148	3,004	72,107	21,031	285,952	25,321	116,769	121,870	35.0	11.9	61.8	17.3	33.9
Massachusetts	194,522	58,357	38,904	83,644	412,510	88,769	41,422	242,569	47.2	65.7	93.9	34.5	139.4
Michigan	145,610	4,368	74,261	62,612	786,790	40,934	197,959	505,961	18.5	10.7	37.5	12.4	57.7
Minnesota	89,518	2,686	33,122	46,549	316,089	22,805	41,296	221,981	28.3	11.8	80.2	21.0	41.6
Mississippi	55,135	551	46,313	7,719	316,867	7,487	170,341	132,012	17.4	7.4	27.2	5.8	42.3
Missouri	91,467	1,829	46,648	41,160	482,123	20,897	89,099	349,266	19.0	8.8	52.4	11.8	46.1
Montana	13,679	547	274	11,080	88,048	3,172	539	73,634	15.5	17.2	50.8	15.0	111.0
Nebraska	27,803	1,668	7,785	16,960	130,026	17,173	12,482	92,232	21.4	9.7	62.4	18.4	45.4
Nevada	23,234	3,253	10,920	7,900	201,761	58,805	28,553	92,542	11.5	5.5	38.2	8.5	48.0
New Hampshire	21,327	1,493	640	18,554	63,922	2,566	1,564	56,685	33.4	58.2	40.9	32.7	174.4
New Jersey	165,307	44,633	71,082	42,980	472,871	141,382	104,386	190,183	35.0	31.6	68.1	22.6	90.3
New Mexico	25,660	15,139	1,283	6,928	205,250	107,845	4,152	65,346	12.5	14.0	30.9	10.6	112.3
New York	601,284	174,372	210,449	186,398	1,456,094	379,796	290,015	629,578	41.3	45.9	72.6	29.6	111.2
North Carolina	121,907	3,657	85,335	29,258	848,684	90,885	270,106	443,909	14.4	4.0	31.6	6.6	28.0
North Dakota	13,299	399	1463	9,841	53,382	2,310	1,904	41,608	24.9	17.3	76.8	23.7	69.3
Ohio	225,458	6,764	117,238	94,692	926,758	40,918	222,103	620,587	24.3	16.5	52.8	15.3	68.0
Oklahoma	53,344	2,667	20,271	25,605	325,670	33,027	39,273	199,141	16.4	8.1	51.6	12.9	49.3

Exhibit A-4

Fair Share Analysis of Hispanic Assisted Housing Receipt, by State (3 of 3)

	All Assisted Units				Households <= 130 poverty				AH Units / Households <=130% poverty				
Name	Total	Hisp	Black	White	Total	Hisp	Black	White	Total (%)	Hisp (%)	Black (%)	White (%)	Hisp / Total (%)
Oregon	52,188	4,697	5,219	38,097	310,926	41,984	10,007	229,046	16.8	11.2	52.2	16.6	66.7
Pennsylvania	220,213	22,021	85,883	103,500	903,011	98,404	169,671	45,325	24.4	22.4	50.6	228.4	91.8
Rhode Island	38,021	10,646	4,563	21,292	79,625	18,653	6,673	48,919	47.8	57.1	68.4	43.5	119.5
South Carolina	62,267	623	49,814	10,585	421,825	24,674	177,188	207,296	14.8	2.5	28.1	5.1	17.1
South Dakota	13,786	414	689	9,788	60,840	2,735	1,377	43,746	22.7	15.1	50.0	22.4	66.8
Tennessee	104,773	2,095	55,530	46,100	579,491	33,666	139,632	387,737	18.1	6.2	39.8	11.9	34.4
Texas	278,107	94,556	127,929	50,059	1,970,106	917,430	334,639	622,193	14.1	10.3	38.2	8.0	73.0
Utah	18,750	2,813	1,500	13,313	147,502	29,249	3,390	103,547	12.7	9.6	44.2	12.9	75.7
Vermont	12,665	127	507	11,399	44,473	729	641	41,094	28.5	17.4	79.1	27.7	61.2
Virginia	102,360	4,094	68,581	25,590	479,667	38,829	146,617	264,977	21.3	10.5	46.8	9.7	49.4
Washington	88,529	6,197	18,591	52,232	446,601	65,678	24,893	293,816	19.8	9.4	74.7	17.8	47.6
West Virginia	34,651	347	5,198	28,414	184,907	2,525	8,675	169,493	18.7	13.7	59.9	16.8	73.3
Wisconsin	77,022	3,851	23,107	46,213	396,006	36,225	53,691	283,422	19.4	10.6	43.0	16.3	54.7
Wyoming	5,773	635	231	4,676	37,209	4,533	413	29,797	15.5	14.0	55.9	15.7	90.3

Sources: Number of assisted housing units, total and by race/ethnicity: 2017 from HUD Picture of Subsidized Housing (huduser.gov. Number of households at or below 130 poverty derived from 2017 Integrated Public Use Microdata Series (IPUMS) (Ruggles et al. IPUMS USA: Version 10.0)

Acknowledgments

The authors gratefully acknowledge the support of the W.K. Kellogg Foundation. We also are grateful for helpful input from D. Acevedo-Garcia, A. Fenelon, N. McArdle, C. Kamasaki, E. Rushton, M. Snidal, and A. So.

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References

Blinder, A., 1973. "Wage Discrimination: Reduced Form and Structural Estimates," Journal of *Human Resources* 8 (4): 436–455.

Carrillo. L., M. Pattillo, E. Hardy, and D. Acevedo-Garcia. 2016. "Housing Decisions Among Low-Income Hispanic Households in Chicago," *Cityscape*. 18 (2): pp. 109–130.

Cortes, A., C. Herbert, E. Wilson, and E. Clay. 2006. *Improving Homeownership Opportunities for Hispanic Families*. Washington, D.C.: U.S. Department of Housing and Urban Development, Office of Policy Development and Research.

Creamer, J. 2020. *Inequalities Persist Despite Decline in Poverty For All Major Race and Hispanic Origin Groups*. https://www.census.gov/library/stories/2020/09/poverty-rates-for-blacks-and-hispanics-reached-historic-lows-in-2019.html.

Cueva-Dabkoski, M., and L. Morris. 2019. *The Trump Administration's Proposed "Mixed Status" Housing Rule is Another Form of Family Separation*. American Civil Liberties Union, July 10.

De La Roca, J., I. Ellen, and J. Stell. 2018. "Does Segregation Matter for Latinos?" *Journal of Housing Economics* 40: 129–144.

Devine, D., et al. 2003. *Housing Choice Voucher Location Patterns: Implications for Participant and Neighborhood Welfare*. Washington, D.C.: U.S. Department of Housing and Urban Development, Office of Policy Development and Research.

Dougherty, C. 2021. "As Jobs Dry Up, Tenants Pack in and Fall Behind," *The New York Times*, February 7.

Eggers, F. 2020. *Characteristics of HUD-Assisted Renters and Their Units in 2017*. Washington, D.C.: U.S. Department of Housing and Urban Development, Office of Policy Development and Research.

Endicott, Marisa (2015). Medill Reports. Evanston, IL: Medill School of Journalism, December 15.

Fontenot, K., J. Semega, and M. Kollar. 2018. *Income and Poverty in the United States: 2017*. Census Bureau Report P60-263. https://www.census.gov/library/publications/2018/demo/p60-263.html

Joint Center for Housing Studies (JCHS). 2020. *The State of the Nation's Housing 2020*. Cambridge, MA: JCHS of Harvard University. https://www.jchs.harvard.edu/sites/default/files/Harvard_JCHS_State_of_the_Nations_Housing_2020.pdf.

Kaiser Family Foundation. 2019. *Poverty Rate by Race/Ethnicity*. Obtained at: https://www.kff.org/other/state-indicator/poverty-rate-by-raceethnicity/?currentTimeframe=0&sortModel=%7B%22colId%22:%22Location%22,%22sort%22:%22asc%22%7D

Kasinitz, P., and J. Rosenberg. 1996. "Missing the Connection: Social Isolation and Employment on the Brooklyn Waterfront," *Social Problems* 43 (2): 180–196.

Latinos United v. Chicago Housing Authority, U.S. District Court, Northeastern District of Illinois. 1994.

Lens, M., and V. Reina. 2016. "Preserving Neighborhood Opportunity: Where Federal Housing Subsidies Expire," *Housing Policy Debate* 26 (4-5): 714–732.

McClure, K., A. Schwartz, and L. Taghavi. 2014. "Housing Choice Voucher Location Patterns A Decade Later," *Housing Policy Debate* 25 (2): 215–233.

National Center for Education Statistics. 2019. "Indicator 4: Children Living in Poverty." *Status and Trends in the Education of Racial and Ethnic Groups*. Obtained at: https://nces.ed.gov/programs/raceindicators/indicator_rad.asp

Noe-Bustemante, M. Lopez, and J. Krogstad. 2020. "U.S. Hispanic Population Surpasses 60 Million in 2019, but Growth has Slowed," Pew Research Center *Fact Tank*, obtained from: https://www.pewresearch.org/fact-tank/2020/07/07/u-s-hispanic-population-surpassed-60-million-in-2019-but-growth-has-slowed/

Oaxaca, R. 1973. "Male-Female Wage Differentials in Urban Labor Markets," *International Economic Review* 14 (3): 693–709.

Olivo, A. 2006. "Report Hits CHA on Latino Housing," *Chicago Tribune*, June 6.

Open Communities Alliance v. Carson, U.S. District Court, District of Connecticut. 2020.

Sard, B., D. Rice, A. Bell, and A. Mazzara. 2018. "Federal Policy Changes Can Help More Families with Housing Vouchers Live in Higher-Opportunity Areas." Washington, D.C.: Center on Budget and Policy Priorities.

Semega, J., M. Kollar, J. Creamer, and A. Mohanty. 2019. *Income and Poverty in the United States: 2018*. Census Bureau Report Number P60–266. https://www.census.gov/library/publications/2019/demo/p60-266.html.

Slopen, N. .2020. Email communication. September 9.

Turner, M. 2003. "Strengths and Weaknesses of the Housing Voucher Program." Testimony prepared for the Committee on Federal Services, Subcommittee on Housing and Community Opportunity. U.S. House of Representatives, June 17.

Turner, M., R. Santos, D. Levy, et al. 2013. *Housing Discrimination Against Racial and Ethnic Minorities 2012*. Washington, DC: U.S. Department of Housing and Urban Development, Office of Policy Development and Research.

Vargas v. Town of Smithtown, U.S. District Court, Eastern District of New York. 2007.

Watson, N., B. Steffen, M. Martin, and D. Vandenbroucke. 2020. *Worst Case Housing Needs: 2019 Report to Congress*. Washington, D.C.: U.S. Department of Housing and Urban Development, Office of Policy Development and Research.

Williamsburg Fair Housing Commission v. New York City Housing Authority, U.S. District Court, Southern District of New York. 1978.

Yzaguirre, R., L. Arce, and C. Kamasaki. 1999. "The Fair Housing Act: a Latino Perspective," *Cityscape*, vol. 4, no 3, pp. 161–189.

Hispanic Disaster Preparedness in the United States, 2017: Examining the Association with Residential Characteristics

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Abstract

The number of highly destructive disasters is increasing in regions of the United States where the Hispanic population is growing fastest. Up-to-date studies of disaster preparedness are needed that include housing measures and other factors that may account for differences in disaster preparedness between Hispanics and other racial and ethnic groups. This study fills this gap in the literature by using data from the 2017 American Housing Survey, which includes a topical module on disaster planning along with the core measures of housing and neighborhood characteristics, including housing tenure. The results reveal that Hispanics are generally less prepared than non-Hispanic Whites regarding resource- and action-based measures, with a few exceptions. Hispanics, Blacks, and Asians are significantly more likely than Whites to have at least 3 gallons of water per person, and Hispanics and Blacks are significantly more likely than Whites and Asians to have flood insurance. The findings show that housing and residential characteristics are consistently significant in predicting preparedness—controlling for other relevant variables—although they do not attenuate the disadvantages that Hispanics and Blacks face in their disaster preparedness relative to Whites. Future research would benefit from further exploration of the linkage between racial and ethnic inequalities in housing and neighborhood characteristics and household disaster preparedness.

Introduction

Highly destructive disasters are becoming more common in the United States, particularly in the south, central, and southeastern regions—the same regions in which the Hispanic population is growing fastest (Noe-Bustamante and Flores, 2019; Noe-Bustamante, Lopez, and Krogstad, 2019; Smith, 2020). Between 2010 and 2019, the United States experienced 119 disasters that each totaled at least one billion dollars in damages—an unprecedented number that nearly doubled the 59 disasters of the previous decade (Smith, 2020). In 2020 alone, the damage costs from billion-dollar disasters were close to $50 billion, exceeding the total for all such disasters in 2019 (JCHS, 2020). Geographically, the south, central, and southeast had the greatest number of those disasters and the largest financial impact from them, with Texas experiencing the most (Smith, 2020). Hispanics are particularly exposed to disasters simply because of their geographic concentration in those regions and states, although sociodemographic and housing factors may increase or diminish their vulnerability (Noe-Bustamante and Flores, 2019; Noe-Bustamante, Lopez, and Krogstad, 2019).

Hispanics' disaster preparedness is a topic that needs up-to-date research, especially given their potential exposure to disasters. Much of the literature on racial and ethnic differentials in disaster preparedness, however, relies on data that are about a decade old—from the 2006–2012 Behavioral Risk Factor Surveillance System (BRFSS), the 2008 General Social Survey, the 2010 Health and Retirement Survey, and the 2013 American Housing Survey (AHS; e.g., Al-Rousan, Rubenstein, and Wallace, 2014; Malmin, 2020; Nukpezah and Soujaa, 2018; Smith and Notaro, 2015). Given the significant increase in disasters since 2010, this body of research needs to be updated to examine the preparedness of Hispanics relative to other racial and ethnic groups and especially for the United States as a whole. New datasets from the 2017 U.S. Census Bureau's AHS (U.S. Census Bureau, 2018) and the Federal Emergency Management Agency's (FEMA's) 2017 and 2018 National Household Surveys (FEMA, 2020a) include questions on emergency preparedness for a representative sample of the U.S. population. Only a few publications report analyses of those new data sources (Rivera, 2020; Zamboni and Martin, 2020).

Few studies describe the emergency preparedness of Hispanics in the United States at a multistate or national level using multivariate analyses (Ablah, Konda, and Kelley, 2009; Bethel, Burke, and Britt, 2013; Cox and Kim, 2018; Killian et al., 2017; Malmin, 2020; Murphy et al. 2009; Rivera, 2020; Zamboni and Martin, 2020). Findings from such analyses are mixed as to whether Hispanics are equally or less prepared for disasters than non-Hispanic Whites (hereafter, Whites). Four studies find that Hispanics are similarly likely to be prepared as Whites (Ablah, Konda, and Kelley, 2009; Killian et al., 2017; Malmin, 2020; Murphy et al., 2009). By contrast, using the 2018 NHS, Rivera (2020) finds that Hispanics are less likely than non-Hispanics to have a household emergency plan in place, controlling for other relevant factors. In analyses of BRFSS data from eight states, Bethel, Burke, and Britt (2013) find that controlling for other factors, Hispanics are significantly less likely than other groups to have a 3-day supply of medication, and although Spanish-speaking Hispanics are less likely than Whites to have an emergency evacuation plan, English-speaking Hispanics are more likely than Whites to have such a plan. Zamboni and Martin (2020) and Cox and Kim (2018) find that Hispanics are significantly less likely than non-Hispanic Whites to be prepared for disasters, controlling for other socioeconomic and demographic characteristics.

Housing and its features constitute an additional dimension of disaster preparedness that is rarely measured (except for Murphy et al., 2009; Rivera, 2020). Indeed, very little research has explored the association between disaster preparedness and residential characteristics, such as housing tenure or housing and neighborhood characteristics; of those studies that do, renters are found less likely to be prepared than owners (Burby, Steinberg, and Basolo, 2003; Donahue, Eckel, and Wilson, 2014; Lee and Van Zandt, 2019; Rivera, 2020). Relative to Whites, Hispanics are less likely to be owners and more likely to live in poorer quality housing and neighborhoods, suggesting that housing tenure and housing and residential characteristics may confound the relationship between race, ethnicity, and disaster preparedness (Friedman, Gibbons, and Galvan, 2014; Friedman and Rosenbaum, 2004; McConnell, 2017; U.S. Census Bureau, 2020). Most of the studies that examine racial and ethnic differences in disaster preparedness do not control for differences in residential characteristics, and whether racial and ethnic disparities will persist after accounting for those differences in residential characteristics is unclear (e.g., Cox and Kim, 2018; Zamboni and Martin, 2020).

The main goal of the present study is to examine disaster preparedness among Hispanics relative to other racial and ethnic groups and explore whether any racial and ethnic differential in disaster preparedness remains after accounting for housing tenure, other residential characteristics, and socioeconomic and demographic control variables. A secondary goal is to explore the association between disaster preparedness and a set of residential characteristics, including housing tenure and housing and neighborhood characteristics. This study uses data from the 2017 American Housing Survey, which are ideal because they include a topical module on disaster planning and data on housing tenure and housing and neighborhood characteristics. The article concludes by discussing the implications of those analyses for the preparedness of Hispanics, relative to other racial and ethnic groups, for future climate-related disasters and how their preparedness relates to racial and ethnic stratification in residential attainment.

Background

Disaster Preparedness and Its Significance

In their literature review of studies published on disaster preparedness over a 15-year period, Levac, Toal-Sullivan, and O'Sullivan (2012) define household disaster preparedness as "knowing the risks particular to a community, developing an emergency plan, and having an emergency kit in the home containing food, water, and medical supplies to shelter in place for 72 hours;" it "involves practicing the plan with family members and learning about emergency shelters and community response evacuation plans." In disseminating information to the public about preparedness, FEMA (2014) focuses on four dimensions: (1) be informed, (2) make a plan, (3) build a kit, and (4) get involved. Accordingly, households must have resources in place to prepare themselves in the event of an emergency, but they also must know how to take the appropriate actions should a disastrous event occur (Zamboni and Martin, 2020). In this study, *household disaster preparedness* is defined as a combination of resource- and action-based measures, which are discussed more fully in the data and methods section.

The literature shows that disasters are not experienced equally by all segments of the population; people of color, women, and those with fewer economic resources fare worse in disasters than

Whites, men, and those who are more affluent (Fothergill, Maestas, and DeRouen, 1999; Fussell et al., 2018; Peacock, Morrow, and Gladwin, 1997; Reid, 2013). Having plans in place to evacuate promptly before the onset of a disaster, such as a hurricane, could possibly lessen those impacts. Research on Hurricane Katrina evacuees found significant racial and ethnic differences in those that evacuated before the onset of the storm and those that had emergency evacuation plans in place well before the storm (Spence, Lachlan, and Griffin, 2007). Whereas 85.5 percent of Whites evacuated before the onset of Katrina, 64.5 percent of Blacks and 82.9 percent of other non-Whites evacuated at the same time; well before the hurricane, 49.1 percent of Whites had emergency evacuation plans in place, relative to 31.4 percent of Blacks and 38.6 percent of other non-Whites (Spence Lachlan, and Griffin, 2007).

Studying racial and ethnic differences in preparedness may also be beneficial in terms of health outcomes. Lin and colleagues (2021) find that the combined impact of winter storms and power outages significantly increases hospitalization rates for cardiovascular disease in New York State. Particular groups of Hispanics, such as Puerto Ricans, and Blacks have higher mortality and morbidity from cardiovascular disease than Whites (Daviglus et al., 2012; Pearson-Stuttard et al., 2016). If those households were adequately prepared in terms of owning generators to use in the event of power outages, a widening of racial and ethnic disparities in these health outcomes could be prevented. Such preparedness could depend upon whether households live in owner- or renter-occupied housing, which is also stratified by race and ethnicity; therefore, considering housing characteristics is imperative in examining disaster preparedness.

Individual-Level Factors Related to Hispanic Disaster Preparedness

The literature on disaster preparedness mainly focuses on sociodemographic characteristics of individuals and households as correlates of preparedness. From our reading of the literature, the individual-level correlates of disaster preparedness may be grouped into two categories: those relating to risk of experiencing a disaster and those indicative of social status that influence the extent to which households have resources that allow them to prepare for a disaster.

With respect to the first set of factors, theoretical models—such as the Protective Action Decision model—suggest that the perception of disaster risk and actual disaster experience tend to make individuals more likely to prepare for future disasters (Basolo, Steinberg, and Grant, 2017; Bourque et al., 2012; Cameron and Shah, 2015; Lindell and Perry, 2012; Peacock, Brody, and Highfield, 2005). The empirical findings regarding the association between perceived risk of disaster and preparedness, however, are mixed, with some studies suggesting that self-efficacy to act on risk or fatalism, among other factors, may have a stronger impact than the perception of risk (Basolo, Steinberg, and Grant, 2017; DeYoung and Peters, 2016; Kievik and Gutteling, 2011; Witte and Allen, 2000). Stronger evidence indicates that previous experience with a disaster significantly raises the likelihood of preparedness (Basolo, Steinberg, and Grant, 2017; Bourque et al., 2012; Donahue, Eckel, and Wilson, 2014; Malmin, 2020; Pennings and Grossman, 2008; Rivera, 2020). Because Hispanics and Blacks are more likely than Whites to be at risk of experiencing disasters and be affected by them, Hispanics and Blacks may be more likely than Whites to prepare for disasters (Fothergill, Maestas, and DeRouen, 1999).

Social and human capital and capabilities are the second individual-level category of characteristics that are associated with preparedness and could also affect Hispanic preparedness relative to other racial and ethnic groups. However, the findings regarding those associations are mixed (Donahue, Eckel, and Wilson, 2014; Rivera, 2020). In general, older persons and those with higher levels of education and income are more likely to be prepared (Ablah, Konda, and Kelley, 2009; Cox and Kim, 2018; Malmin, 2020; Murphy et al., 2009; Zamboni and Martin, 2020), but sometimes those factors are found not to be associated with preparedness (Basolo, Steinberg, and Grant, 2017; Killian et al., 2017; Rivera, 2020). The results regarding marital status, the presence of children, nativity status, and disability status are also mixed in the literature, and whether studies include all or some of those variables depends on whether or not they were measured in the survey and, if so, whether the investigator chose to include them in the analysis (Ablah, Konda, and Kelley, 2009; Cox and Kim, 2018; Malmin, 2020; Murphy et al., 2009; Rivera, 2020; Zamboni and Martin, 2020). For example, Zamboni and Martin (2020) find that households with married couples are consistently more prepared for disasters, but those with children and disabled persons are less prepared, but the investigators do not include nativity status in the analysis. On the other hand, Rivera (2020) finds that the presence of children is not associated with preparedness, but marital status, nativity status, and disability status are not included in the model. Given that 59 percent of Hispanic adults have a high school degree or less education and that their poverty rate is above the national average (Noe-Bustamante and Flores, 2019), those factors could make Hispanics less prepared for disasters than Whites, but inconsistencies in model specifications muddy such conclusions.

Residential Characteristics, Place-Based Stratification, and Disaster Preparedness

Less research has focused on how residential characteristics affect household disaster preparedness (Burby, Steinberg, and Basolo, 2003; Lee and Van Zandt, 2019; Murphy et al., 2009; Rivera, 2020). In the case of Hispanics, housing tenure and residential conditions are important to consider. Hispanics have consistently been less likely to own their homes than are non-Hispanic Whites. According to data from the 2019 Housing and Vacancy Survey, the homeownership rate of Hispanics was 47.5 percent, whereas that of non-Hispanic Whites was 73.3 percent; Blacks had the lowest homeownership rates (42.1 percent), and Asians fell in between (57.7 percent) (U.S. Census Bureau, 2020). Those racial and ethnic patterns in homeownership rates have persisted for decades (Acolin, Lin, and Wachter, 2019; U.S. Census Bureau, 2020). In addition to having less access to homeownership, Hispanics have lived in poorer quality housing and neighborhoods than have Whites (Friedman and Rosenbaum, 2004; Friedman, Gibbons, and Galvan, 2014; McConnell, 2017). In 2019, more than two-thirds of low-income Hispanics and Blacks lived in high-poverty neighborhoods, relative to about one-third of low-income Whites and Asians (JCHS, 2020).

People's homes likely affect their preparedness in two ways, through their use and exchange values (Lee and Van Zandt, 2019; Logan and Molotch, 1987). Use values refer to the overall benefits of consumption that are gained from a home. Exchange values refer to the gains made from homes as units for sale within the housing market or through investment. Use values of housing can shape preparedness in several ways. The first relates to housing tenure. Households that own their homes generally have more income than renters, which increases their ability to prepare (Lee and Van Zandt, 2019). Because owners generally stay in their homes longer than renters, owners have more knowledge about the potential risk of the area for experiencing a disaster, which would make them more likely to be prepared (Burby, Steinberg, and Basolo, 2003; Lee and Van Zandt, 2019). Homeowners also benefit from maintaining and upgrading their homes, which often makes it more hazard resistant—a benefit realized in current use and future exchange value (Iwata and Yamaga, 2008). Because of their longer length of residence in communities, owners generally have more social ties with their neighbors than do renters, and those social networks could prepare them better for disasters than would be the case for renters (Burby, Steinberg, and Basolo, 2003; Lee and Van Zandt, 2019). Indeed, some researchers have suggested that a shared sense of values and willingness to act at the community level, also known as collective efficacy, make households more prepared for disasters (DeYoung and Peters, 2016; McIvor, Paton, and Johnston, 2009). Hispanics and Blacks are less likely than Whites and Asians to be owners, and for all of the aforementioned reasons, we expect that their levels of preparedness will be lower than those of Whites and Asians.

Other residential characteristics relate to the use-value that a household may acquire from their home, including the year the unit was built, the type of building in which the unit is located, and the quality of the housing unit and neighborhood. Older housing stock, which tends to have more structural problems, and housing units with maintenance deficiencies are more likely to be subject to disaster-related damage than newer and better quality housing stock (Lee and Van Zandt, 2019). Evidence also suggests that single-family, detached housing is less susceptible to damage from disasters than mobile homes and multiunit buildings (Peacock et al., 2014). Thus, households living in newer, better quality housing stock and single-family, detached homes are less likely to experience disaster-related housing damage and losses. Households living in poorer quality residential locations, including neighborhoods with high levels of serious crime, also experience lower levels of collective efficacy, increasing their vulnerability to disaster effects (Sampson, 2012). When neighbors have greater collective efficacy, they are more likely to share information, assistance, and resources and provide aid to those with greater needs (Hurlbert, Haines, and Beggs, 2000; Klinenberg, 2002). Households living in older units, in multiunit buildings, and in housing and neighborhoods of lower quality will likely be less prepared for disasters, and, if those characteristics are confounded with racial and ethnic differences in disaster preparedness, the magnitude of the association between race and ethnicity and preparedness will diminish (Friedman and Rosenbaum, 2004; Friedman, Gibbons, and Galvan, 2014; JCHS, 2020).

In addition to the use-values of housing potentially shaping disaster preparedness and, specifically, Hispanic disaster preparedness, the role of exchange values is critical to consider. The social vulnerability of individuals is connected to place-based inequalities, and the exchange values of housing link directly to the larger system of place-based stratification (Cutter, Boruff, and Shirley, 2003; Logan and Molotch, 1987). Exchange values of housing depend upon the location of the housing, and the investment decisions of governments and private investors are influential in privileging some locations over others (Logan and Molotch, 1987). Prominent among the forces contributing to place-based inequalities in exchange values are the institutional actors that have created and perpetuated racial and ethnic residential segregation in America's cities and metropolitan areas (Logan and Molotch, 1987; Massey and Denton, 1993; Rothstein, 2017). The U.S. government's historical participation in redlining and contemporary forms of racial and ethnic discrimination in mortgage lending are just some of the ways in which Hispanics and other non-White groups have been relegated to living in poorer quality housing and neighborhoods and are less likely to be homeowners than are Whites (Massey and Denton, 1993; Rothstein, 2017; Taylor, 2019).

More recently, Hispanic and Black communities suffered immeasurably from subprime lending and foreclosures that occurred during the Great Recession (Bocian, Li, and Ernst, 2010; Rugh, 2014). According to Bocian and colleagues (2010: 3), "between 2009 and 2012, $194 billion and $177 billion, respectively, will have been drained from African-American and Hispanic communities in indirect 'spillover' losses" from the foreclosure crisis. Hispanic owners seem to have been hit hardest by the second surge of risky lending, known as "alt-A lending," which grew more rapidly after 2004 than subprime lending (Calem, Nakamura, and Wachter, 2011; Rugh, 2014). That wave of risky lending primarily took place in the Sunbelt, including places such as Florida, which also suffer from costly disasters (Kuebler and Rugh, 2013). The burst of the housing bubble in the late 2000s disproportionately affected Hispanics, who had the highest foreclosure rate after 2009 (Rugh, 2014).

These place-based inequalities must be considered in the context of disaster preparedness. From an exchange value perspective, housing tenure is important to consider in household preparedness, particularly related to Hispanic and Black preparedness relative to that of Whites. Because of racial and ethnic residential segregation and the Great Recession, even if Hispanics and Blacks own their homes, they receive lower levels of exchange value from their homes than do Whites and Asians (Friedman, Tsao, and Chen, 2013; JCHS, 2020; Mayock and Malacrida, 2018). Significant racial and ethnic differences exist in household wealth. In 2016, the median wealth values of Hispanic and Black households were $21,400 and $16,300—eight and ten times lower, respectively, than that of White households ($162,800), and Hispanics and Blacks acquired more of their wealth from homeownership—65 percent and 56 percent, respectively—than Whites (38 percent; JCHS, 2018: 15). The glaring racial and ethnic inequalities in wealth are related to those place-based inequalities and no doubt contribute to Hispanic preparedness levels relative to those of other racial and ethnic groups (Maroto, 2016; Mayock and Malacrida, 2018). In addition, with communities of color having lower levels of investment related to a historical legacy of discrimination in housing, Hispanics and Blacks will be less likely to be prepared than Whites and potentially Asians because of fewer resources accessible to those households (Bocian, Li, and Ernst, 2010; JCHS, 2020; Rothstein, 2017). Finally, due to disinvestment in communities of color resulting from persistently high levels of racial and ethnic residential segregation, crime is often higher, and levels of collective efficacy are generally lower, thereby weakening the ability of Hispanics and Blacks to prepare for disasters relative to Whites and Asians (Hurlbert, Haines, and Beggs, 2000; Klinenberg, 2002; Sampson, 2012).

Data and Methods

The analyses for this study are based on data from the 2017 panel of the AHS, a survey based on a biannual, multistage probability sample of more than 80,000 housing units throughout the United States. The 2017 panel includes a topical module on disaster planning, which asks several questions on disaster preparedness, the main focus of our research. In addition, the AHS data contain many indicators of housing and residential characteristics, such as the housing tenure, the adequacy and age of the unit, the building type within which the unit is located, and whether serious crime occurs in the neighborhood. The analytical dataset is restricted to occupied housing units that received the disaster planning topical module and for which the householder completed the questionnaire. Those housing units have a weight value greater than zero for the topical module (HUD, 2019).

The dependent variables consist of a variety of aspects of disaster preparedness, similar to those used in other research (e.g., Bethel, Burke, and Britt, 2013; Malmin, 2020; Murphy et al., 2009; Zamboni and Martin, 2020). Like Zamboni and Martin's study (2020), this study focuses on resource- and action-based preparedness measures. Concerning the former, this study uses the householder's responses to five questions regarding whether the household has (1) enough nonperishable food for 3 days; (2) at least 3 gallons or 24 bottles of water per person; (3) emergency supplies readily available to take with them if they had to evacuate from their home; (4) financial resources to meet expenses of up to $2,000 if they had to evacuate from their town or city to a safe place at least 50 miles away; and (5) enough reliable vehicles to carry all of their household members and a small amount of supplies, such as clothes and food, if they had to evacuate from their town or city to a safe place at least 50 miles away. For households living in single housing units and multiunit buildings with only two to four units, the study also uses the householder's response to whether they have a generator to provide electricity in the event of a power outage. Households in owner-occupied housing are asked whether they have flood insurance and the reason they purchased it—they (1) have flood insurance because it was required for home purchase or refinance; (2) bought flood insurance for other reasons, including because a neighbor purchased it; or (3) do not have flood insurance. To gauge action-based preparedness, for all households, the householder answers two questions concerning (1) where they would look *first* in the event of a major disaster to find information about what to do; and (2) where they would most likely stay if they had to evacuate from their town or city to a safe place at least 50 miles away for at least 2 weeks.

The key independent variable is the resident's race and ethnicity, with the primary focus being on Hispanic householders.[1] The study compares Hispanics to non-Hispanic Whites (hereafter, Whites), non-Hispanic Blacks (hereafter, Blacks), and Asians. Other races and multiracial and ethnic householders are excluded from this analysis; those latter groups contain too few cases to make any meaningful analysis.

Housing characteristics are examined as they relate to household disaster preparedness. One of the key measures in this regard is housing tenure, gauged by whether the household owns their home. The year that the housing was built is included and is represented by two dummy variables—(1) built between 1970 and 1999; and (2) built in 2000 or later—with units built before 1970 serving as the reference group. The type of unit in which households reside is included as three dummy variables: (1) a single-family, attached unit; (2) a mobile home, trailer, recreational vehicle (RV), or other units; and (3) a building with at least two apartments; single-family, detached units serve as the reference group. The adequacy of the unit is gauged by a dummy variable

[1] This study uses the racial and ethnic terms—such as Hispanic—that are used on the survey to be consistent with the way respondents have identified themselves.

indicating whether the unit is moderately or severely inadequate versus adequate. HUD created this measure of housing adequacy for the AHS (U.S. Census Bureau, 2019). According to their classification, units that are severely inadequate have at least one of the following conditions: (1) lack of plumbing, in terms of water or a full bathroom; (2) significant heating problems; (3) no electricity; (4) considerable electrical wiring problems; or (5) five maintenance problems from among the six following: (a) outside water leaks; (b) inside water leaks; (c) holes in the floors; (d) holes or cracks in the walls or ceilings; (e) large areas of peeling paint or broken plaster; or (e) signs of rats. Moderately inadequate units have at least one of the following: (1) three or four of the six maintenance problems just discussed; or (2) one of the following housing problems: (a) toilet breakdowns; (b) use of "unvented gas, oil, or kerosene heaters" as the main heating equipment; and (c) a lack of adequate kitchen facilities, such as a sink, stove, or working refrigerator (for more details, see U.S. Census Bureau, 2019). Units are adequate if they do not fall into the severely or moderately inadequate categories. Also included is a measure that gauges how much the household pays for either homeowner's or renter's insurance; if they do not pay for that type of insurance, the value is zero. The householder's perception of serious crime in their neighborhood is also included. Specifically, householders respond to the following question: "Do you agree or disagree with the following statement? This neighborhood has a lot of serious crime." A dummy variable is included based upon the responses, with the reference category being in disagreement with this statement. Finally, a dummy variable is included based upon the householder's answer to the question about whether they agree with the statement, "This neighborhood is at high risk for floods or other disasters" (1 = agree; 0 = disagree).

The analysis also includes measures of householder and household socioeconomic and demographic characteristics. One important variable is the number of years that the household has resided in the housing unit, which is used to gauge their knowledge of potential disaster threats. Two measures of socioeconomic status are included: (1) a dummy variable indicating whether the household's income falls at or below the poverty line; and (2) three dummy variables measuring the householder's educational level—(a) high school degree; (b) some college; and (c) at least a college degree—with less than a high school education serving as the reference group. Demographic factors are represented by the householder's age and four dummy variables indicating (1) whether the householder is foreign born; (2) whether the household is headed by a married couple; (3) whether children younger than 18 years old are present; and (4) whether the household contains one person who has a disability. In addition, the following three regional dummy variables are included in this analysis to control for variation in Hispanics' residential location and variation in the location of significant disasters: (1) Midwest; (2) South; and (3) West, with Northeast serving as the reference group.

Many of the dependent variables and a few independent variables are missing data. In a naïve approach such as complete-case-only analysis, one would drop 6.3 percent of cases due to incomplete values. To avoid the adverse impact of such an approach (see, for example, Little and Rubin, 2019), multiple imputation (MI) inference methods are employed, consistent with the survey design. More specifically, a sequential regression multiple imputation algorithm was used, as implemented in SAS PROC MI (with the srmi option), where each survey item subject to missing data is modeled using an appropriate regression model with all the other items and survey design information included as covariates. This method imputes survey items sequentially or one item at a time using all the other items, whether fully observed or imputed at previous iterations as covariates and preserves associations. Those regression models are used as a basis to sample missing values (i.e., multiple imputations) from the underlying posterior predictive distribution for missing data.

As described extensively in the missing data literature (e.g., Little and Rubin, 2019), multiple imputations obtained under this procedure allows estimation of uncertainty due to missing data on the statistical inferences. This estimation also allows an assessment of whether the imputation procedure worked well by comparing the rates of missing information to the raw missingness rates (Harel and Zhou, 2007). The models are fitted using each of the imputed datasets, and the inferential quantities—such as regression coefficients—are combined, along with their standard errors. This practice, known as combining estimates or multiple imputation inference, allows uncertainty due to the imputation process to be directly gauged. Following a general practice, estimates from 20 multiply imputed datasets were combined. As discussed in Little and Rubin (2019), most applications reveal a minimal gain in the statistical efficiency beyond 20 imputations.

Bivariate and multivariate analyses of those data were conducted. Bivariate analyses are used to examine how Hispanics compare with Whites, Blacks, and Asians in terms of their disaster preparedness and their housing, residential, socioeconomic, and demographic characteristics. Logistic and multinomial logistic regression analyses are used to examine whether any Hispanic disadvantages in disaster preparedness, relative to those for Whites, in the bivariate analyses remain after controlling for housing, residential, socioeconomic, and demographic characteristics. Through those multivariate analyses, the disaster preparedness of Blacks and Asians, relative to Whites, was also examined after controlling for other relevant characteristics. Multiple imputation inference replicates those analyses on each of the imputed datasets, and the estimates (e.g., logistic regression coefficients and standard errors) are then combined using rules defined by Rubin (2004). The level of statistical significance is set to be 0.05.

Results

Descriptive Analyses

How do Hispanics compare with Whites, Blacks, and Asians in terms of their disaster preparedness? Exhibit 1 addresses that question, presenting means for the main dependent variables. Considering multiple indicators of resource-based preparedness, Hispanic households are generally less prepared for disasters than Whites, equally prepared as Asians, and often more prepared than Blacks. Just over 77 percent of Hispanics have enough nonperishable food to last for at least 3 days, relative to 85.39 percent of Whites, 80.61 percent of Blacks, and about 77 percent of Asians. Hispanics are significantly less likely than Whites and Asians to have evacuation funds of up to $2,000 and evacuation vehicles available but are more likely than Blacks to have those funds and vehicles. Hispanic owners, however, are significantly more likely than White and Asian owners to have flood insurance. With respect to having a generator, Hispanics are significantly less likely than Whites but more likely than Blacks and Asians to have that resource.

Exhibit 1

Racial and Ethnic Differences in Disaster Preparedness in the United States, 2017

Characteristic	Percentage of … Hispanics	NH Whites	NH Blacks	Asians	Chi-square	Significance
Household has—						
Enough nonperishable food for at least 3 days	77.24	85.39	80.61	76.65	129.63	***
At least 3 gallons of water per person	66.36	57.42	63.13	63.03	90.48	***
Prepared emergency evacuation supplies	53.76	53.79	58.07	53.10	15.10	**
Evacuation funds of up to $2,000	65.98	83.98	60.94	87.03	712.48	***
Home covered by flood insurance (owners)					78.52	***
Yes, required for home purchase/refinancing	7.40	3.82	7.20	6.71		
Yes, decided to buy after neighbor did	0.64	0.33	0.72	0.62		
Yes, decided to buy for other reasons	9.51	5.86	9.66	6.63		
No	82.45	89.98	82.42	86.04		
Evacuation vehicle(s) available	89.72	95.02	86.34	91.45	198.29	***
Generator[1]	12.93	22.61	11.16	7.68	318.90	***
First source of emergency info during disaster					231.17	***
Family, friends, or neighbors	24.51	17.05	17.02	19.02		
Radio	12.40	14.12	13.20	10.11		
Television	30.29	31.14	40.54	25.19		
Internet	29.38	32.80	24.55	42.60		
Other source	3.42	4.89	4.70	3.08		
Likely place to stay during a 2-week evacuation					500.12	***
With relatives or friends	69.14	65.30	66.57	61.40		
Public shelter	8.39	3.04	7.32	5.97		
Hotel or motel	19.19	24.46	24.01	30.79		
Travel trailer or recreational vehicle	1.11	3.42	.34	.22		
Other	2.16	3.78	1.77	1.62		
N	4,158	16,573	3,740	1,629		

NH = Non-Hispanic.

[1]This variable is asked only for households living in buildings with fewer than five units.

****p<.001. **p<.01. *p<.05.*

Source: Authors' tabulations of the 2017 American Housing Survey

By contrast, non-Whites are more prepared than Whites on two resource-based items. Hispanics, Blacks, and Asians are significantly more likely than Whites to have at least 3 gallons of water per person; likely because of concerns with the local water supply rather than an impending disaster, those groups tend to stock up on water. Blacks were more likely than all other groups to report having emergency supplies readily available to take with them if they have to evacuate from their home.

As far as more action-based items—where groups get their emergency information during a disaster and plan to stay if they are forced to evacuate from their homes for at least 2 weeks—notable differences emerged between Hispanics and the other racial and ethnic groups. For emergency information, Hispanics are significantly more likely than Whites, Blacks, and Asians to rely first on family, friends, or neighbors. Blacks are much more likely than other groups to rely on television for that information. Asians and Whites are more likely than Hispanics and Blacks to rely on the internet. Concerning evacuation destinations, Hispanics are significantly more likely than Whites, Blacks, and Asians to stay with relatives or friends, but they are also more likely than Whites and Asians to stay in a public shelter. Hispanics are the least likely to stay in a hotel or motel, Asians are the most likely, and Whites and Blacks fall in between. Whites are the most likely to plan to stay in a travel trailer or RV. These bivariate racial and ethnic differences in preparedness may be due to confounding with housing and resources.

Racial and ethnic differences in disaster preparedness are likely associated with disparities in residential characteristics and socioeconomic and demographic factors. Exhibit 2 reports the mean differences in those variables between Hispanics and other racial and ethnic groups. Notably, all of the racial and ethnic differences in the characteristics presented in exhibit 2 are statistically significant. The differences in housing tenure are similar in nature to those discussed previously. Just over 48 percent of Hispanics and 45 percent of Blacks own their homes, relative to nearly 73 percent of Whites and just over 60 percent of Asians. Hispanics and Blacks are more likely than Whites and Asians to live in housing stock built before 1970. Just over 26 percent of Asians live in housing built in 2000 or later, relative to 18.59 percent of Hispanics, 18.61 percent of Whites, and 19.48 percent of Blacks. Regarding the type of building in which the home is located, 70.18 percent of Whites live in a single, detached unit, compared with 52.51 percent of Hispanics, 50.48 percent of Blacks, and 55.85 percent of Asians. Non-Whites are more likely than Whites to live in a building with two or more apartments.

Exhibit 2

Racial and Ethnic Differences in Housing, Residential, Householder, and Household Characteristics in the United States, 2017 (1 of 2)

Characteristic	Percentage of... Hispanics	NH Whites	NH Blacks	Asians	Chi-square[a]	Significance
Housing and Residential Characteristics						
Owner	48.15	72.76	45.14	60.38	950.53	***
Year built						
Before 1970	41.58	39.47	42.97	32.16	40.04	***
1970–1999	39.84	41.92	37.55	41.43	16.91	**
2000 or later	18.59	18.61	19.48	26.41	29.42	***
Type of building in which unit is located						
Single-family home, detached	52.51	70.18	50.48	55.85	527.62	***
Single-family home, attached	8.58	6.31	9.94	9.53	52.83	***
Mobile home, trailer, RV, or other	5.86	6.00	3.83	.90	153.13	***
Building with 2+ apartments	33.05	17.52	35.75	33.72	551.71	***
Moderately or severely inadequate housing	6.59	4.21	7.16	2.13	70.98	***
Property insurance amount (mean)	43.62	73.32	44.32	72.61	196.15	***
Agrees that neighborhood has serious crime	9.69	4.26	12.02	4.06	192.68	***
Agrees that neighborhood is at high risk for floods or other disasters	9.53	6.98	9.94	6.29	34.71	***
Household and Householder Characteristics						
Number of years household in the unit (mean)	9.03	13.47	10.78	7.66	202.89	***
Income at or below the poverty line	19.69	10.35	23.67	13.00	297.71	***
Householder education					1152.15	***
Less than high school degree	29.91	6.65	12.19	6.95		
High school degree	26.15	24.19	29.56	14.96		
Some college	25.55	30.32	31.58	17.41		
Bachelor’s degree or more	18.39	38.84	26.67	60.68		
Foreign born	52.16	4.22	11.71	77.98	2,876.83	***
Householder age (mean)	46.40	54.08	50.17	46.15	243.84	***
Household is a married-couple family	51.28	51.59	29.23	62.26	472.05	***

Exhibit 2

Racial and Ethnic Differences in Housing, Residential, Householder, and Household Characteristics in the United States, 2017 (2 of 2)

Characteristic	Percentage of… Hispanics	NH Whites	NH Blacks	Asians	Chi-square[a]	Significance
Household and Householder Characteristics						
Household has children	48.19	25.76	32.04	40.76	461.15	***
Household has at least one person age 65+	21.03	32.76	22.55	18.16	356.47	***
At least one person in the home has a disability	18.95	24.09	23.22	10.71	165.38	***
Region					1,558.72	***
Northeast	15.61	19.03	15.18	19.98		
Midwest	9.03	26.69	17.84	13.03		
South	37.83	34.37	59.35	26.41		
West	37.53	19.91	7.62	40.57		

NH = Non-Hispanic. RV = recreational vehicle.

[a]The mean values in the exhibit use the F-statistic from regressing the characteristic on the dummy variables for race/ethnicity.

****p<.001. **p<.01. *p<.05.*

Source: Authors' tabulations of the 2017 American Housing Survey

Racial and ethnic differences exist in the quality of the residential environment and the amount paid in property insurance. More than 6 percent of Hispanics report living in moderately or severely inadequate housing, relative to 4.21 percent of Whites, 7.16 percent of Blacks, and only 2.13 percent of Asians. Whites and Asians pay more for property insurance than Hispanics and Blacks. Around 10 percent of Hispanics agree that serious crime is present in the neighborhoods in which they live. Although not as high as the percentage of Blacks agreeing with that statement (12.02 percent), it is more than double the rate of Whites and Asians. Nearly 10 percent of Hispanics and Blacks agree that their neighborhoods are at high risk of flood or other disasters, relative to 6.98 percent of Whites and 6.29 percent of Asians. Taken together, the residential inequalities faced by Hispanics and Blacks—relative to Whites—will likely be an important component to consider in examining their disaster preparedness.

Exhibit 2 also presents descriptive statistics for racial and ethnic differences in household and householder's socioeconomic and demographic characteristics; for brevity, a few of particular relevance are covered. On average, Hispanics have spent fewer years in their current homes than Whites and Blacks. Not surprising, the percentages of Hispanics and Blacks with income falling at or below the poverty line is at least 1.5 times that of Whites and Asians. Consistent with the variation in income levels, nearly 30 percent of Hispanics and 12.19 percent of Blacks have less than a high school degree, much higher than for White and Asians. Just over a majority, 52.16 percent of Hispanics are foreign born as compared with 4.22 percent of Whites, 11.71 percent of Blacks, and nearly 78 percent of Asians. Nearly 19 percent of Hispanics have at least one disabled person in their household, which is lower than the percentages for Whites and Blacks but higher than for Asians. Clearly, the socioeconomic disadvantages experienced by Hispanics relative to other groups will likely relate to their disaster preparedness relative to other groups.

Notable differences emerge in the regional location of Hispanics relative to other racial and ethnic groups. The shares of Hispanics living in the South and West are each about 38 percent. Although 34.37 percent of Whites live in the South, they are also relatively evenly distributed across the other regions. Blacks, on the other hand, are disproportionately concentrated in the South, with just over 59 percent living there. A significant share of Asians, 40.57 percent, live in the West, and the second largest share, 26.41 percent, can be found in the South. The fact that non-White groups disproportionately reside in the South and West will likely have implications for their disaster preparedness, given that those areas are highly vulnerable to adverse climate events.

Multivariate Analyses: Racial and Ethnic Differences in Disaster Preparedness

How do Hispanics and other racial ethnic groups fare relative to Whites in disaster preparedness outcomes, controlling for housing and residential characteristics and for household and householder socioeconomic and demographic characteristics? Exhibits 3a, 3b, 4, 5, and 6 tackle that question by examining multivariate analyses of all of the dependent variables presented in exhibit 1. The discussion proceeds as follows. First, the results of the coefficients for the racial and ethnic dummy variables are highlighted across all of the models in these exhibits. Then, the association results between our housing/residential variables and disaster preparedness outcomes are summarized. Finally, very brief attention is paid to the results for the rest of the control variables.

Exhibit 3a focuses on the first set of resource-based preparedness outcomes. Column 1 reports that Hispanics, Blacks, and Asians are significantly less likely than Whites to have enough nonperishable food for 3 days, controlling for other factors. By contrast, column 2 shows that Hispanics, Blacks, and Asians are significantly more likely to have available at least 3 gallons of water per person. The odds of Hispanics, Blacks, and Asians having water available are 1.45, 1.39, and 1.26, respectively, times the odds of Whites (exp[.373], exp[.330], exp[.234]). Column 3 reveals that only Blacks are significantly more likely to have emergency supplies readily available to take if they had to evacuate their homes, controlling for other relevant characteristics.

Exhibit 3a

Logistic Regression Coefficients of Disaster Preparedness in the United States, 2017 (1 of 2)

Characteristic	Enough non-perishable food (1)		Enough water per person (2)		Prepared Emerg Evac Supplies (3)	
Race and Ethnicity of Householder (ref. NH White)						
Hispanic	-0.191	**	0.373	***	0.071	
	(0.066)		(0.056)		(0.053)	
NH Black	-0.122	*	0.330	***	0.224	***
	(0.062)		(0.051)		(0.049)	
Asian	-0.233	**	0.234	**	0.046	
	(0.090)		(0.077)		(0.074)	
Housing and Residential Characteristics						
Owner (ref. Renter)	0.210	***	0.213	***	0.034	
	(0.063)		(0.048)		(0.047)	
Year built (ref. Before 1970)						
1970–1999	0.083		0.053		-0.027	
	(0.047)		(0.036)		(0.036)	
2000 or later	0.090		0.070		-0.023	
	(0.060)		(0.047)		(0.046)	
Type of building in which unit is located (ref. Single-family home, detached)						
Single-family home, attached	-0.108		-0.049		-0.075	
	(0.076)		(0.061)		(0.059)	
Mobile home, trailer, RV or other	-0.017		0.009		0.103	
	(0.099)		(0.077)		(0.074)	
Building with 2+ apartments	-0.214	***	-0.226	***	-0.160	***
	(0.061)		(0.049)		(0.048)	
Moderately or severely inadequate housing	-0.394	***	-0.327	***	-0.300	***
(ref. Adequate housing)	(0.084)		(0.073)		(0.072)	
Property insurance amount	0.000		0.000	*	0.001	***
	(0.000)		(0.000)		(0.000)	
Agrees neighborhood has serious crime	-0.174	*	-0.038		-0.100	
(ref. Disagrees)	(0.079)		(0.066)		(0.065)	
Neighborhood at risk for a disaster	-0.063		0.088		0.175	**
(ref. Disagrees)	(0.073)		(0.059)		(0.058)	

Exhibit 3a

Logistic Regression Coefficients of Disaster Preparedness in the United States, 2017 (2 of 2)

Characteristic	Enough non-perishable food (1)		Enough water per person (2)		Prepared Emerg Evac Supplies (3)	
Household and Householder Characteristics						
Number of years household in the unit	0.001		-0.000		-0.002	
	(0.002)		(0.002)		(0.002)	
Income at or below poverty line	0.033		0.098	*	0.039	
	(0.059)		(0.048)		(0.047)	
Householder education (ref. < High school degree)						
High school degree	0.149	*	-0.037		0.105	
	(0.072)		(0.060)		(0.057)	
Some college	0.144	*	-0.106		0.190	***
	(0.071)		(0.060)		(0.057)	
Bachelor's degree or more	0.023		-0.391	***	-0.025	
	(0.072)		(0.060)		(0.058)	
Foreign born (ref. Native born)	-0.374	***	0.243	***	-0.083	
	(0.062)		(0.053)		(0.051)	
Householder age	0.005	**	0.009	***	0.004	*
	(0.002)		(0.002)		(0.002)	
Household is married-couple family	0.216	***	0.003		0.087	*
(ref. other Family/non-family types)	(0.046)		(0.035)		(0.034)	
Household has children	0.055		-0.350	***	-0.098	**
(ref. Does not have children)	(0.050)		(0.039)		(0.038)	
Household has at least one person age 65+	0.066		-0.046		-0.020	
(ref. No one is 65+)	(0.064)		(0.050)		(0.049)	
At least one person in the home is disabled	-0.027		-0.151	***	-0.128	**
(ref. No one is disabled)	(0.052)		(0.040)		(0.039)	
Region (ref. Northeast)						
Midwest	-0.059		-0.177	***	-0.088	
	(0.070)		(0.051)		(0.050)	
South	-0.121		0.036		0.241	***
	(0.063)		(0.048)		(0.047)	
West	-0.187	**	0.095		0.202	***
	(0.066)		(0.051)		(0.050)	
Intercept	1.208	***	-0.023		-0.209	*
	(0.136)		(0.106)		(0.105)	

NH = Non-Hispanic.
****p<.001. **p<.01. *p<.05.*
Source: Authors' tabulations of the 2017 American Housing Survey

Exhibit 3b examines other resource-based disaster preparedness outcomes. According to column 1, Hispanics and Blacks are significantly less likely than Whites to have financial resources to meet expenses of up to $2,000 if they had to evacuate to a place at least 50 miles away, controlling for relevant factors. More specifically, the odds of Hispanics and Blacks having such financial resources are .70 and .53, respectively, times the odds of Whites. Column 2 shows that Hispanics, Blacks, and Asians are significantly less likely to have enough reliable vehicles to carry all household members and a small number of supplies if they had to evacuate to a place at least 50 miles away, controlling for other factors. Column 3 reports results for those living in housing units that are single units or multi-unit buildings with two to four units. Controlling for housing, residential, socioeconomic, and demographic characteristics, Hispanics, Blacks, and Asians are significantly less likely than Whites to have a generator that could provide electricity in the event of a power outage. In terms of the magnitude of those differences, the odds of Hispanics, Blacks, and Asians are .73, .56, and .41, respectively, times the odds of Whites (exp[-.319], exp[-.572], exp[.-.884]).

Exhibit 3b

Logistic Regression Coefficients of Disaster Preparedness in the United States, 2017 (1 of 2)

Characteristic	Has Evacuation Funds (up to $2000) (1)		Evacuation Vehicle Available (2)		Has a Generator (3)	
Race and Ethnicity of Householder (ref. NH White)						
Hispanic	-0.351	***	-0.300	**	-0.319	***
	(0.067)		(0.104)		(0.086)	
NH Black	-0.636	***	-0.565	***	-0.572	***
	(0.059)		(0.083)		(0.087)	
Asian	0.006		-0.478	***	-0.884	***
	(0.112)		(0.141)		(0.164)	
Housing and Residential Characteristics						
Owner (ref. Renter)	0.727	***	0.605	***	0.263	***
	(0.067)		(0.109)		(0.077)	
Year built (ref. Before 1970)						
1970–1999	0.273	***	0.325	***	0.234	***
	(0.049)		(0.074)		(0.052)	
2000 or later	0.557	***	0.340	***	0.086	
	(0.065)		(0.096)		(0.071)	
Type of building in which unit is located (ref. Single-family home, detached)						
Single-family home, attached	-0.011		-0.431	***	-0.843	***
	(0.079)		(0.113)		(0.108)	
Mobile home, trailer, RV or other	-0.650	***	-0.474	**	0.024	
	(0.091)		(0.164)		(0.095)	
Building with 2+ apartments	-0.095		-1.055	***	-0.784	***
	(0.061)		(0.092)		(0.138)	
Moderately or severely inadequate housing	-0.546	***	-0.410	***	-0.147	
(ref. Adequate housing)	(0.088)		(0.108)		(0.124)	
Property insurance amount	0.004	***	0.003	**	0.002	***
	(0.001)		(0.001)		(0.000)	

Exhibit 3b

Logistic Regression Coefficients of Disaster Preparedness in the United States, 2017 (2 of 2)

Characteristic	Has Evacuation Funds (up to $2000) (1)		Evacuation Vehicle Available (2)		Has a Generator (3)	
Housing and Residential Characteristics						
Agrees neighborhood has serious crime (ref. Disagrees)	-0.430 (0.078)	***	-0.451 (0.098)	***	0.099 (0.108)	
Agrees neighborhood at risk for a disaster (ref. Disagrees)	-0.037 (0.077)		0.058 (0.119)		0.206 (0.083)	*
Household and Householder Characteristics						
Number of years household in the unit	0.005 (0.002)	*	0.001 (0.003)		0.008 (0.002)	***
Income at or below poverty line	-0.810 (0.053)	***	-0.821 (0.067)	***	-0.177 (0.084)	*
Householder education (ref. < High school degree)						
High school degree	0.544 (0.066)	***	0.245 (0.094)	**	0.029 (0.088)	
Some college	0.767 (0.068)	***	0.513 (0.101)	***	0.070 (0.088)	
Bachelor's degree or more	1.600 (0.076)	***	0.444 (0.104)	***	-0.394 (0.091)	***
Foreign born (ref. Native born)	0.065 (0.067)		-0.235 (0.095)	*	-0.313 (0.091)	***
Householder age	0.004 (0.002)		-0.006 (0.003)		0.011 (0.003)	***
Household is married-couple family (ref. Other family/nonfamily types)	0.403 (0.049)	***	0.660 (0.077)	***	0.643 (0.051)	***
Household has children (ref. Does not have children)	-0.298 (0.052)	***	0.353 (0.082)	***	-0.104 (0.058)	
Household has at least one person age 65+ (ref. No one is age 65+)	0.316 (0.070)	***	-0.150 (0.098)		-0.334 (0.071)	***
At least one person in the home has a disability (ref. No one has a disability)	-0.679 (0.051)	***	-0.649 (0.070)	***	0.005 (0.057)	
Region (ref. Northeast)						
Midwest	-0.068 (0.073)		0.580 (0.095)	***	-0.270 (0.072)	***
South	-0.321 (0.068)	***	0.812 (0.086)	***	-0.212 (0.068)	**
West	-0.018 (0.073)		0.749 (0.093)	***	-0.500 (0.077)	***
Intercept	0.047 (0.136)		2.263 (0.194)	***	-2.251 (0.172)	***

NH = Non-Hispanic.
****p<.001. **p<.01. *p<.05.*
Source: Authors' tabulations of the 2017 American Housing Survey

Exhibit 4 focuses on multinomial regression coefficients from a model of whether the household purchased flood insurance and the reasons for the purchase—the last resource-based measure of disaster preparedness. In contrast to the previous set of results, the findings in exhibit 4 reveal that Hispanics and Blacks are significantly more likely than Whites to have flood insurance. Column 1 shows that the odds that Hispanics and Blacks have obtained flood insurance because it is required for the purchase of their home or to refinance their mortgage are 1.86 and 1.73 times, respectively, the odds of Whites (exp[.620], exp[.546]) relative to not obtaining flood insurance, and those differences are statistically significant. Column 2 shows that the odds that Hispanics and Blacks have obtained flood insurance for other reasons, including the fact that their neighbors bought it, are 1.71 and 1.59 times, respectively, the odds of Whites (exp[.537], exp[.466]) relative to not obtaining flood insurance, and those differences are statistically significant. Controlling for relevant factors, Asians do not significantly differ from Whites in their purchase or reasons for purchasing flood insurance.

Exhibit 4

Multinomial Logistic Regression Coefficients of Flood Insurance Purchase and Reasons in the United States, 2017 (1 of 2)

Characteristic	Flood Insurance Required for Purchase/Refinance vs. No Flood Insurance (1)		Flood Insurance Bought for Other Reason vs. No Flood Insurance (2)	
Race and Ethnicity of Householder (ref. NH White)				
Hispanic	0.620	***	0.537	***
	(0.160)		(0.134)	
NH Black	0.546	***	0.466	***
	(0.153)		(0.117)	
Asian	0.387		0.084	
	(0.226)		(0.190)	
Housing and Residential Characteristics				
Year built (ref. Before 1970)				
1970–1999	-0.163		-0.061	
	(0.110)		(0.090)	
2000 or later	-0.230		0.050	
	(0.136)		(0.112)	
Type of building in which unit is located (ref. Single-family home, detached)				
Single-family home, attached	0.177		0.248	
	(0.177)		(0.149)	
Mobile home, trailer, RV, or other	-0.777	**	-0.421	*
	(0.254)		(0.190)	
Building with 2+ apartments	-0.289		-0.361	
	(0.231)		(0.212)	
Moderately or severely inadequate housing (ref. Adequate housing)	-0.039		-0.351	
	(0.247)		(0.235)	
Property insurance amount	0.004	***	0.003	***
	(0.000)		(0.000)	
Agrees neighborhood has serious crime (ref. Disagrees)	-0.207		0.184	
	(0.238)		(0.173)	

Exhibit 4

Multinomial Logistic Regression Coefficients of Flood Insurance Purchase and Reasons in the United States, 2017 (2 of 2)

Characteristic	Flood Insurance Required for Purchase/Refinance vs. No Flood Insurance (1)		Flood Insurance Bought for Other Reason vs. No Flood Insurance (2)	
Housing and Residential Characteristics				
Agrees neighborhood at risk for a disaster (ref. Disagrees)	2.109 (0.116)	***	1.218 (0.112)	***
Household and Householder Characteristics				
Number of years household in the unit	-0.017 (0.005)	***	-0.007 (0.004)	
Income at or below poverty line	0.118 (0.190)		-0.163 (0.154)	
Householder education (ref. < High school degree)				
High school degree	0.102 (0.204)		-0.156 (0.157)	
Some college	0.140 (0.200)		-0.052 (0.155)	
Bachelor's degree or more	-0.122 (0.201)		-0.082 (0.154)	
Foreign born (ref. Native born)	0.068 (0.154)		0.164 (0.131)	
Householder age	-0.010 (0.005)	*	0.001 (0.004)	
Household is married-couple family (ref. Other family/nonfamily types)	0.165 (0.108)		0.111 (0.084)	
Household has children (ref. Does not have children)	-0.204 (0.117)		-0.035 (0.095)	
Household has at least one person age 65+ (ref. No one is age 65+)	0.057 (0.141)		0.175 (0.115)	
At least one person in the home has a disability (ref. No one has a disability)	-0.282 (0.132)	*	0.031 (0.097)	
Region (ref. Northeast)				
Midwest	-0.108 (0.194)		0.559 (0.145)	***
South	0.705 (0.165)	***	0.849 (0.132)	***
West	0.039 (0.186)		0.106 (0.156)	
Intercept	-3.216 (0.357)	***	-3.546 (0.305)	***

NH = Non-Hispanic. RV = recreational vehicle.

****p<.001. **p<.01. *p<.05.*

Note: Flood insurance variable only for owners.

Source: Authors' tabulations of the 2017 American Housing Survey

Exhibit 5 focuses on multinomial regression coefficients from a model for the first source of information households would use in the event of a disaster, an action-based form of preparedness. Controlling for relevant characteristics, columns 1 and 2 of exhibit 5 reveal that Blacks would be significantly more likely than Whites to use the radio or television as the first source of information, relative to relying on family and friends. Column 3 shows that Hispanics and Blacks would be significantly less likely than Whites to use the internet as the first source of information in the event of a disaster, relative to relying on family and friends. Column 4 finds that Hispanics would be significantly less likely than Whites to use a source other than family and friends as the first source of information. Controlling for relevant factors, Asians do not significantly differ from Whites in the types of sources that they would rely first on in the event of a disaster.

Exhibit 5

Multinomial Logistic Regression Coefficients of Disaster Information Source in the United States, 2017 (1 of 2)

Characteristic	Radio vs. Family and Friends (1)		TV vs. Family and Friends (2)		Internet vs. Family and Friends (3)		Other Source vs. Family and Friends (4)	
Race and Ethnicity of Householder (ref. NH White)								
Hispanic	-0.093		0.018		-0.280	***	-0.425	**
	(0.095)		(0.076)		(0.078)		(0.146)	
NH Black	0.222	*	0.400	***	-0.181	*	0.128	
	(0.089)		(0.070)		(0.076)		(0.124)	
Asian	-0.198		-0.039		-0.031		-0.364	
	(0.143)		(0.114)		(0.106)		(0.218)	
Housing and Residential Characteristics								
Owner (ref. Renter)	0.296	***	0.310	***	0.273	***	0.252	*
	(0.086)		(0.069)		(0.070)		(0.124)	
Year built (ref. Before 1970)								
1970–1999	-0.005		0.124	*	0.102		0.066	
	(0.063)		(0.052)		(0.054)		(0.090)	
2000 or later	-0.154		0.073		0.008		-0.033	
	(0.085)		(0.069)		(0.069)		(0.120)	
Type of building in which unit is located (ref. Single-family home, detached)								
Single-family home, attached	0.009		-0.026		0.150		0.052	
	(0.107)		(0.087)		(0.086)		(0.153)	
Mobile home, trailer, RV, or other	-0.425	**	-0.336	***	-0.365	***	-0.036	
	(0.133)		(0.099)		(0.110)		(0.171)	
Building with 2+ apartments	-0.063		0.108		0.072		0.426	***
	(0.089)		(0.070)		(0.071)		(0.118)	
Moderately or severely inadequate housing (ref. Adequate housing)	-0.003		-0.122		-0.034		0.073	
	(0.127)		(0.102)		(0.104)		(0.170)	
Property insurance amount	-0.000		0.000		0.001	*	-0.000	
	(0.000)		(0.000)		(0.000)		(0.001)	
Agrees neighborhood has serious crime (ref. Disagrees)	0.031		0.020		-0.141		0.055	
	(0.112)		(0.092)		(0.096)		(0.158)	

Exhibit 5

Multinomial Logistic Regression Coefficients of Disaster Information Source in the United States, 2017 (2 of 2)

Characteristic	Radio vs. Family and Friends (1)	TV vs. Family and Friends (2)	Internet vs. Family and Friends (3)	Other Source vs. Family and Friends (4)
Housing and Residential Characteristics				
Agrees neighborhood at risk for a disaster (ref. Disagrees)	0.280 **	0.056	0.027	0.351 *
	(0.100)	(0.086)	(0.088)	(0.138)
Household and Householder Characteristics				
Number of years household in the unit	0.002	-0.001	-0.012 ***	-0.006
	(0.003)	(0.002)	(0.003)	(0.004)
Income at or below poverty line	-0.302 ***	-0.184 **	-0.429 ***	-0.032
	(0.085)	(0.062)	(0.070)	(0.107)
Householder education (ref. < High school degree)				
High school degree	0.156	0.095	0.284 **	-0.045
	(0.099)	(0.074)	(0.087)	(0.140)
Some college	0.379 ***	0.213 **	0.579 ***	0.310 *
	(0.099)	(0.076)	(0.087)	(0.137)
Bachelor’s degree or more	0.520 ***	0.270 ***	1.086 ***	0.370 *
	(0.102)	(0.080)	(0.089)	(0.146)
Foreign born (ref. Native born)	-0.358 ***	-0.154 *	-0.229 **	-0.318 *
	(0.095)	(0.072)	(0.074)	(0.140)
Householder age	0.013 ***	0.022 ***	-0.019 ***	0.015 ***
	(0.003)	(0.002)	(0.002)	(0.004)
Household is married-couple family	0.430 ***	0.313 ***	0.324 ***	0.358 ***
(ref. Other family/nonfamily types)	(0.061)	(0.050)	(0.052)	(0.086)
Household has children	-0.020	0.044	-0.008	0.023
(ref. Does not have children)	(0.071)	(0.057)	(0.057)	(0.105)
Household has at least one person age 65+	-0.305 ***	-0.243 ***	-0.410 ***	-0.194
(ref. No one is 65+)	(0.084)	(0.068)	(0.072)	(0.119)
At least one person in the home has a disability	0.048	-0.122 *	-0.050	0.243 **
(ref. No one has a disability)	(0.068)	(0.055)	(0.060)	(0.094)
Region (ref. Northeast)				
Midwest	0.390 ***	0.219 **	0.104	0.153
	(0.093)	(0.073)	(0.076)	(0.126)
South	0.371 ***	0.438 ***	0.171 *	0.133
	(0.088)	(0.068)	(0.072)	(0.118)
West	0.508 ***	-0.248 ***	0.195 **	0.108
	(0.090)	(0.074)	(0.075)	(0.127)
Intercept	-1.839 ***	-1.315 ***	0.691 ***	-2.741 ***
	(0.195)	(0.155)	(0.157)	(0.286)

NH = Non-Hispanic. RV = recreational vehicle.
****p<.001; **p<.01; *p<.05.*
Source: Authors’ tabulations of the 2017 American Housing Survey

Exhibit 6 presents the multinomial regression coefficients from a model of where households report that they would most likely stay if they had to evacuate to a place at least 50 miles away for 2 weeks, the other action-based preparedness measure. Column 1 reveals that Hispanics, Blacks, and Asians would be significantly more likely than Whites to report that they would evacuate to a shelter relative to staying with relatives or friends, controlling for other relevant factors. Column 2 shows that Hispanics are significantly less likely than Whites to report they would evacuate to a hotel compared to staying with relatives or friends. Blacks are significantly more likely than Whites to report that they would stay in a hotel relative to staying with relatives or friends. Column 3 reports that Hispanics, Blacks, and Asians are significantly less likely than Whites to report that they would evacuate and stay in an RV compared with staying with relatives and friends. Column 4 shows that Blacks and Asians are significantly less likely than Whites to report that they would evacuate to another place compared with staying with relatives and friends, controlling for relevant factors.

Exhibit 6

Multinomial Logistic Regression Coefficients of Potential Evacuation Location in the United States, 2017 (1 of 2)

Characteristic	Shelter vs. Relatives or Friends (1)		Hotel vs. Relatives or Friends (2)		RV vs. Relatives or Friends (3)		Other Place vs. Relatives or Friends (4)	
Race and Ethnicity of Householder (ref. NH White)								
Hispanic	0.304	*	-0.201	**	-0.753	***	-0.335	*
	(0.120)		(0.067)		(0.226)		(0.164)	
NH Black	0.458	***	0.132	*	-1.695	***	-0.567	***
	(0.105)		(0.058)		(0.386)		(0.165)	
Asian	0.439	**	0.132		-1.596	***	-0.563	*
	(0.162)		(0.087)		(0.456)		(0.265)	
Housing and Residential Characteristics								
Owner (ref. Renter)	-0.252	*	0.190	***	0.505	**	-0.032	
	(0.116)		(0.057)		(0.186)		(0.141)	
Year built (ref. Before 1970)								
1970–1999	-0.347	***	0.089	*	0.166		-0.194	*
	(0.084)		(0.043)		(0.122)		(0.098)	
2000 or later	-0.583	***	0.152	**	0.303		-0.325	*
	(0.125)		(0.055)		(0.155)		(0.135)	
Type of building in which unit is located (ref. Single-family home, detached)								
Single-family home, attached	0.028		-0.069		-0.672	*	0.001	
	(0.138)		(0.070)		(0.276)		(0.175)	
Mobile home, trailer, RV, or other	0.379	*	-0.256	**	0.078		0.119	
	(0.157)		(0.095)		(0.210)		(0.195)	
Building with 2+ apartments	0.162		-0.052		-1.117	***	0.016	
	(0.104)		(0.059)		(0.273)		(0.146)	
Moderately or severely inadequate housing	0.454	***	-0.073		-0.290		0.520	**
(ref. Adequate housing)	(0.128)		(0.094)		(0.324)		(0.171)	
Property insurance amount	-0.003	**	0.001	*	-0.000		0.001	
	(0.001)		(0.000)		(0.001)		(0.001)	

Exhibit 6

Multinomial Logistic Regression Coefficients of Potential Evacuation Location in the United States, 2017 (2 of 2)

Characteristic	Shelter vs. Relatives or Friends (1)		Hotel vs. Relatives or Friends (2)		RV vs. Relatives or Friends (3)		Other Place vs. Relatives or Friends (4)	
Housing and Residential Characteristics								
Agrees neighborhood has serious crime	0.591	***	0.097		0.158		0.305	
(ref. Disagrees)	(0.112)		(0.084)		(0.254)		(0.164)	
Neighborhood at risk for a disaster	0.138		-0.015		0.350		0.124	
(ref. Disagrees)	(0.125)		(0.072)		(0.190)		(0.150)	
Household and Householder Characteristics								
Number of years household in the unit	-0.002		-0.000		-0.002		0.001	
	(0.004)		(0.002)		(0.005)		(0.004)	
Income at or below poverty line	0.487	***	-0.336	***	-0.191		0.064	
	(0.085)		(0.064)		(0.207)		(0.133)	
Householder education (ref. < High school degree)								
High school degree	-0.070		0.212	**	0.292		-0.086	
	(0.109)		(0.075)		(0.215)		(0.168)	
Some college	-0.055		0.243	**	0.280		0.167	
	(0.114)		(0.075)		(0.218)		(0.166)	
Bachelor’s degree or more	-0.522	***	0.407	***	-0.482	*	0.290	
	(0.132)		(0.074)		(0.23)		(0.172)	
Foreign born (ref. Native born)	0.801	***	0.277	***	-0.937	***	-0.250	
	(0.106)		(0.062)		(0.265)		(0.174)	
Householder age	0.023	***	0.015	***	0.023	***	0.012	**
	(0.004)		(0.002)		(0.006)		(0.004)	
Household is married-couple family	-0.197	*	0.198	***	0.769	***	0.236	*
(ref. Other family/nonfamily types)	(0.084)		(0.042)		(0.126)		(0.098)	
Household has children	-0.068		-0.050		0.096		-0.680	***
(ref. Does not have children)	(0.091)		(0.047)		(0.138)		(0.124)	
Household has at least one person age 65+	-0.269	*	-0.164	**	-0.303		-0.385	**
(ref. no one is age 65+)	(0.118)		(0.059)		(0.173)		(0.138)	
At least one person in the home has a disability	0.398	***	0.058		0.102		0.435	***
(ref. No one has a disability)	(0.085)		(0.048)		(0.128)		(0.104)	
Region (ref. Northeast)								
Midwest	-0.073		0.132	*	0.449	*	0.055	
	(0.126)		(0.062)		(0.191)		(0.136)	
South	0.083		0.251	***	0.095		-0.086	
	(0.111)		(0.057)		(0.191)		(0.129)	
West	0.188		0.306	***	1.012	***	0.408	**
	(0.116)		(0.062)		(0.189)		(0.132)	
Intercept	-3.818	***	-2.564	***	-5.421	***	-3.693	***
	(0.240)		(0.134)		(0.433)		(0.297)	

NH = Non-Hispanic. RV = recreational vehicle.
****p<.001; **p<.01; *p<.05.*
Source: Authors’ tabulations of the 2017 American Housing Survey

Multivariate Analyses: Housing and Residential Characteristics and Preparedness

What is the association between housing and residential characteristics and disaster preparedness? For brevity, the most consistently significant findings across the multivariate models in exhibits 3a through 6 are highlighted. On all but one of the resource-based outcomes (having emergency supplies readily available in case of evacuation), owners are significantly more prepared than renters, controlling for relevant characteristics (see exhibits 3a and b).[2] With respect to action-based preparedness, owners are more likely than renters to first turn to the radio, television, internet, or other sources, relative to relying on family and friends as information sources in the event of a disaster (see exhibit 5). In terms of where they would report they would stay if evacuated, owners are more likely than renters to report that they would evacuate to a hotel or use an RV, relative to staying with relatives and friends (exhibit 6). However, they are less likely than renters to report that they would evacuate to a shelter or another place, compared to staying with relatives and friends (exhibit 6).

The results show that the type of building in which the unit is located shows consistent and statistically significant associations with household preparedness. Regarding resource-based preparedness, exhibit 3a reports that households living in units in buildings with at least two apartments are significantly less likely than those living in single, detached units to have enough nonperishable food and water per person and emergency supplies ready in case of an evacuation. Exhibit 3b shows that only those in mobile homes, trailers, RVs, or other types of units are significantly less likely than those in single, detached family units to have evacuation funds up to $2,000 (columns 1 and 2). Column 2 shows that households in single, attached family units, mobile and related homes, and buildings with at least two apartments are significantly less likely than those in single, detached family homes to have reliable vehicles that they could use in the event of an evacuation, controlling for relevant factors. Column 3 indicates that those in single, attached family units and those in buildings with at least two apartments are significantly less likely than those in single, attached family homes to have generators available. Exhibit 4 reveals that only those in mobile homes, trailers, RVs, or other types of units are significantly less likely than those in single, detached family units to have flood insurance (columns 1 and 2). Concerning action-based preparedness, however, exhibits 5 and 6 show that the type of building in which the unit is located has little meaningful impact on the first source of information households would turn to in the event of a disaster or on the nature of the place to which they would evacuate.

With respect to the adequacy of the housing unit, exhibits 3a, 3b, and 4 show that households living in moderately or severely inadequate housing units are significantly less likely than those living in adequate housing to be prepared for disasters on all resource-preparedness outcomes except for having a generator and flood insurance. Exhibits 5 and 6 reveal that housing adequacy affects only one of the action-based preparedness measures, evacuation location plans. Those households living in moderately or severely inadequate housing are significantly more likely than those in adequate housing to report that they would evacuate to a shelter or other place relative to staying with relatives or friends (columns 1 and 4 of exhibit 6).

[2] Just as a reminder to the reader, the analyses in exhibit 4 for flood insurance are only for owners, so no comparison with renters is shown.

Regarding the results examining characteristics gauging the quality of neighborhoods in terms of crime and risk of a disaster, exhibit 3a shows that households that agree their neighborhood has serious crime are significantly less likely than those who disagree with having enough nonperishable food, controlling for other factors (column 1). Households who perceive their neighborhood as at risk of a disaster are significantly more likely than those who do not perceive their neighborhoods at risk to have emergency supplies readily available to take with them in the event of a disaster (column 4). However, perceptions of serious crime and neighborhood risk are not associated with the other resource-based outcomes in exhibit 3a. Exhibit 3b reveals that those who agree that serious crime is present in their neighborhoods are significantly less likely than those who disagree with having evacuation funds or vehicles available, controlling for other factors (columns 1 and 2). Those perceiving the neighborhood at risk of a disaster are more likely than those not perceiving the neighborhood at risk to have a generator (column 3). Exhibit 4 reveals that households with a perception that their neighborhood is at risk of a disaster are significantly more likely to have flood insurance, regardless of reasons, relative to those who do not perceive their neighborhood is at risk of a disaster (columns 1 and 2). Perceptions of serious crime are not significantly associated with the flood insurance indicators. Exhibit 5 shows that perception of crime is not associated with the source of information households would use in a disaster. Those households who believe their neighborhood is at risk of a disaster are significantly more likely than those who do not believe their neighborhood is at risk to get their information about an impending disaster from the radio or other sources relative to relying on family and friends, controlling for other factors (columns 1 and 4). Exhibit 6 shows that those households who agree serious crime is present in their neighborhood are significantly more likely than those who disagree to evacuate to a shelter compared with staying with relatives and friends (column 1); however, neighborhood risk is not associated with potential evacuation location.

Control Variables

With respect to socioeconomic and demographic variables, their associations with disaster preparedness outcomes generally conform to those found in the previous literature, but the results are not always consistent for every outcome. The variables with consistent associations with preparedness are poverty, nativity status, householder age, and disability status. For example, households in poverty are significantly less likely to be prepared in terms of having resources such as evacuation funds, a vehicle, and a generator (except in terms of having an adequate supply of water, an indicator on which they are more prepared), controlling for other factors. A similar pattern is present for households containing at least one person with a disability. Region of residence is associated with disaster preparedness, but the nature of the relationships is not the same across all indicators.

Discussion

The main goal of this study was to examine Hispanic disaster preparedness relative to that of other racial and ethnic groups after accounting for housing tenure, other residential characteristics, and socioeconomic and demographic control variables. A secondary goal was to explore the association between housing and residential characteristics and disaster preparedness. Little research with recent data has examined Hispanic disaster preparedness or included housing and other residential variables that may explain differences in preparedness between Hispanics and other racial and ethnic groups (Rivera, 2020). These analyses use 2017 American Housing Survey (AHS) data, which includes a topical module on disaster planning, to add to the limited literature on those topics.

The bivariate results revealed that Hispanics are generally less prepared than Whites regarding resource- and action-based measures—with some important exceptions. Blacks exhibit a similar pattern relative to Hispanics on those characteristics, but Asians rate their preparedness similarly to Whites. Specifically, Hispanics and Blacks are less prepared than Whites regarding having enough nonperishable food, evacuation funds up to $2,000, available evacuation vehicles, and a generator. Hispanics, Blacks, and Asians are significantly more likely than Whites to have at least 3 gallons of water per person, and Hispanics and Blacks are significantly more likely than Whites and Asians to have flood insurance. Although Hispanics and Asians are equally as likely as Whites to have emergency supplies readily available to take with them if they have to evacuate from their homes, Blacks are significantly more likely than Whites to have such emergency supplies. The action-based measures reveal some notable differences. In terms of where groups get their emergency information during a disaster, Hispanics and Blacks are significantly less likely to get their information about disasters from the internet than are Whites. Hispanics are significantly more likely than Whites to get their information from their family and friends. Blacks are significantly more likely than Whites to get their information from television. As far as where groups plan to stay if they are forced to evacuate from their homes for at least 2 weeks, Hispanics, Blacks, and Asians are significantly more likely to stay in a shelter and less likely to stay in a hotel or RV relative to Whites.

The results from the multivariate analyses of these disaster-related outcomes that controlled for socioeconomic, demographic, and housing and residential characteristics showed few changes in the nature of those differences. On the other main resource-based outcomes—enough nonperishable food, emergency evacuation funds, an emergency evacuation vehicle, and the presence of a generator—Hispanics and Blacks remained disadvantaged in their preparedness relative to Whites. Hispanics, Blacks, and Asians were significantly more likely than Whites, however, to have an adequate water supply for all of the persons in their households. Hispanics and Blacks were significantly more likely than Whites to have flood insurance. The findings regarding racial and ethnic differences in action-based preparedness—where households get their emergency information during a disaster and where they plan to stay if they are forced to evacuate—were also similar to the descriptive analysis.

With respect to the secondary objective of examining how housing and residential characteristics are associated with the disaster preparedness of households, the findings show that they are consistently significant in predicting preparedness, controlling for other relevant variables. Housing tenure is critical in that regard. Owners are significantly more likely than renters to be prepared on all outcomes except having emergency supplies readily available to take with them if they evacuate from their homes. Households living in buildings with two or more units, in moderately or severely inadequate homes, and who agree that their neighborhoods have serious crime generally are significantly less prepared than households living in single, detached housing units, adequate homes, and households who disagree that serious crime is present in their neighborhoods, respectively. Households living in neighborhoods at risk of disasters are generally more prepared in terms of resource-based outcomes than those who do not live in neighborhoods at risk.

Overall, while these analyses have demonstrated the importance of considering the housing and residential characteristics of housing units as they are associated with the disaster preparedness of households, those characteristics do not seem to attenuate the disadvantages that Hispanics and Blacks face in their disaster preparedness relative to Whites. Some limitations with this analysis could play a role. Household wealth cannot be controlled for in this analysis, and the significant inequalities in wealth faced by Hispanics and Blacks relative to Whites likely contribute to their lack of disaster preparedness because of the place-based inequalities that cause such wealth disparities (Bocian, Li, and Ernst, 2010; JCHS, 2020; Rothstein, 2017; Rugh, 2014). The AHSs do not contain information about the English proficiency of householders. Other studies have demonstrated the importance of English proficiency in the recovery from disasters, and the results of this study may somewhat overstate the gap in preparedness between Hispanics and Whites, given that researchers cannot control for that variable (Fussell et al., 2018). Also missing from these analyses are measures of the self-efficacy and the collective efficacy of households because those variables are not available in the 2017 AHS data. Racial and ethnic differences in self-efficacy and collective efficacy perceptions could also contribute to the differences between Hispanics and Whites in their disaster preparedness (Basolo, Steinberg, and Grant, 2017; DeYoung and Peters, 2016; McIvor, Paton, and Johnston, 2009). Households likely have different perceptions of the efficacy and collective efficacy of their communities in preparing for disasters, which could explain why they are less likely to prepare for such disasters.

These results clearly demonstrate that much more work needs to be done to link Hispanic disaster preparedness to the underlying racial and ethnic inequalities in housing and residential location (Bocian, Li, and Ernst, 2010; JCHS, 2020; Rothstein, 2017; Rugh, 2014). The housing inequalities that exist for Hispanics and Blacks ultimately make them less prepared for disasters, and future research would profit from including differences in wealth and collective efficacy—two factors that relate to housing and residential place-based disparities in analyses of disaster preparedness. In addition, another direction for future research is to examine whether the disaster preparedness of Hispanics and other racial and ethnic groups differs between owners and renters. In other words, would Hispanic owners be more prepared than their renter counterparts, or does the association between housing tenure and the preparedness of households depend on particular racial and ethnic groups? Finally, future research that links historical data on disasters with the AHS preparedness data would significantly advance research on this topic. Measures of experience with disasters are superior in examining household disaster preparedness than are measures of households' perceptions of the risk of their neighborhoods.

In an era of increasing billion-dollar disasters, these results make clear that Hispanics and Blacks are at a significant disadvantage in terms of their disaster preparedness. The findings also reveal that housing and residential characteristics are an important factor in disaster preparedness, and those households who are owners, with better housing conditions and lower levels of crime, and in units that are single-family, detached housing are at an advantage. This research provides an important starting point for future research on this topic. Disaster preparedness—particularly in the form of resources, such as generators, and in action plans, such as deciding in advance where to evacuate—could save lives by reducing hospitalizations due to power outages and the potential harm to individuals from major storms, floods, and wildfires. The scientific community must continue to build evidence to tackle the important charge of better preparing American households for the next disaster.

Acknowledgments

Research reported in this publication was supported by the Center for Social and Demographic Analysis at the University at Albany, SUNY, and the Population Studies and Training Center at Brown University through the generosity of the Eunice Kennedy Shriver National Institute of Child Health and Human Development (P2C HD041020).

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References

Ablah, Elizabeth, Kurt Konda, and Crystal L. Kelley. 2009. "Factors Predicting Individual Emergency Preparedness: A Multi-State Analysis of 2006 BRFSS Data," *Biosecurity and Bioterrorism: Biodefense Strategy, Practice, and Science* 7 (3): 1–14.

Acolin, Arthur, Desen Lin, and Susan M. Wachter. 2019. "Endowments and Minority Homeownership," *Cityscape: A Journal of Policy Development and Research* 21 (1): 5–62.

Al-Rousan, Tala M., Linda M. Rubenstein, and Robert B. Wallace. 2014. "Preparedness for Natural Disasters among Older U.S. Adults: A Nationwide Survey," *American Journal of Public Health* 104 (3): 506–511.

Basolo, Victoria, Laura J. Steinberg, and Stephen Grant. 2017. "Hurricane Threat in Florida: Examining Household Perceptions, Beliefs, and Actions," *Environmental Hazards* 16 (3): 253-275.

Bethel, Jeffrey W., Sloane C. Burke, and Amber F. Britt. 2013. "Disparity in Disaster Preparedness between Racial/Ethnic Groups," *Disaster Health* 1 (2): 110–116.

Bocian, Debbie Gruenstein, Wei Li, and Keith S. Ernst. 2010. *Foreclosures by Race and Ethnicity: The Demographics of a Crisis*. Durham, NC: Center for Responsible Lending.

Bourque, Linda, Rotrease Regan, Melissa M. Kelley, Michele M. Wood, Megumi Kano, and Dennis S. Mileti. 2012. "An Examination of the Effect of Perceived Risk on Preparedness Behavior," *Environment and Behavior* 45 (5): 615–649.

Burby, Raymond J., Laura J. Steinberg, and Victoria Basolo. 2003. "The Tenure Trap: The Vulnerability of Renters to Joint Natural and Technological Disasters," *Urban Affairs Review* 39 (1): 32–58.

Calem, Paul S., Leonard Nakamura, and Susan Wachter. 2011. "Implications of the Housing Market Bubble for Sustainable Homeownership." In *The American Mortgage System: Crisis and Reform*, edited by Susan M. Wachter and Marvin M. Smith. Philadelphia: University of Pennsylvania Press.

Cameron, Lisa, and Manisha Shah. 2015. "Risk-Taking Behavior in the Wake of Natural Disasters," *Journal of Human Resources* 50 (2): 484–515.

Cox, Katherine, and BoRin Kim. 2018. "Race and Income Disparities in Disaster Preparedness in Old Age," *Journal of Gerontological Social Work* 61 (7): 719-734.

Cutter, Susan, Bryan J. Boruff, and W. Lynn Shirley. 2003. "Social Vulnerability to Environmental Hazards," *Social Science Quarterly* 84 (2): 242–261.

Daviglus, Martha L., et al. 2012. "Prevalence of Major Cardiovascular Risk Factors and Cardiovascular Diseases Among Hispanic/Latino Individuals of Diverse Backgrounds in the United States." *JAMA* 308 (17): 1775–1784.

DeYoung, Sarah E., and Melissa Peters. 2016. "My Community, My Preparedness: The Role of Sense of Place, Community, and Confidence in Government in Disaster Readiness," *International Journal of Mass Emergencies and Disasters* 34 (2): 250–282.

Donahue, Amy K., Catherine C. Eckel, and Rick K. Wilson. 2014. "Ready or Not? How Citizens and Public Officials Perceive Risk and Preparedness," *American Review of Public Administration* 44 (45): 89S–111S.

Federal Emergency Management Agency (FEMA). 2020a. "National Household Survey." Washington, DC: Department of Homeland Security. https://www.fema.gov/about/openfema/data-sets/national-household-survey.

———. 2014. *Preparedness in America: Research Insights to Increase Individual, Organizational, and Community Action*. Washington, DC: Department of Homeland Security.

Fothergill, Alice, Enrique G.M. Maestas, and JoAnne DeRouen. 1999. "Race, Ethnicity and Disasters in the United States: A Review of the Literature," *Disasters* 23 (2): 156–173.

Friedman, Samantha, Joseph Gibbons, and Chris Galvan. 2014. "Declining Segregation Through the Lens of Neighborhood Quality: Does Middle-Class and Affluent Status Bring Equality?" *Social Science Research* 46: 155–168.

Friedman, Samantha, and Emily Rosenbaum. 2004. "Nativity Status and Racial/Ethnic Differences in Access to Quality Housing: Does Homeownership Bring Greater Parity?" *Housing Policy Debate* 15 (4): 865–901.

Friedman, Samantha, Hui-Shien Tsao, and Cheng Chen. 2013. "Housing Tenure and Residential Segregation in Metropolitan America," *Demography* 50 (4): 1477–1498.

Fussell, Elizabeth, Linda Delp, Kevin Riley, Sergio Chavez, and Abel Valenzuela. 2018. "Implications of Social and Legal Status on Immigrants' Health in Disaster Zones," *American Journal of Public Health* (October): e1–e4.

Harel, Ofer, and Xiao-Hua Zhou. 2007. "Multiple Imputation: Review of Theory, Implementation and Software," *Statistics in Medicine* 26 (16): 3057–3077.

Hurlbert, Jeanne S., Valerie A. Haines, and John J. Beggs. 2000. "Core Networks and Tie Activation: What Kinds of Routine Networks Allocate Resources in Nonroutine Situations?" *American Sociological Review* 65 (4): 598–618.

Iwata, Shinichiro, and Hisaki Yamaga. 2008. "Rental Externality, Tenure Security, and Housing Quality," *Journal of Housing Economics* 17 (3): 201–211.

Joint Center for Housing Studies (JCHS). 2020. *The State of the Nation's Housing 2020*. Cambridge, MA: Harvard University.

———. 2018. *The State of the Nation's Housing* 2018. Cambridge, MA: Harvard University.

Kievik, Milou, and Jan M. Gutteling. 2011. "Yes, We Can: Motivate Dutch Citizens to Engage in Self-Protective Behavior with Regard to Flood Risks," *Natural Hazards* 59 (3): 1475–1490.

Killian, Timothy S., Zola K. Moon, Charleen McNeill, Betsy Garrison, and Shari Moxley. 2017. "Emergency Preparedness of Persons over 50 Years Old: Further Results from the Health and Retirement Study," *Disaster Medicine and Public Health Preparedness* 2017: 1–10.

Klinenberg, Eric. 2002. Heat Wave: A Social Autopsy of Disaster in Chicago. Chicago, IL: University of Chicago Press.

Kuebler, Meghan, and Jacob S. Rugh. 2013. "New Evidence on Racial and Ethnic Disparities in Homeownership in the United States from 2001–2010," *Social Science Research* 42 (5): 1357–1374.

Lee, Jee Young, and Shannon Van Zandt. 2019. "Housing Tenure and Social Vulnerability to Disasters: A Review of the Evidence," *Journal of Planning Literature* 34 (2): 156–170.

Levac, Joelle, Darene Toal-Sullivan, and Tracey L. O'Sullivan. 2012. "Household Emergency Preparedness: A Literature Review," *Journal of Community Health* 37: 725–733.

Lin et al. 2021. “The Immediate Effects of Winter Storms and Power Outages on Multiple Health Outcomes and the Time Windows of Vulnerability,” *Environmental Research* 196: 110924.

Lindell, Michael K., and Ronald W. Perry. 2012. “The Protective Action Decision Model: Theoretical Modifications and Additional Evidence,” *Risk Analysis* 32 (4): 616–632.

Little, Roderick J., and Donald B. Rubin. 2019. *Statistical Analysis with Missing Data*, 3rd ed. Wiley Series in Probability and Statistics. Hoboken, NJ: John Wiley & Sons.

Logan, John R., and Harvey Molotch. 1987. *Urban Fortunes: The Political Economy of Place*. Berkeley, CA: University of California Press.

Malmin, Natasha P. 2020. “Historical Disaster Exposure and Household Preparedness Across the United States,” *Disaster Medicine and Public Health Preparedness* 15 (1): 1–7.

Maroto, Michelle. 2016. “Growing Farther Apart: Racial and Ethnic Inequality in Household Wealth Across the Distribution,” *Sociological Science* 3: 801–824.

Massey, Douglas S., and Nancy A. Denton. 1993. *American Apartheid: Segregation and the Making of the Underclass*. Cambridge, MA: Harvard University Press.

Mayock, Tom, and Rachel Spritzer Malacrida. 2018. “Socioeconomic and Racial Disparities in the Financial Returns to Homeownership,” *Regional Science and Urban Economics* 70: 80–96.

McConnell, Elizabeth Diaz. 2017. “Rented, Crowded, and Unaffordable? Social Vulnerabilities and the Accumulation of Precarious Housing Conditions in Los Angeles,” *Housing Policy Debate* 27 (1): 60–79.

McIvor, David, Douglas Paton, and David Johnston. 2009. “Modelling Community Preparation for Natural Hazards: Understanding Hazard Cognitions,” *Journal of Pacific Rim Psychology* 3 (2): 39–46.

Murphy, Sheila T., Michael Cody, Lauren B. Frank, Deborah Glik, and Alfonso Ang. 2009. “Predictors of Emergency Preparedness and Compliance,” *Disaster Medicine and Public Health Preparedness* 3: S1–S9.

Noe-Bustamante, Luis, and Antonio Flores. 2019. “Facts on Latinos in the U.S.” Washington, DC: Pew Research Center. https://www.pewresearch.org/hispanic/fact-sheet/latinos-in-the-u-s-fact-sheet/.

Noe-Bustamante, Luis, Mark Hugo Lopez, and Jens Manuel Krogstad. 2019. “U.S. Hispanic Population Reached New High in 2018, but Growth Has Slowed.” Washington, DC: Pew Research Center. https://www.pewresearch.org/fact-tank/2019/07/08/u-s-hispanic-population-reached-new-high-in-2018-but-growth-has-slowed/.

Nukpezah, Julius A., and Ismail Soujaa. 2018. “Creating Emergency Prepared Households—What Really Are the Determinants of Household Emergency Preparedness?” *Risk, Hazards, & Crisis in Public Policy* 9 (4): 480–504.

Peacock, Walter Gillis, Samuel David Brody, and Wes Highfield. 2005. "Hurricane Risk Perceptions Among Florida's Single Family Homeowners," *Landscape and Urban Planning* 73 (2–3): 120–135.

Peacock, Walter Gillis, Betty Hearn Morrow, and Hugh Gladwin. 1997. *Hurricane Andrew: Ethnicity, Gender, and the Sociology of Disasters*. New York: Routledge.

Peacock, Walter Gillis, Shannon Van Zandt, Yang Zhang, and Wesley E. Highfield. 2014. "Inequities in Long-Term Housing Recovery After Disasters," *Journal of the American Planning Association* 80 (4): 356–371.

Pearson-Stuttard, Jonathan, et al. 2016. "Modeling Future Cardiovascular Disease Mortality in the United States: National Trends and Racial and Ethnic Disparities," *Circulation* 133 (10): 967–978.

Pennings, Joost M.E., and Daniel B. Grossman. 2008. "Responding to Crises and Disasters: The Role of Risk Attitudes and Risk Perceptions," *Disasters* 32 (3): 434–448.

Reid, Megan. 2013. "Disasters and Social Inequalities," *Sociology Compass* 7 (11): 984–997.

Rivera, Jason. 2020. "The Likelihood of Having a Household Emergency Plan: Understanding Factors in the U.S. Context," *Natural Hazards* 104: 1331–1343.

Rothstein, Richard. 2017. *The Color of Law: A Forgotten History of How Our Government Segregated America*. New York: Liveright Publishing Company, an imprint of W.W. Norton & Company.

Rubin, Donald B. 2004. *Multiple Imputation for Nonresponse in Surveys*. Hoboken, NJ: John Wiley & Sons.

Rugh, Jacob S. 2014. "Double Jeopardy: Why Latinos Were Hit Hardest by the U.S. Foreclosure Crisis," *Social Forces* 93 (3): 1139–1184.

Sampson, Robert J. 2012. *Great American City: Chicago and the Enduring Neighborhood Effect*. Chicago: University of Chicago Press.

Smith, Adam. 2020. "2010–2019: A Landmark Decade of U.S. Billion-Dollar Weather and Climate Disasters." *Beyond the Data* blog. Washington, DC: National Oceanic and Atmospheric Administration. https://www.climate.gov/news-features/blogs/beyond-data/2010-2019-landmark-decade-us-billion-dollar-weather-and-climate.

Smith, Diane L., and Stephen J. Notaro. 2015. "Is Emergency Preparedness a 'Disaster' for People with Disabilities in the U.S.? Results from the 2006–2012 Behavioral Risk Factor Surveillance System (BRFSS)," *Disability & Society* 30 (3): 401–418.

Spence, Patric R., Kenneth A. Lachlan, and Donyale R. Griffin. 2007. "Crisis Communication, Race, and Natural Disasters," *Journal of Black Studies* 37 (4): 539–554.

Taylor, Keeanga-Yamahtta. 2019. *Race for Profit: How Banks and the Real Estate Industry Undermined Black Homeownership*. Chapel Hill, NC: University of North Carolina Press.

U.S. Census Bureau 2020. "Housing Vacancies and Homeownership (CPS/HVS): Annual Statistics: 2019 – Table 22. Homeownership Rates by Race and Ethnicity of Householder." https://www.census.gov/housing/hvs/data/ann19ind.html.

———. 2019. "2017 AHS Definitions, Accuracy, Historical Changes, and Questionnaires." https://www.census.gov/programs-surveys/ahs/tech-documentation/def-errors-changes/appendix-archive-2017.html.

———. 2018. "2017 American Housing Survey Data." Release Number CB18-TBS43. Washington, DC: U.S. Census Bureau. https://www.census.gov/newsroom/press-releases/2018/ahs.html.

U.S. Department of Housing and Urban Development (HUD). 2019. *Getting Started with the Public Use File: 2015 and Beyond*. Washington DC: HUD Office of Policy Development and Research.

Witte, Kim, and Mike Allen. 2000. "A Meta-Analysis of Fear Appeals: Implications for Effective Public Health Campaigns," *Health Education & Behavior* 27 (5): 591–615.

Zamboni, Lucila M., and Erika G. Martin. 2020. "Association of U.S. Households' Disaster Preparedness with Socioeconomic Characteristics, Composition, and Region," *JAMA Open Network* 3 (4): e206881. doi:10.1001/jamanetworkopen.2020.6881.

The Hispanic Housing Experience: A Perspective from Chile

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Abstract

This reaction article gathers six articles from "The Hispanic Housing Experience" in this issue of Cityscape *to compare them with related housing topics in Chile. Those articles cover issues seen in the United States, including* colonia *settlements, Hispanic performance in assisted housing, Housing Choice Voucher (HCV) and homeownership programs, and young White cohorts replacing old Hispanic cohorts in central neighborhoods. In Chile, related topics are informal settlements, rental and purchase housing programs, social assistance to recipients, and gentrification. Hispanics in the United States and low-skilled immigrants in Chile show a lower score in their housing experience than the remaining social groups.*

"The Hispanic Housing Experience" in this issue of *Cityscape* offers a series of empirical analyses based on up-to-date theories, methods, and reliable data. The report by Wiley, George, and Lipshutz uses spatial factorial analysis to observe "Colonias Investment Areas"—namely, those census tracts in the United States with more HUD-recognized Colonia settlements. Colonia communities are populated by Spanish speakers and their descendants. They show higher rates of unemployment and deprivation and lower rates of drinking water supply, water and sewer treatment services, paved streets, high-quality housing, and standard mortgage financing than non-Colonia areas. Colonia dwellers also have lower access to mortgage opportunities than do non-Colonia dwellers; however, federal and state policies are in place in an attempt to address their financial problems by increasing liquidity in mortgage lending markets for Colonia areas.

In Latin America, equivalent informal settlements surge during every housing crisis. They have existed since the foundation of cities, and they currently attract members of the immigrant rural or international low-skilled, homeless labor force and appear in public land or areas exposed to environmental risks. Latin American countries generally endure fiscal and monetary burdens in basic infrastructure for those areas (Fernandes, 2011). In Chile, informal settlements are populated by the lowest income quintile households or immigrant middle-income households.

Different from the United States, Chile's *campamentos* show higher rates of unemployment and deprivation, deficient drinking water supply, almost no water and sewer treatment services, no paved streets, no high-quality housing, and nearly zero standard mortgage financing compared with the rest of residents other than state vouchers to buy minimum-standard housing in segregated areas (Marcelo, Larenas, and López-Morales, 2019). Those problems are worse for settlers with irregular migratory status, for they are not on the list of potential voucher beneficiaries. *Campamento* immigrant dwellers usually do not have access to mortgage opportunities, as, besides their economic deprivation, immigrants spend a higher share in remittances abroad. Housing vouchers do not compensate for the cost of eradication and relocation in the lower opportunity areas for those recipients.

In another report, Newman and Holupka use a Blinder-Oaxaca decomposition to show the dramatic disparity in assisted-housing unit characteristics between Hispanic families and their Black and White counterparts. Across a range of measures of household size and housing overcrowding, Hispanic families in the United States have significantly less space in their housing units. As these authors claim, being a Hispanic household with children reduces the chances of receiving housing assistance by about one-third relative to Black and White families. Besides, Hispanic families are overrepresented in public housing and underrepresented in the multifamily and voucher programs.

The housing experience of Hispanics in the United States resembles that of low-skilled international immigrants in Chile; the difference is that in Chile, global immigration is very recent, as it increased from roughly 3 percent to 8 percent of the country's population between 2002 and 2017—the first sizable migratory wave into cities since the mid-20th century. Low-skilled immigrant families are overrepresented in the informal housing market and underrepresented in the formal voucher programs. Immigrants are concentrated more in the Santiago Metropolitan Region and Antofagasta in the north; they intensively experience residential segregation, housing overcrowding, and lower housing quality than other Chileans. The two most visible faces of immigrants' housing deficit are the increase in informal settlements, particularly in the north, and the surge of Santiago's overcrowded sublet housing market (Razmilic, 2019). Immigrants in Chile and Hispanics in the United States both score lower on socioeconomic and housing measurements.

McClure and Schwartz address social capital and residential mobility in the United States. In their article, households that receive the Housing Choice Voucher (HCV) are concentrated in low-opportunity areas—especially Hispanics, because they live in tracts where the household's racial or ethnic group is dominant. When they change residence while in the program, however, they often choose tracts at the same opportunity level instead of those in higher opportunity neighborhoods.

The U.S. HCV program looks like Chile's Rental Voucher Program (code DS52), which seeks to help immigrants and Chilean low-income households rent apartments or houses. The Chilean policy's maximum capped rent, however, is well below the rent prices found in the high-opportunity central areas where immigrants need to live (Soto, 2019). Thus, many DS52-eligible households, unattended by the state, are sent into informal housing arrangements and slums, whereas the less deprived ones share newly built apartments with other families. Unlike the HCV in the United States, Chile's DS52 voucher poorly assists deprived tenant households in finding a home.

In the United States, housing segregation connects with the Hispanic housing experience. Sanchez-Moyano confirms that Hispanic homebuyers often purchase homes in neighborhoods with fewer White neighbors, more economic disadvantages (as measured through poverty rates, median incomes, and median home values), and more significant racial change and economic decline. After the Great Recession, the number of Hispanics living in the suburbs grew by 33 percent. By contrast, during the same period, suburbs experienced profound changes in the nature and geography of work and new expansions of poverty. Sanchez-Moyano concludes that it is unclear what type of neighborhoods these new suburban homeowners create and to what extent discrimination, redlining, and structural inequalities limit their access to higher opportunity neighborhoods. Hence, more specific research into the outcomes of the assisted-housing purchase programs seems necessary.

Housing segregation in Chile, in a nutshell, means that the lowest income quintiles, I and II, depend on a state voucher to apply for homeownership, with minimum or no saving required (voucher code DS49). This voucher helps to buy the least expensive formal housing in very segregated spaces; however, the minimum size of those units is currently 62 square meters (667 square feet), and their construction quality has improved. Meanwhile, income quintiles III and IV—namely, lower-middle and middle classes with saving capacity—receive state vouchers to apply for bank credit and state-backed mortgages (code DS1). These groups live relatively less segregated than the previous group, but they rarely find a residence in central areas due to the soaring housing prices and often minimum dwelling size (Herrera and López-Morales, 2021). As central urban areas become exclusionary, low- and middle-income people struggle to find residences. Unlike the situation described in Sánchez-Moyano's report about the United States, suburbanization by low-skilled immigrants does not often happen in Chile.

In another report, Santiago and Leroux show the positive outcomes achieved by the HomeOwnership Program (HOP) among Hispanics in Denver, Colorado. The findings from a sample of 306 Hispanic homebuyers reveal that Hispanic HOP homeowners in the study purchased their homes with little to no downpayment, are more likely to hold 30-year fixed-rate mortgages at lower interest rates than are non-HOP homeowners, reside in larger homes with fewer maintenance issues, and live in residential neighborhoods with few rundown homes. One in five Hispanic homeowners, in Santiago and Leroux's study and nationally, had experienced a foreclosure by 2019; however, foreclosures and short sales were 25 percent higher among non-HOP Hispanic homeowners than HOP homeowners. These authors conclude that efforts by HOP to educate new buyers about desirable dwelling and neighborhood conditions, HOP's downpayment assistance, and its favorable mortgage financing at fixed rates have been successful policies among Hispanic dwellers.

Chile has no policy comparable to HOP. Still, the massive housing subsidy system begun in the 1970s draws on substantial economic discipline among voucher beneficiaries and housing debtors (Murphy, 2015). Current housing voucher programs consider the costs of social assistance to subsidized social dwellers.

Finally, whereas Sanchez-Moyano's report sees Hispanic low-income suburbanization, another report by Myers and Moctezuma reveals the opposite—namely, young Whites moving into

Hispanic central neighborhoods from which older Hispanic households now depart. Also, young Hispanic families move into areas that had been predominantly White as older White families age out of housing (due to either death or moving into communities centered on the elderly). This report's method observes 5-year data from the U.S. Census Bureau's 2015–2019 American Community Survey (ACS) to estimate changes over time that are consistent with a narrative of life-cycle progress. These authors consider data nationally and observe the Highland Park and Eagle Rock districts in the northeast areas of the City of Los Angeles showing gentrification—the opposite generational and racial dynamics playing out in the Los Angeles County region. Although Whites decline as a share of homeowners in the nation and Los Angeles County, their presence grows in Highland Park, Eagle Rock, and other districts of Los Angeles.

At a Latin American level, gentrification by the White population in central urban areas is occurring in Mexico City and in Rio de Janeiro, Brazil. Many state-funded infrastructure programs transform derelict quarters where poor indigenous or Black households live, seeking to attract White middle-class residents (López-Morales et al., 2021). In Santiago, Chile, gentrification is clearly due to socioeconomic reasons, as middle-income residents holding higher education degrees and sophisticated cultural consumption patterns arrive in several central districts (Marín et al., 2019).

This *Cityscape* issue offers an opportunity to address a comparative overview of housing policies in the United States and Chile. For the United States, reports here show a noticeably higher level of marginalization, informality, and risk exposure by Hispanic dwellers. This volume discusses several different housing policies and the variegated outcomes when they deliver housing support to Hispanics. The issue also describes an outward urban movement by Hispanics toward increasingly deprived peripheries, resembling traditional Latin American urbanization patterns. Both outcomes are currently unaddressed by existing policies. "The Hispanic Housing Experience" in *Cityscape* reveals the privileges Hispanics lack in the United States, as their residential experience data clearly shows. Despite its constraints, however, the housing experience for Hispanics in the United States is probably better than those in Chile and most Latin American cities, where housing marginality, extreme neighborhood violence, and the most basic deprivations supersede those of the United States. In Latin America, state policies sometimes reinforce housing informality and segregation.

Acknowledgments

The author would like to thank the editors of *Cityscape* for their invaluable feedback in the writing of this paper.

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References

Fernandes, Edésio. 2011. *Regularization of Informal Settlements in Latin America*. Policy Focus Report. Cambridge, MA: Lincoln Institute of Land Policy. https://www.lincolninst.edu/sites/default/files/pubfiles/regularization-informal-settlements-latin-america-full_0.pdf.

Herrera, Nicolás, and Ernesto López-Morales. 2021. "Inversionistas de Vivienda en el Gran Santiago: Una Nueva ola de Negocio Inmobiliario [Housing Investors in Greater Santiago: A New Wave of Real Estate Business]," *Scripta Nova* 25 (1). https://revistes.ub.edu/index.php/ScriptaNova/article/view/32230.

López-Morales, Ernesto, Javier Ruiz-Tagle, Jorge Blanco, Orlando Santos Jr., and Luis Salinas-Arreortúa. 2021. "State-Led Gentrification in Three Latin American Cities," *Journal of Urban Affairs*. https://doi.org/10.1080/07352166.2021.1939040.

Marcelo, Hanne, Jorge Larenas, and Ernesto López-Morales. 2019. Evaluación Programas Gubernamentales (EPG): *Programa Campamentos Ministerio de Vivienda y Urbanismo [Evaluation Of Government Programs: Campamento Program Ministry of Housing and Urbanism]*. Santiago: Direction of Budget (DIPRES), Ministry of the Treasury. https://www.dipres.gob.cl/597/articles-189330_r_ejecutivo_institucional.pdf.

Marín, Hernán, Javier Ruiz-Tagle, Ernesto López-Morales, Hernán Orozco, and Sadia Monsalves. 2019. "Gentrificación, Clase y Capital Cultural: Transformaciones Socioculturales en Barrios Peri-Centrales de Santiago de Chile [Gentrification, Class and Cultural Capital: Economic and Sociocultural Transformations in Peri-Central Neighborhoods of Santiago de Chile]," *Revista Española de Investigaciones Sociológicas* 166: 107–134. http://www.reis.cis.es/REIS/PDF/REIS_166_061549526762915.pdf.

Murphy, Edward. 2015. *For a Proper Home: Housing Rights in the Margins of Urban Chile*, 1960–2010. Pittsburgh: University of Pittsburgh Press.

Razmilic, Slaven. 2019. "Inmigración, Vivienda y Territorio *[Immigration, Housing and Territory]." In Inmigración en Chile: Una Mirada Multidimensional [Immigration in Chile: A Multidimensional Look]*, edited by Isabel Aninat and Rodrigo Vergara. Santiago: Centro de Estudios Públicos [Center for Public Studies]: 101–147. https://www.cepchile.cl/cep/site/docs/20191119/20191119093613/librocep_inmigracion.pdf.

Soto Riveros, Carolina. 2019. "El Subsidio al Arriendo como Instrumento de Integración Social Funcional: Evaluación de los Cuatro Primeros Años de Aplicación (2013–2016) [The Rental Subsidy as an Instrument of Functional Social Integration: Evaluation of the First Four Years of Application (2013–2016)]." Master's thesis, Faculty of Physical and Mathematic Sciences, Department of Industrial Engineering, University of Chile. http://repositorio.uchile.cl/handle/2250/170464.

United States Census Bureau (2021) American Community Survey 2015-2019. https://www.census.gov/programs-surveys/acs.

Refereed Papers

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Measuring Exclusionary Zoning in the Suburbs

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Abstract

When state law permits, cities and suburbs tend to adopt exclusionary zoning policies designed to keep out the less affluent. Urban scholars have long lamented the dearth of metrics for measuring the exclusionary tendencies of the policies of specific localities. The Wharton Residential Land Use Regulatory Index, published in 2008, is currently the most cited. It has many virtues, but it is hardly above criticism. The questionnaire that the authors of the Wharton Index circulated to local governments drew a 38-percent response rate.

This article offers five metrics for measuring the exclusionary tendencies of a suburb's zoning policies, as well as an aggregate metric that combines the five. Each metric assumes that the contents of the local government's published zoning map and ordinance sincerely express its policy intentions. The article applies the metrics to 37 suburbs and, in some instances, to four additional localities in three particular U.S. metropolitan areas. The three are Silicon Valley, the region with the most astronomic housing prices in the United States; Greater New Haven, Connecticut, the Frostbelt representative; and the northwestern sector of Greater Austin, Texas, one of the fastest growing metropolitan areas in the United States. Austin suburbs are found to have, as most would predict, less large-lot zoning, more small-lot zoning, and fewer restrictions on the construction of multifamily housing. The various metrics promise to help reveal differences in land-use policies across space and time.

Introduction

Thomas Hobbes and George Orwell both envisioned, in different fashions, that a powerful government would govern a large territory. Leviathan, however, can go local. Despite their low visibility, municipal zoning controls now constitute arguably the most consequential regulatory program in the United States. A century ago, local governments did too little to regulate land use. Today, as this article demonstrates, many of them severely overregulate, creating barriers to the development of less costly forms of housing. In numerous regions, most notably the West Coast and Northeast, these barriers have sent housing prices skyward.

Zoning is a principal form of government land-use regulation in many nations, including Australia, France, Germany, and Japan, but not, for example, England. The regulating entity, commonly a municipality, officially approves a map that identifies the boundaries of its various zones and promulgates an ordinance that indicates the uses permitted and forbidden in each. In 1891, Frankfurt-on-Main, Germany, pioneered the practice of zoning (Logan, 1976: 379). During the 1910s, Los Angeles and New York City were the first U.S. cities to embrace the practice (Talen, 2012: 22–36). Currently, over 90 percent of cities and suburbs in the United States, with the notable exception of Houston, Texas, engage in zoning (Pendall, Puentes, and Martin, 2006: 11). The zoning maps and ordinances of most U.S. suburbs set aside a large majority of land solely for detached houses and tend to limit the creation of mixed-use neighborhoods (Ellickson, 2021a: 1624; Hirt, 2014: 7, 49–59).

U.S. zoning practices have drawn increasing criticism, and not only for their effect on urban form. Numerous urban economists contend that, in many parts of the country, zoning restrictions have boosted housing prices (Glaeser, Gyourko, and Saks, 2005; Glaeser and Ward, 2009; Herkenhoff, Ohanian, and Prescott, 2018), distorted the allocation of the U.S. labor force (Ganong and Shoag, 2017), and reduced the national rate of productivity growth (Hsieh and Moretti, 2019). Some critics especially decry the exclusionary thrust of zoning policies. Large-lot requirements and restrictions on the building of multifamily housing can limit the residential options of households of modest income and thus the life chances of those kept out, particularly children (Chetty, Hendren, and Katz, 2016).

There have been numerous valuable empirical studies of zoning practices. In California, recent ones include Mawhorter and Reid (2018) and Furth and Gonzalez (2019). Scholars nevertheless have bemoaned the lack of metrics to quantify the stringency of zoning restrictions (Gyourko and Molloy, 2015: 1294, 1298; Herkenhoff, Ohanian, and Prescott, 2018: 90, 92).

Currently, the most respected and most-cited set of metrics is "The Wharton Residential Land Use Regulatory Index."[1] In 2008, Joseph Gyourko, Albert Saiz, and Anita Summers published the first Wharton Index (Gyourko, Saiz, and Summers, 2008). Gyourko has since worked with another set of co-authors to update the findings (Gyourko, Hartley, and Krimmel, 2019). Among the many strengths of the Wharton Index are its national scope, the breadth of its inquiry into barriers to housing production, and its sophistication. The Wharton endeavors, however, also have shortcomings. The first questionnaire that the Wharton team used to identify local practices generated a 38-percent response rate (Gyourko, Saiz, and Summers, 2008: 696). The authors also did not check the accuracy of the reports of the localities that did bother to reply. Similar problems may limit the usefulness of the second Wharton Index.

To measure the exclusionary tendency of a locality's land use controls, this article proposes, as an alternative, five separate individual metrics. The article concludes by combining the five into a single overarching metric. It applies all six to the zoning policies to 37 suburbs in three specific U.S. metropolitan areas: Silicon Valley, California; Greater New Haven, Connecticut; and the northwestern portion of Greater Austin, Texas.

[1] See, for example, Wassmer and Williams (2021).

These three metropolitan areas have markedly different housing markets. Silicon Valley, part of the peninsula that extends south from San Francisco, has become a destination of choice for national and international specialists in information technology. Silicon Valley is the priciest housing market in the United States, with tract houses built in the 1950s commonly selling, in 2020, for $2 million or more (Ellickson, 2021a: 1614). By contrast, demand for housing is soft in Greater New Haven, as in much of the U.S. Frostbelt. The median house in Greater New Haven sells for about one-tenth of what a Silicon Valley counterpart would command. For many decades, Greater Austin has been near the top of U.S. metros in terms of population growth rate. In 2019, median house prices in Greater Austin had inched up to about $300,000, a cost sufficiently low to tempt some Silicon Valley information technology specialists to explore job opportunities at, for example, Dell Computer of Round Rock, Texas, an Austin suburb.

Each proposed metric boils down a locality's complex set of land-use policies to a simple number. In brief preview, the first three metrics measure the extent of large-lot single-family zoning, of small-lot single-family zoning, and of zoning for multifamily structures. The next two metrics focus on the zoning of *undeveloped* sites. The fourth measures local tolerance of new multifamily housing at those locations. The fifth metric is particularly revelatory: it measures how localities zone privately owned but undeveloped tracts that have an area of 20-to-40 acres. The sixth metric aggregates the prior five. The appendix presents results for each of the 37 suburbs analyzed.

The six proposed metrics enable holistic assessment of localities' exclusionary inclinations. Researchers gathering data on zoning practices could apply these metrics to other metropolitan areas and across time. All metrics of zoning stringency, of course, have shortcomings. The ones proposed here give no weight to, for example, the burdensomeness of a suburb's impact fees or its willingness to impose procedural delays on developers. In most contexts, the six metrics represent a lower bound on a locality's exclusionary proclivities.

Metrics of Exclusionary Tendencies

All 41 localities studied in the three metros—37 suburbs, two counties, and portions of two central cities—impose zoning controls.[2] The denominator in the first four metrics is the jurisdiction's total residentially zoned area—the acreage in which the locality's various zones permit some residential use as-of-right.[3] Most contemporary U.S. zoning ordinances, including those of all 41 localities examined, are "noncumulative," barring residential uses in nonresidential zones (Hills and Schleicher, 2010). Some suburban zones are mixed-use, allowing, for example,

[2] The data presented in the exhibits and appendix reflect the contents of the zoning maps of 37 entire suburban municipalities: 15 in Silicon Valley, 14 in Greater New Haven, and 8 in Greater Austin. The data reported for Silicon Valley also include, in most instances, two neighborhoods of the City of San Jose (North San Jose and West San Jose) and some unincorporated areas of San Mateo and Santa Clara Counties. Also tabulated were the City of Austin's zoning policies in the northwestern portion of the city. A companion article (Ellickson, 2021a: 1638, 1650, 1667) includes maps that identify the exact areas studied.

[3] Another possible denominator, the entire land area of the locality, would be less revealing. Suppose a suburb were to have zoned exactly one-half its land exclusively for industry, and the remaining one-half solely for single-family detached houses on lots of one acre of more. In calculating the frequency of the one-acre requirement, the denominator used here—the area zoned for some sort of residential use—generates a result of 100 percent. If total land area instead were to be used as the denominator, the result would be 50 percent. Because the goal is to expose exclusionary tendencies, 100 percent in most contexts is more informative.

commercial uses as well as residential. This study treats these as residential zones. Localities' zoning maps in the three metros permit residential use on 78 percent of their total land area. In the remainder, the localities permit as-of-right only uses that are not residential—perhaps industrial, public-facility, or commercial.

The 37 suburbs studied set aside for detached single-family houses 91.0 percent of the area where they permit some sort of residential use. This is the equivalent of 70.7 percent of their total land area. Most developed nations other than the United States are less inclined to treat the detached house as royalty (Hirt, 2014: 6–7, 17–25).

Metric One: The Incidence of Large-Lot Zoning

Commentators commonly associate exclusionary zoning with a locality's insistence that the builder of a new detached house site it on a lot large in area (Boudreaux, 2016). Particularly in New England suburbs, American house-owners commonly live in neighborhoods where lots exceed 10,000 sq. ft. Ten thousand square feet is 0.23 of an acre (43,560 square feet), or 0.09 of a hectare. In a U.S. neighborhood where lots are larger than 10,000 sq. ft., sidewalks are uncommon, "walk scores" (Speck, 2012: 25–28) are low, and dependence on automobiles is close to universal. To justify their large-lot mandates, U.S. suburbs, especially ones that fail to provide sanitary sewers, commonly invoke a public health rationale, namely, the need for a lot large enough to permit safe disposal of septic-tank effluents.

A simple metric for measuring exclusionary zoning is the percentage of residentially zoned land that a locality places in zones that require house-lots greater than, or equal to, a particular size. Exhibit 1 presents, for minimums ranging from one-half acre to two acres, results for the three metropolitan areas. (Many suburbs treat 40,000 sq. ft. [0.92 acre] as the equivalent of an acre. The counts in exhibits 1 and 2 do as well.)

Exhibit 1

Metric One: Percentage of Residentially Zoned Land Requiring a Lot-Size Above a Specified Minimum

	≥ 1/2 acre (%)	≥ 1 acre (%)	≥ 1-1/2 acres (%)	≥ 2 acres (%)
Silicon Valley	52.8	51.0	36.1	36.1
Greater New Haven	76.1	74.0	47.7	32.0
Greater NW Austin	32.3	32.1	13.7	13.7

Source: Author's calculations based on research findings

The New Haven area, where 74 percent of the residentially zoned land in the suburbs is restricted to single-family detached houses on lots of one acre or more, leads the three metros in large-lot zoning. Municipalities in the Austin area are, by this metric, the least prone to exclude. No surprise there. Silicon Valley's results are middling. The huge lot-size requirements that San Mateo and Santa Clara Counties impose in Silicon Valley's foothill and mountain areas much affect that region's figures (Ellickson, 2021a: 1628).

Exhibit 2 reports how commonly specific localities in the three metropolitan areas require a lot of one acre on land where they permit some residential use. Each metro has at least one suburb that places over 99 percent of its land in these zones, and also one or more that declines to place any in that category. Exhibit 2 also indicates for each metro, in brackets, the municipality with the greatest amount of acreage in one-acre zones.

Exhibit 2

Municipalities with the Highest, Median, and Lowest Percentages of One-Acre Minimum House-Lot Zoning in Their Residential Zones

	Highest Percentage (%)	Median Percentage (%)	Lowest Percentage (%)
Silicon Valley*	Atherton (100), Los Altos Hills (100) [most acres: Portola Valley]	Cupertino (24)	Five cities with 0, including Menlo Park and Sunnyvale
Greater New Haven	Bethany (100) [most acres: Guilford]	Hamden (61)	West Haven (0)
Greater NW Austin*	West Lake Hills (99) [most acres: Georgetown]	Leander (38)	Rollingwood (0)

**Excludes unincorporated areas and neighborhoods in the cities of Austin and San Jose.*
Source: Author's calculations based on research findings

Metric Two: Zoning to Permit Detached Houses on Small Lots

Some commentators equate exclusionary zoning with requirements for multi-acre single-family lots. This is not correct. U.S. suburbs vary enormously in their willingness to tolerate the development of detached houses in subdivisions where lots are small. A suburb requiring one-half-acre lots in all single-family neighborhoods might be able to exclude homebuyers of modest income as successfully as one requiring 5-acre lots.

A larger house-lot tends to command a higher price, but, beyond 8,000 sq. ft. or so, not by much at the margin (Glaeser and Gyourko, 2002: 26–28; White, 1988: 380 [providing a graph showing the falloff in lot value as lot-size increases]). A larger lot provides more privacy, room to expand, and gardening options. But small-lot subdivisions also have advantages. A neighborhood with a finer grain (Lynch, 1981: 265–68) typically offers more nearby playmates for children, greater visual and social variety, and a higher walk score. It also enables utility companies to exploit efficiencies of scale, reducing utility costs.

U.S. Census Bureau (2017) data indicate that 38 percent of new U.S. single-family houses sold in 2017 were sited on lots less than 7,000 sq. ft. in area, and 62 percent, on lots less than 9,000 sq. ft. In New England, however, a bastion of exclusionary zoning, the median house-lot of a new detached dwelling was 17,000 sq. ft., roughly twice the national figure (Siniavskaia, 2017). U.S. house-lots tend to be larger than those in, for example, England, France, and Germany, in part because U.S. dwellings on average are roughly twice as spacious (Hirt, 2014: 23).

In 2014, France, to help assure that nation's residents access to dense residential neighborhoods, enacted a statute that prohibits municipalities from setting minimum sizes for house-lots (Noguellou, 2016 [citing Code de l'Urbanisme, § 123-1-5]). In the United States, where states and localities traditionally have controlled land use policy, a national limit on lot sizes, as a political matter, is virtually inconceivable.

Metric Two measures localities' tolerances—in their zoning ordinances—of small house-lots for detached houses. The denominator, as usual, is the total acreage in zones that allow some residential use as-of-right. The numerator is the zoned acreage that would permit house-lots as small as the stated size. Exhibit 3 presents gross findings for the three metropolitan areas for lots of three relatively modest sizes: 6,000, 8,000, and 10,000 sq. ft.

Exhibit 3

Metric Two: Percentage of Residentially Zoned Acreage Permitting Single-Family Detached Houses on Lots Below a Specified Minimum

	≤ 6,000 sq. ft. (%)	≤ 8,000 sq. ft. (%)	≤ 10,000 s.f. (%)
Silicon Valley	20.5	24.9	32.3
Greater New Haven	0.2	1.0	3.6
Greater NW Austin	24.8	39.5	49.0

Source: Author's calculations based on research findings

Exhibit 3 identifies a stunning outlier. New Haven suburbs, honoring a distaste widely shared in New England, are vastly the harshest on would-be developers of subdivisions of modestly sized house-lots. Only one New Haven suburb, Milford, allows more than 2 percent of its residentially zoned territory to be developed into 8,000 sq. ft. lots. By contrast, the Silicon Valley cities of East Palo Alto, Sunnyvale, and the City of Santa Clara allow 8,000 sq. ft. house-lots on an average of 71 percent of their residentially zoned land. In two Austin suburbs, Cedar Park and Round Rock, the average rises to 79 percent. New England's hostility to walkable suburban neighborhoods is exceptional (Ellickson, 2021a: 1625, 1630).

Exhibit 4 helps unpack the gross data presented in exhibit 3. It reports only on suburbs' tolerances of houses on 8,000 sq. ft. lots.

Exhibit 4

Percentage of Residentially Zoned Land Permitting 8,000 Sq. Ft. House-Lots, or Less

	Highest Percentage (%)	Median Percentage (%)	Lowest Percentage (%)
Silicon Valley*	East Palo Alto (81.6%) [most acres: Sunnyvale]	Palo Alto (36.1%)	Four tied at 0%: Atherton, Los Altos, Los Altos Hills, Woodside
Greater New Haven	Milford (14.7%) [most acres: Milford]	0%. Only 3 of the 14 suburbs have a single-family zone allowing 8,000 sq. ft. house-lots	11 tied at 0%.
Greater NW Austin*	Round Rock (79.5%) [most acres: Georgetown]	Leander (24.9%)	Three tied at 0%: Bee Cave, Rollingwood, West Lake Hills

**Excludes unincorporated areas and neighborhoods in the cities of Austin and San Jose.*

Source: Author's calculations based on research findings

Metric Three: Zoning that Permits Multifamily Housing As-of-Right

Denser residential developments tend to be more affordable. Examples are apartment buildings, townhouses, and parks offering hookups for manufactured housing (mobile homes). Knapp et al. (2007) have analyzed barriers to building multifamily housing in six metropolitan regions, and Schuetz (2009, 2008) has focused on comparable efforts by Boston suburbs.

Metric Three tallies, for the various localities, the percentage of residentially zoned land on which a developer, as-of-right, could build one of these various types of denser housing at a density of at least eight gross dwelling units per acre. In all three metros, localities' zoning ordinances commonly assert that a would-be developer of a dense project has to apply for and receive a discretionary permit. This analysis assumes, however, that if a locality had gone so far as to name its zone "multifamily," "townhouse," "mobile home," or the like, it would grant the permit, a generous assumption.

Exhibit 5 indicates the percentage of residentially zoned land where zoning authorities in the three metros permit multifamily use, thus defined. As exhibit 5 implies, Silicon Valley is residentially denser than the other two metros. It also reveals that New Haven suburbs are especially hostile to multifamily development.

Exhibit 5

Metric Three: Percentage of Residentially Zoned Land Permitting Multifamily Use, Both Developed and Undeveloped Sites

Silicon Valley	10.0%
Greater New Haven	1.4%
Northwest Austin	6.0%

Source: Author's calculations based on research findings

To provide more texture, Exhibit 6 indicates variations in municipal policies governing the building of multifamily housing.

Exhibit 6

Municipalities with the Highest, Median, and Lowest Percentages of Multifamily Zoning in Their Residentially Zoned Area

	Highest Percentage (%)	Median Percentage (%)	Lowest Percentage (%)
Silicon Valley*	Mountain View (41.4%) [most acres: Sunnyvale]	Palo Alto (8.4%)	Tied at 0%:Atherton, Los Altos Hills, Woodside
Greater New Haven	Meriden (8.9%) [most acres: Meriden]	North Haven (1.0%)	Tied at 0%: Bethany, Branford, Madison, North Branford, Orange
Greater NW Austin*	Bee Cave (12.8%) [most acres: Cedar Park]	Leander (4.1%)	Tied at 0%: Rollingwood, West Lake Hills

** Excludes unincorporated areas and neighborhoods in the cities of Austin and San Jose.*

Source: Author's calculations based on research findings

Metric Four: Undeveloped Parcels Zoned for Multifamily Use

The fourth and fifth metrics measure the zoning policies that localities apply to undeveloped land. Both require a researcher to make a judgment about the extent of a particular parcel's development. For Metrics Four and Five, the aerial photographs available on Google Earth were used to decide the matter.[4] At times difficult to apply, the decision rule was whether buildings, asphalt, or intensive landscaping covered at least 50 percent of the parcel area. If so, it was deemed "developed" and, if not, "undeveloped." The payoff to this extra work is a deeper insight into the realities of zoning policies.

To ease the comparison of localities' zoning practices on developed and undeveloped multifamily land, the first column in exhibit 7 repeats data reported in exhibit 5.

Exhibit 7

Metric Four: Undeveloped Residentially Zoned Land Permitting Multifamily Use

	Both Developed and Undeveloped Sites (%)	Undeveloped Sites Only (%)
Silicon Valley	10.0	0.2
Greater New Haven	1.4	0.3
Northwest Austin	6.0	2.2

Source: Author's calculations based on research findings

Although localities in Silicon Valley show the greatest willingness to zone for multifamily development, virtually all of the lands that they zone in that fashion already have multifamily structures on them. The most notable finding in exhibit 7 is that undeveloped multifamily land is roughly 10 times more commonly available in the northwestern Austin sector than in the other two metros. In the three metros, the municipalities with the highest percentages of undeveloped residential land currently zoned for multifamily use were East Palo Alto, California (2.8 percent), Meriden, Connecticut (2.7 percent), and Bee Cave, Texas (7.3 percent). A multifamily housing developer looking for a permissibly zoned and undeveloped site would find fewer acres of it in the entire Silicon Valley than in any one of four suburbs northwest of Austin: Cedar Park, Georgetown, Leander, and Round Rock.

Metric Five: The Zoning of Large Undeveloped Private Tracts

A local government typically has greater freedom to change the zoning rules applicable to a large tract of undeveloped land. Consider a neighborhood that a locality had zoned solely for detached houses. Once developers had actually built houses complying with a minimum-lot requirement, local politics would make the suburb highly unlikely to rezone the neighborhood to permit greater residential density. A rezoning of that sort not only would threaten to waste some of the capital previously invested in detached houses but also likely would stir up greater opposition from homeowners (Ellickson, 2021b). When homeowners are not present in a neighborhood, a suburb has more freedom in choosing how to zone it.

[4] An alternative, not used for this study, would be the National Land Cover Database (2016).

Exhibit 8 reveals how localities in the three metros zone a tract of land that satisfies all of the following four criteria:

- It is mostly undeveloped.
- It is zoned to permit residential development.
- Its area is between 20 and 40 acres (roughly four to eight city blocks).
- It is owned privately, but not by a nonprofit corporation such as a country club.

Exhibit 8

Metric Four: Zoning of Residentially Zoned, Privately Owned, and Mostly Undeveloped Tracts of 20-to-40 Acres

	Silicon Valley	Greater New Haven	Greater NW Austin
Number of Qualifying Tracts	57	242	123
% Zoned for House-Lots of at Least One-Acre	96.5	90.9	41.5
% Zoned Multifamily or for House-Lots ≤ 8,000 sq. ft.	3.5	0.4	50.4
% Zoned Multifamily	1.8	0.4	17.1

Source: Author's calculations based on research findings

The advent of big data has enabled this sort of inquiry. Counties maintain parcel databases through which a researcher can readily locate sites of 20-to-40 acre tracts as well as the names of their owners. Aerial photographs available on Google Earth again enabled judgments about the extent of parcel development. Both supply-side and demand-side considerations may contribute to the nondevelopment of these large tracts. They are disproportionately likely to contain steep slopes, ledge, and wetlands, and to be remote from utility lines and employment opportunities.

Tracts that satisfy all four criteria are present in only four of the fifteen suburbs in Silicon Valley. In that metro, 81 percent of these large, privately owned, and undeveloped tracts are situated high in the upper-foothill and mountain areas of Portola Valley, Woodside, and unincorporated Santa Clara County. None of those localities permits, in these locations, a house-lot of fewer than 5 acres.

The 14 suburbs in the long-settled New Haven area have many more tracts that meet the four criteria. On average, a New Haven suburb has 17 of these privately owned, residentially zoned, and undeveloped tracts of 20-to-40 acres. Each town has at least two. Exhibit 8 indicates that New Haven suburbs require a house-lot of at least one acre on 90.9 percent of these undeveloped tracts. That figure far exceeds 74.0 percent, the overall large-lot proclivity of New Haven suburbs (see exhibit 1). Having fired the first barrel of the exclusionary shotgun, New Haven suburbs also fire the second. They permit house-lots of 8,000 sq. ft. or less on only 0.4 percent of these large private tracts.

Municipalities in Austin's northwestern sector tolerate far more growth. They zone 33.3 percent of privately owned, undeveloped parcels of 20-to-40 acres to permit subdivisions of house-lots no larger than 8,000 sq. ft.[5] Austin's localities also permit multifamily construction on an additional 17.1 percent of these large undeveloped tracts. That percentage is almost three times 6.0 percent, the general tolerance of Austin localities for multifamily housing (see exhibit 5). In sum, on 50.4 percent of their spacious greenfield sites, Austin suburbs permit the development of either small house-lots or multifamily housing. That percentage is roughly 10 times greater than Silicon Valley's percentage and 100 times greater than that of the New Haven suburbs.

Aggregating the Five Metrics into an Overarching Metric

There are numerous methods of combining the five metrics just introduced. This article uses a simple one. It gives equal weight to each of five metrics: the percentage of residentially zoned land requiring house-lots of at least 40,000 sq. ft. (just shy of one acre); the incidence of zoning permitting 8,000 sq. ft. lots (or even higher residential density); the acreage zoned for multifamily development; the availability of undeveloped multifamily land; and the zoning of residentially-zoned, undeveloped, private parcels of 20-to-40 acres. For each of the five metrics, the author ranked the 37 suburbs from the most exclusionary to the least exclusionary. A suburb's aggregate metric is the average of its rankings.[6] The appendix presents results for all 37 suburbs examined.

This system of aggregation identified two Silicon Valley suburbs—Atherton and Los Altos Hills—as the most exclusionary of the 37. Silicon Valley also contains the three least exclusionary municipalities. In order, they are East Palo Alto, Campbell, and Sunnyvale. East Palo Alto requires a house-lot of only 5,000 sq. ft., while Atherton and Los Altos Hills uniformly require one acre, more than eight times more. East Palo Alto, however, is hardly a pushover for developers. East Palo Alto is firmly opposed to the densification of its existing single-family neighborhoods (Ellickson, 2021b: 407). In both suburbs and central cities, Not In My Backyard sentiment (NIMBYism) arises virtually everywhere.

The appendix rankings present few surprises to those who have perused the prior exhibits. Five of the eight Austin suburbs rank in the bottom third of exclusionary bent, as do 7 of the 15 in Silicon Valley. Of the 14 New Haven suburbs, only West Haven falls in the bottom third, and Bethany ranks as the most exclusionary.

Discussion

This article, part of a larger research project on zoning practices, proposes several metrics for measuring a suburb's exclusionary inclinations. In carrying out the research, I selectively read the texts of 41 local zoning ordinances, totaling some 10,000 pages. The principal goal was to calculate the acreages that localities' zoning maps placed in various residential zones. Total research time averaged over 8 hours per locality. Complications inevitably arose. Municipalities vary, for

[5] Georgetown, Texas, the oldest and least pro-development of the four suburbs in Williamson County north of Austin, authorizes the subdivision of 35 percent of its 48 large, undeveloped private tracts into house-lots as small as 5,500 sq. ft.

[6] Eleven Silicon Valley suburbs and three in Austin lack undeveloped tracts of 20-to-40 acres. In these instances, the rankings on the other metrics were divided by four, not five. Another approach, more time-consuming but arguably more accurate, would have averaged a suburb's standard deviation on the first five metrics.

example, in whether they define the area of a zone to include street rights-of-way. This complicated interjurisdictional comparisons. More than one-half of the research time was devoted to the calculation for Metrics Four and Five, the two that required a judgment about whether a particular parcel had or had not been developed.

Each suggested metric assumes that a locality's zoning map and ordinance sincerely express its future policy intentions. Other scholars of zoning have been willing to adopt that premise (for example, Glaeser and Ward, 2009: 267–68). Because a municipality retains the power to amend its map and ordinance, skeptics might contest that assumption. However, this research project revealed that zoning maps and ordinances are surprisingly static, particularly in the already developed single-family neighborhoods that make up most of the urban United States (Ellickson, 2021b).

Many simplifications are inevitably necessary to boil down a policy as complex as a zoning ordinance to a simple number. This article ignores, for example, both nonconforming uses and possible local awards of zoning variances. The popularity of planned unit development (PUD) zones poses special complications. The PUD variant, which first flowered in the United States during the 1960s, invites a developer owning a large tract to propose a mix of land uses, perhaps including multifamily housing (Mandelker, 2008). After bargaining, the locality signs off on the deal. Fast-growing Round Rock, Texas, has placed 30 percent of its residentially zoned land in PUD zones, the most of any of the 37 suburbs studied. The City of Santa Clara, California, with 18 percent, topped Silicon Valley. Identification of the residential components of these PUDs compelled resort to various online records.

In some applications, the proposed metrics may be misleading (Ellickson, 2021a: 1623). Orange, Connecticut, for example, has repeatedly increased the required acreage in its basic single-family zone. Orange, however, is both unwilling and unable to enforce its increased house-lot minimum against a nonconforming homeowner. The metrics thus exaggerate the exclusionary tilt of Orange's zoning restrictions. By contrast, the metrics likely underestimate the pro-growth inclinations of Round Rock, Texas. Round Rock's population exploded, partly because of annexations, from 3,000 in 1970 to an estimated 133,000 in 2019. The metrics understate Round Rock's proclivity of rezoning for denser PUD development. Any set of metrics invariably simplifies.

Conclusion

The first three metrics offered here, the easiest to calculate, indicate how commonly a locality insists on large house-lots, permits small house-lots, and allows the construction of multifamily housing. Metrics Four and Five, which focus on the zoning of undeveloped land, require more investigation but commonly reveal more. They demonstrate that, on undeveloped private land, Austin's northwestern suburbs have been particularly tolerant of both new multifamily development and small house-lots. Absent those policies, the population of Greater Austin would not have been exploding.

There are, of course, many methods of measuring whether zoning policies have an exclusionary bias. Some commentators stress, for example, the value of so-called "missing middle" forms of housing (Parolek, 2020). These include duplexes, triplexes, and other residential structures potentially compatible in scale to nearby detached houses. By that measure, the standout among the suburbs studied was East Haven, Connecticut, which allows duplexes on 39 percent of its residentially zoned land. If developers were to build more of these structures, "missing middle" housing might become worthy of having its own metric.

The principal value of zoning metrics is enabling comparison of local land-use practices across both space and time. A researcher could use the metrics offered here, time-consuming though they may be to calculate, to compare the zoning policies of a Greater Denver, a Greater Mannheim, or a Greater Sydney. The suburbs northwest of the city of Austin, now generally friendly to development, may become less so in future decades. The proffered metrics provide an objective test for determining whether this will have occurred.

HUD could assemble a database on local zoning practices, one far larger than that provided here. There are about 15,000 zoning governments in the United States, most of which post their zoning maps and zoning ordinances online. Because of the tepid response rates to the Wharton Index questionnaires, the value of sending survey instruments to local governments is questionable and complete confidence in the accuracy of local responses is not warranted. Data collection is costly. Stress on breadth means less depth. HUD might consider the merits of a deeper study into local zoning practices, not in the entire nation, but in dozens of randomly chosen metropolitan areas.

Appendix

Exhibit A-1

How Each of the 37 Suburbs Rank on the Metrics (1 of 2)

	Metric 1: % resid. zoned land requiring ≥40,000 sq. ft. house-lot	Metric 2: % resid. zoned land allowing lot of ≤8,000 sq. ft. or denser	Metric 3: % zoned multifamily ≥8 dwelling units per acre	Metric 4: % vacant land in multifamily zones	Metric 5: median required house-lot, private undeveloped tract of 20–40 acres	Metric 6: Average rank on the five metrics
Silicon Valley						
Atherton	100.0	0	0	0	-	1.5
Campbell	0	88.7	21.9	1.0	-	36.0
City of Santa Clara	0.1	99.9	26.3	0.8	-	32.0
Cupertino	23.5	60.8	7.4	0.1	3 acres	20.0
East Palo Alto	0	99.9	15.1	2.8	-	37.0
Los Altos	0	2.6	2.3	0	-	16.0
Los Altos Hills	100.0	0	0	0	-	1.5
Menlo Park	0	54.3	21.4	0.8	-	30.0
Mountain View	1.5	85.2	41.4	1.0	-	33.0
Palo Alto	51.5	46.1	8.4	0.02	-	21.0
Portola Valley	96.7	1.1	0.05	0.03	7.5 acres	7.5

Exhibit A-1

How Each of the 37 Suburbs Rank on the Metrics (2 of 2)

	Metric 1: % resid. zoned land requiring ≥40,000 sq. ft. house-lot	Metric 2: % resid. zoned land allowing lot of ≤8,000 sq. ft. or denser	Metric 3: % zoned multifamily ≥8 dwelling units per acre	Metric 4: % vacant land in multifamily zones	Metric 5: median required house-lot, private undeveloped tract of 20–40 acres	Metric 6: Average rank on the five metrics
Redwood City	0.03	87.1	25.2	0.2	-	28.0
Saratoga	56.4	1.1	1.1	0.04	2 acres	13.5
Sunnyvale	0	99.9	28.4	0.3	-	35.0
Woodside	97.3	0	0	0	5 acres	4.0
Greater New Haven						
Bethany	100.0	0	0	0	65,000 sq. ft.	5.0
Branford	44.7	10.1	3.0	0	20,000 sq. ft.	17.0
East Haven	23.2	44.1	3.2	0	40,000 sq. ft.	18.0
Guilford	92.7	1.7	0.07	0.03	160,000 sq. ft.	9.0
Hamden	60.8	6.3	3.0	0.9	40,000 sq. ft.	19.0
Madison	99.8	0.2	0.1	0	80,000 sq. ft.	7.5
Meriden	35.2	16.0	6.7	1.0	40,000 sq. ft.	24.0
Milford	20.2	23.4	4.6	0.5	1 acre	23.0
North Branford	98.5	1.3	0	0	40,000 sq. ft.	10.0
North Haven	59.5	1.4	1.0	0.1	40,000 sq. ft.	15.0
Orange	99.6	0.2	0	0	60,000 sq. ft.	6.0
Wallingford	63.7	3.3	1.0	0.1	120,000 sq. ft.	13.5
West Haven	0	31.8	7.2	1.3	20,000 sq. ft.	29.0
Woodbridge	97.8	0.7	0.5	0.2	2 acres	12.0
Northwest Austin						
Bee Cave	47.9	12.8	12.8	7.3	-	26.0
Cedar Park	4.2	81.4	10.2	5.0	5,000 sq. ft.	34.0
Georgetown	47.9	52.0	2.8	1.7	2 acres	22.0
Lakeway	2.6	28.5	1.5	0.7	10,000 sq. ft.	25.0
Leander	38.4	29.2	4.1	3.5	9,000 sq. ft.	27.0
Rollingwood	0	0	0	0	-	11.0
Round Rock	7.5	89.1	6.8	2.0	5,500 sq. ft.	31.0
West Lake Hills	98.8	0	0	0	-	3.0

Source: Author's calculations based on research findings

Acknowledgments

I thank Zachary Liscow, David Schleicher, Mark Shroder, and four anonymous referees for perceptive comments. The Oscar M. Ruebhausen Fund at Yale Law School generously provided support for this research. A more expansive, if slightly different, version of the findings appeared in 42 *Cardozo Law Review* 1611 (2021). The author is willing to allow access to all underlying data.

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References

Boudreaux, Paul. 2016. “Lotting Large: The Phenomenon of Minimum Lot Size Laws,” *Maine Law Review* 68 (1): 1–43.

Chetty, Raj, Nathaniel Hendren, and Lawrence F. Katz. 2016. “The Effects of Exposure to Better Neighborhoods on Children: New Evidence from the Moving to Opportunity Experiment,” *American Economic Review* 106 (4): 855–902.

Ellickson, Robert C. 2021a. “Zoning and the Cost of Housing: Evidence from Silicon Valley, Greater New Haven, and Greater Austin,” *Cardozo Law Review* 42: 1611-92.

———. 2021b. “The Zoning Straitjacket: The Freezing of American Neighborhoods of Single-Family Houses,” *Indiana Law Journal* 96: 395-427.

Furth, Salim, and Olivia Gonzalez. 2019. “California Zoning: Housing Construction and a New Ranking of Local Land Use Regulation,” Mercatus Center at George Mason University.

Ganong, Peter, and Daniel Shoag. 2017. “Why Has Regional Income Convergence in the U.S. Declined?” *Journal of Urban Economics* 102: 76–90.

Glaeser, Edward L., Joseph Gyourko, and Raven Saks. 2005. “Why Is Manhattan So Expensive? Regulation and the Rise in Housing Prices,” *Journal of Law and Economics* 48 (2): 331–369.

Glaeser, Edward, and Joseph Gyourko. 2002. “Zoning’s Steep Price,” *Regulation* (Fall Issue): 24–30.

Glaeser, Edward L., and Bryce A. Ward. 2009. “The Causes and Consequences of Land Use Regulation: Evidence from Greater Boston,” *Journal of Urban Economics* 65 (3): 265–78.

Gyourko, Joseph, Jonathan Hartley, and Jacob Krimmel. 2019. The Local Residential Land Use Regulatory Environment Across U.S. Housing Markets: Evidence from a New Wharton Index. Working paper 26573. NBER.

Gyourko, Joseph, and Raven Molloy. 2015. "Regulation and Housing Supply." In *Handbook of Regional and Urban Economics*. Vol. 5b, edited by Gilles Duranton, Vernon Henderson, and William Strange. Amsterdam: Elsevier: 1289–1337.

Gyourko, Joseph, Albert Saiz, and Anita Summers. 2008. "A New Measure of the Local Regulatory Environment for Housing Markets: The Wharton Residential Land Use Regulatory Index," *Urban Studies* 45 (3): 693–729.

Herkenhoff, Kyle F., Lee E. Ohanian, and Edward C. Prescott. 2018. "Tarnishing the Golden and Empire States: Land-Use Restrictions and the U.S. Economic Slowdown," *Journal of Monetary Economics* 93: 89–109.

Hills, Roderick M., Jr., and David Schleicher. 2010. "The Steep Costs of Using Noncumulative Zoning to Preserve Land for Urban Manufacturing," *University of Chicago Law Review* 77 (1): 249–273.

Hirt, Sonia. 2014. *Zoned in the USA*. Ithaca: Cornell University Press.

Hsieh, Chang-Tai, and Enrico Moretti. 2019. "Housing Constraints and Spatial Misallocation," *American Economic Journal: Macroeconomics* 11 (2): 1–39.

Knaap, Gerrit, Stuart Meck, Terry Moore, and Robert Parker. 2007. *Zoning as a Barrier to Multifamily Housing Development*. American Planning Association, Planning Advisory Service, Report Number 548.

Logan, Thomas H. 1976. "The Americanization of German Zoning," *Journal of the American Institute of Planners* 42 (4): 377–385.

Lynch, Kevin. 1981. *Good City Form*. Cambridge: MIT Press.

Mandelker, Daniel R. 2008. "Legislation for Planned Unit Developments and Master-Planned Communities," *Urban Lawyer* 40 (3): 419–449.

Mawhorter, Sarah, and Carolina Reid. 2018. "Local Housing Policies Across California," Terner Center for Housing Innovation, University of California–Berkeley.

National Land Cover Database. 2016. Available at https://www.mrlc.gov/national-land-cover-database-nlcd-2016.

Noguellou, Rozen. 2016. "La règle d'urbanisme et les PLU—Où se trouve la règle d'urbanisme?" *Revue française de droit administratif* 872, Sept.–Oct.

Parolek, Daniel G. 2020. *Missing Middle Housing: Thinking Big and Building Small to Respond to Today's Housing Crisis*. Washington DC: Island Press.

Pendall, Rolf, Robert Puentes, and Jonathan Martin. 2006. *From Traditional to Reformed: A Review of the Land Use Regulations in the Nation's 50 Largest Metropolitan Areas*. Brookings Institution.

Schuetz, Jenny. 2009. "No Renters in My Suburban Backyard: Land Use Regulation and Rental Housing," *Journal of Policy Analysis and Management* 28 (2): 296–320.

______. 2008. "Guarding the Town Walls: Mechanisms and Motives for Restricting Multifamily Housing in Massachusetts," *Real Estate Economics* 36 (3): 555–586.

Siniavskaia, Natalia. 2017. "Lot Size is at a New Record Low," National Association of Homebuilders Eye on Housing (Oct. 3) http://eyeonhousing.org/2018/08/lot-size-remains-record-low/?_ga=2.164146239.124965040.1549063508-511468845.1549063508

Speck, Jeff. 2012. *Walkable City: How Downtown Can Save America, One Step at a Time*. New York: North Point Press.

Talen, Emily. 2012. *City Rules: How Regulations Affect Urban Form*. Washington DC: Island Press.

U.S. Census Bureau, Census of Construction. 2017. https://www.census.gov/construction/chars/pdf/soldlotsize.pdf

Wassmer, Robert W., and Joshua A. Williams. 2021. "The Influence of Regulation on Residential Land Prices in United States Metropolitan Areas," *Cityscape* 23 (1): 9–36.

White, James R. 1988. "Large Lot Zoning and Subdivision Costs: A Test," *Journal of Urban Economics* 23 (3): 370–384.

Departments

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Affordable Design

The U.S. Department of Housing and Urban Development sponsors or cosponsors three annual competitions for innovation in affordable design: The Innovation in Affordable Housing Student Design and Planning Competition; the American Institute of Architects – HUD Secretary's Housing Community Design Awards; and the HUD Secretary's Opportunity & Empowerment Award, co-sponsored with the American Planning Association. This Cityscape department reports on the competitions and their winners. Each competition seeks to identify and develop new, forward-looking planning and design solutions for expanding or preserving affordable housing. Professional jurors determine the outcome of these competitions.

2021 Innovation in Affordable Housing Student Design and Planning Competition: Fresno County Housing Authority, Firebaugh, California

Alaina Stern
U.S. Department of Housing and Urban Development

The Jury:
Rob Hazelton (Head Juror)—CEO, Dominion Due Diligence Group
Stephen D. Bender—AIA, Principal, bndr, llc; Acting Program Director, University of Florida CityLab-Orlando
Michael Eriksen—West Shell Assoc. Professor of Real Estate, University of Cincinnati (UC); Academic Director, UC Real Estate Center
Karl Schoettler—Principal, Collins & Schoettler
Kia Weatherspoon—NCIDQ, ASID, President + Design Advocate, Determined By Design
Alternative Jury Member: Jaime Bordenave—Founder and President, The Communities Group

Winning Team—Pratt Institute & New York University:
Sabyasachi Das
Pankti Mehta
Nella Schools
Browne Sebright
Kats Tamanaha

Runner-Up Team—University of Michigan & Harvard University:
Andrew Darvin
Avanti Krovi
Christopher Prinsen
Alexander Sulek
Katherine Wheeler

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, the U.S. Department of Housing and Urban Development, or the U.S. Government.

Introduction

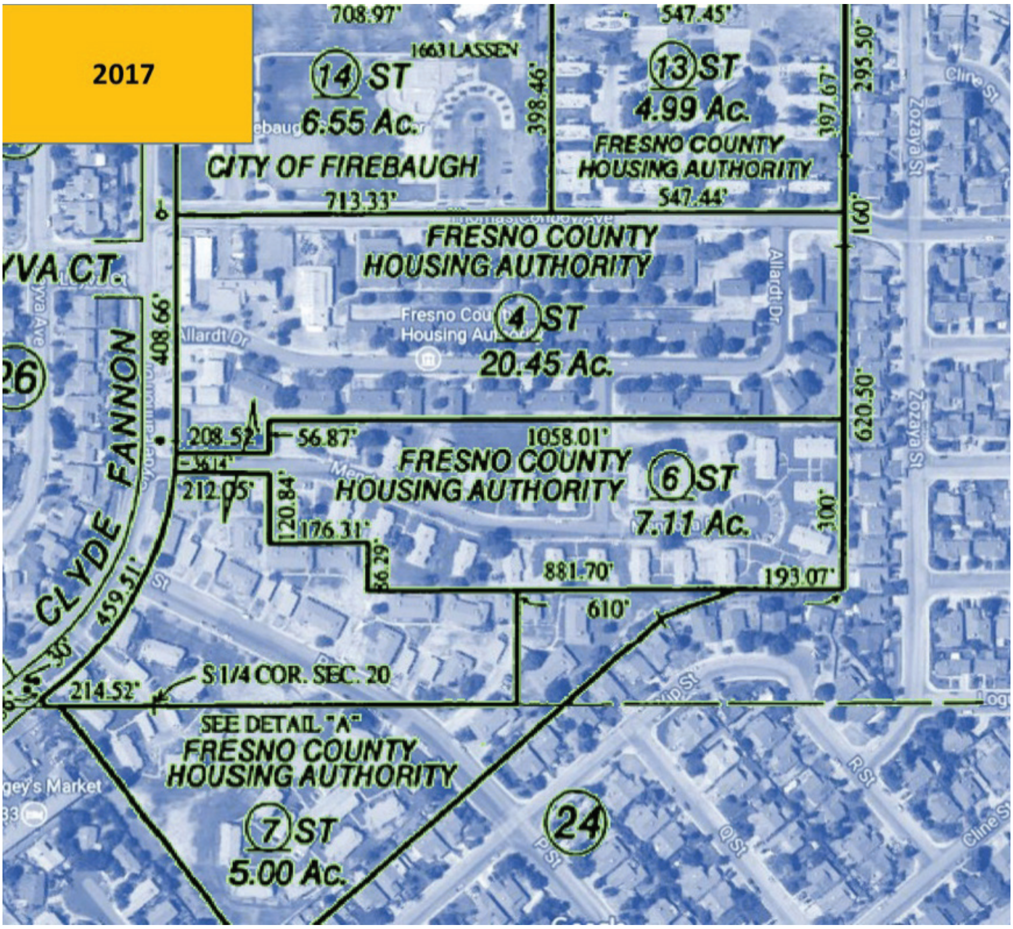
The eighth annual U.S. Department of Housing and Urban Development (HUD) Innovation in Affordable Housing (IAH) Student Design and Planning Competition challenged multidisciplinary graduate student teams to respond to an existing affordable housing design and planning issue. Teams are composed of graduate students in architecture, planning and policy, finance, business, and other disciplines. The competition challenges students to address social, economic, and environmental issues in responding to a specific housing development problem identified by a partnering public housing agency (PHA).

The overarching goal of the competition is to advance innovation in the design of affordable housing. The competitors' plans and designs must address the issues outlined by the partnering PHA. The designs should identify improvements that could be implemented at the site, and the plans must promote durability, reduce energy consumption, increase the quality of housing, and enhance the social and economic vitality of the surrounding community.

For the 2021 challenge, HUD partnered with the Fresno Housing Authority (FHA) in California. This year was the first year that HUD partnered with a rural site and provided the student teams with unique considerations and that added a layer of complexity. Teams were challenged to find innovative solutions to create a single, cohesive community from five contiguous properties in the city of Firebaugh (exhibit 1). The students were asked to redesign more than 210 units of workforce housing for farm laborers, migrant workers, senior citizens, and low-income families.

Exhibit 1

Fresno Housing's five contiguous properties, in the city of Firebaugh



Source: Fresno Housing

The Honorable Freddy Valdez, mayor of Firebaugh, describes the city of Firebaugh as a small, rural, working-class town based on agriculture, whose residents want to build more "walking and biking connections" and look forward to their community's "transformation." Michael Duarte, FHA's chief real estate officer, also aspires to resolve challenges related to the lack of connectedness and encouraged teams to focus proposals around connecting residents of the city of Firebaugh with the larger Fresno community. Firebaugh, with its near-zero vacancy rate, has a severe housing shortage; therefore, students also had to consider implications for developing a feasible, affordable housing plan to include additional units for workers in Firebaugh's agricultural industry.

FHA has provided affordable housing to low-income individuals (including seniors, veterans, farmworkers, individuals with disabilities, and more) through various programs, services, and developments since 1940. The housing authority provides stable, quality, public, and affordable housing to more than 11,000 residents (including 5,500 children) and assists nearly 50,000 residents (including 24,000 children) among their housing profile (including public housing and housing choice voucher sites). Fresno Housing hopes to complete a vision that stitches the properties together, creating a fluid, walkable community. It sees "sensitivity to place" as an important part of design for all projects. This practice ensures that its properties include special features, such as architectural adornment, art in public spaces, community gardens, gathering areas, and other elements that enhance not only the sites themselves but the neighborhoods of which they are a part.

This year's project site is a development with five contiguous properties, currently separated from each other by fencing and other barriers that prevent resident interaction and community living (exhibit 2). These barriers not only are physically unappealing but also contribute to the larger disconnectedness of the entire community. Current residents indicated that an ideal design plan would remove these barriers, add green space and recreational elements, and improve the infrastructure necessary to support a car-centric, rural community. The housing authority challenged teams to particularly consider innovative ways of incorporating and boosting resident engagement and to positively affect their quality of life, housing, and community.

Exhibit 2

Aerial view and site map outlining Fresno Housing's five properties in the city of Firebaugh, California

Source: Fresno Housing

The competition is designed in two phases. In phase I, a jury of five practitioners (a planner, builder, real estate finance specialist, design expert, and architect) evaluated the first-round proposals submitted electronically by 28 graduate student teams. The jury deliberated on the 10 highest scoring teams to select the four finalist teams to move on to phase II of the competition. In phase II, the four teams further refined their proposals—addressing complex issues, incorporating more detail, improving their design plans, and conducting additional analyses on the financing needed to create viable housing, following a virtual site visit to Firebaugh, California.

The virtual site visit enabled the finalists to expand on their original proposals and submit a revised final project. A student commented that "the site visit was fantastic; I liked working with a mentor and the students in the other disciplines." Another student remarked, "I really enjoyed that it was multidisciplinary; it was a fantastic experience to work with students from other programs/majors. School assignments don't require that, and I loved the experience of collaborating (again, many school design assignments are individual) and of creating a project that was greater in scope than any one of us could do. I loved the experience of working on a project that actually exists and knowing that the client's needs and the residents are real, so design considerations matter. I really appreciated how seriously the competition is handled. It did not feel like an unimportant engagement with students but a celebrated opportunity."

Several weeks after the site visit, the four finalist teams presented their proposals, on April 14, 2021, at the virtual Presentation and Awards Ceremony. At that event, the finalist teams presented revised project plans to the panel of jurors and an audience. Audience members included staff of Fresno Housing, city officials, local community members, and HUD staff and leadership. The event was streamed live for public viewing. Each student team delivered a 20-minute presentation addressing how their plans respond to the economic, social, and environmental challenges of the development site. The students then had 10 minutes to field questions from jurors. Following the presentations, the jury selected the Pratt Institute and New York University team as the winner; the University of Michigan and Harvard University team was the runner-up.

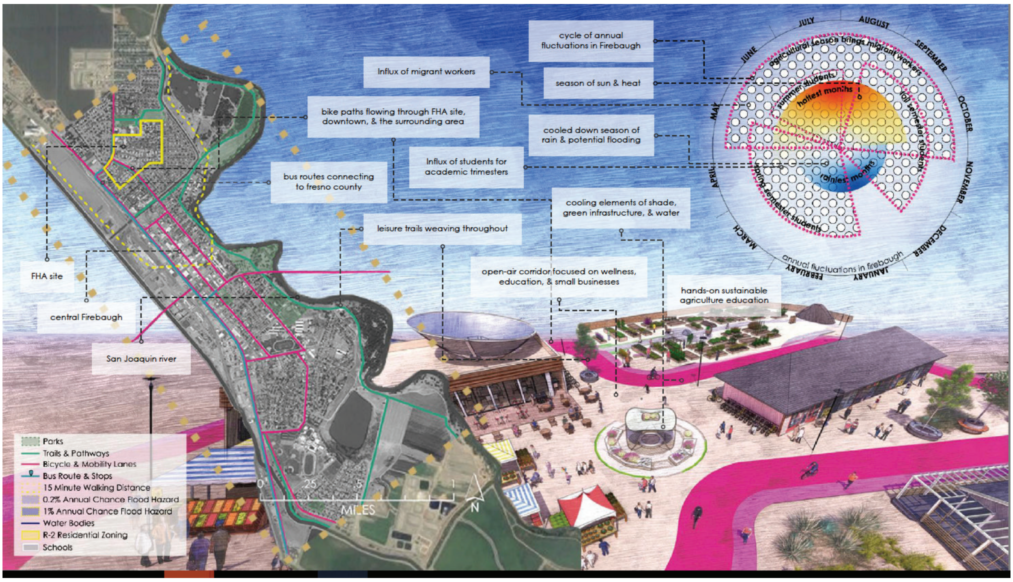
The competition jurors praised the winning team for their comprehensive financial package and their attention to innovation and environmental sustainability. All four finalist teams were addressed by Jenn Jones, chief of staff for HUD's Office of the Secretary, who noted that "the students here today have made a case for new and forward-thinking strategies that help to expand affordable housing opportunities for all families through innovative design." Jones congratulated all four finalist teams and commended the students for their hard work on behalf of Secretary Fudge. "We need your ideas, we need your creativity, and we need your energy if we are going to be able to meet the affordable housing challenges that we are seeing today. The Secretary and I are excited to see what you do next," said Jones.

The Winning Team: Pratt Institute and New York University

Sabyasachi Das, Pankti Mehta, Nella Schools, Browne Sebright, Kats Tamanaha

Exhibit 3

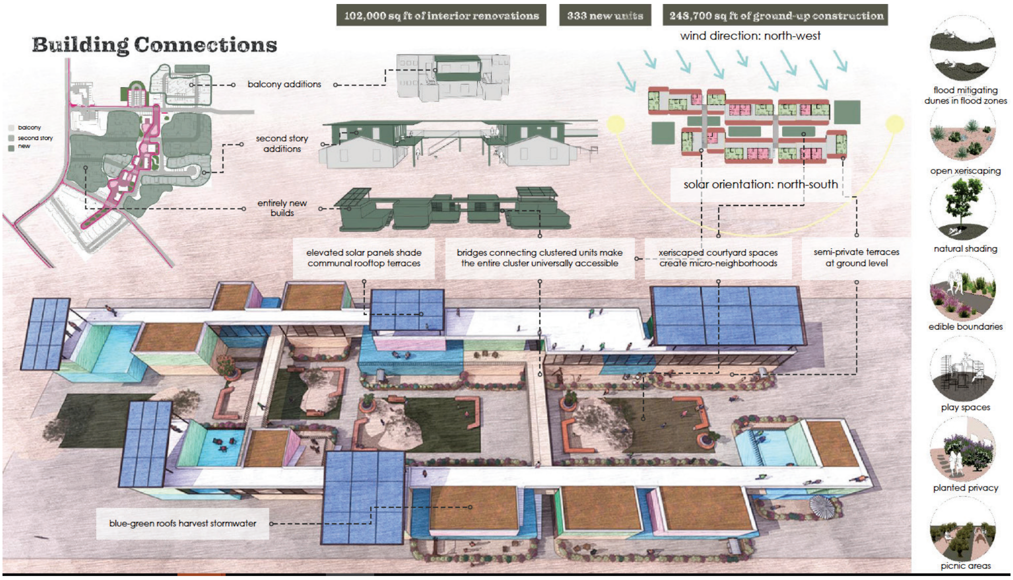
A Breathable Connected Community



The award-winning site plan from Pratt Institute and New York University, called *A Breathable Connected Community*, was inspired by the fluctuating rhythm of the city (exhibit 3). The plan would renovate 90 units and create an additional 351 new units, for a total of 441 units; 351 of those units will be affordable, at 50 percent or less than the area median income (AMI). The remaining 15 percent would be market-rate rentals. The total development cost for the project is a little over $67 million.

Exhibit 4

A Breathable Connected Community's Building and Design Features



The team's design included three scales of buildings, ranging from minor upgrades to full rebuilds, using architectural features to create a second scale of microcommunity for buildings by shifting circulation and leisure outside—encouraging interaction between residents and facilitating time outdoors. The buildings are accessible through central courtyards and open-air hallways, allowing each unit to have an allotment of semiprivate outdoor space at their front door that is spacious enough to bring furniture into and enjoy as personal terraces. By linking units together, the design ensures that each new second-floor apartment is Americans with Disabilities Act (ADA)-accessible without requiring an excessive number of elevators. The design also allows for linked installation of maintenance and support systems. As with other farming communities, Firebaugh sees a seasonal influx of migrant workers during the summer months. The team proposed creating a new type of unit: a five-bedroom communal living unit with a shared common living and kitchen space and two bathrooms. The unit is designed to help create social connections and cultivate small micro-communities for the well-being of the workers.

Exhibit 5

Neighborhood Features, Community Amenities, and Sustainable Practices

The design focuses on sustainability by creating self-sustaining energy, water, and waste systems. Whether newly constructed or with minor renovations, each of the buildings will have solar shade canopies that are designed to provide enough energy generation to sustain buildings' energy needs. Along with front porches for each unit, the buildings feature a network of landscaped courtyards and rooftop terraces with solar shade canopies. The movable, permeable shading systems capture solar energy while allowing for dappled natural light and a cool breeze to fill these communal spaces. "Blue roof" designs collect the seasonal rainfall and store it underground to be used to irrigate the landscape. The design addresses environmental disparity by diminishing air pollution sources and integrating fresh air and physical fitness access, both of which are proven to increase lung capacity and mitigate the symptoms of asthma.

In addition, the design proposes integrating circular energy and waste systems into the site while minimizing water use, with potential for future extension into the larger community. The site will be electrified, with heating and cooling provided by electric heat pumps. Daily energy needs are met through rooftop solar panels, which will provide enough energy to meet 60 percent of the needs for the entire Firebaugh site. A proposed composting hub and biogas generator will be included to sustainably recycle 100 percent of the site's organic waste by providing onsite composting and biogas generation, which can be used for cooking in local restaurants and the solar kitchen.

To enhance the connectivity of the area, the community includes courtyards and a space with equipment for programmed activities, such as chess tables, jungle gyms, picnic tables, and soft landscapes for playing games, resting, or reading a book. The landscape is xeriscaped[1] to use as little water and to keep maintenance as low as possible. Activities that take longer periods of time, such

[1] *Xeriscaping* is landscaping or gardening that reduces or eliminates the need for irrigation or uses water-conserving techniques (drought-tolerant plants, mulch, etc.).

as reading or playing chess, are shaded either with the modular systems featured throughout the buildings or with native trees and at junction points with narrow pathways. Mid-sized, drought-tolerant trees such as fig, olive, or chaste will be planted to maintain visual privacy for interior units. Courtyards are featured in the flood zone area and are designed for flood mitigation.[2]

The community's common space and courtyards will be incorporated using three zones. The first zone will be for public uses, such as a health clinic, bodega, drugstore, barbershop, coffee shop, and rentable venue space that doubles as an indoor sports court. The second zone will be a citywide attraction and is connected to the site's agricultural history, with a large community garden plaza and outdoor dining area. The third zone features a new two-story building with a solar disk and roof deck that houses an entirely solar-powered community kitchen for affordable, innovative cooking, creating a community connected to others living close by and the larger city of Firebaugh.

Finally, the plan was unique because the team decided to use the current plans for La Joya Commons established by the housing authority, thus keeping the total construction costs manageable. Head Juror, Rob Hazelton, commented that "a combination of structure reuse and rebuild creates a realistic and feasible approach to the needs of the Firebaugh community while providing interconnectivity of multiple sites and demographics." The team's design incorporates breathability and permeability. The plan creates interconnected communities on three scales: the residences, the Fresno Housing Authority site, and the city of Firebaugh as a whole. Kia Weatherspoon, one of the jurors, praised the plan, saying, "It was small language tweaks and how they build a connection. And even the use of the building on top, to me, they could have played it safe, but they still did something very, very dynamic with this accessible walkway throughout that gave you a third space outside of just the traditional gardens and community areas and vegetation. I did love that they refreshed the interiors and the unit mix."

The Runner-Up Team: University of Michigan and Harvard University

Andrew Darvin, Avanti Krovi, Christopher Prinsen, Alexander Sulek, Katherine Wheeler

The University of Michigan and Harvard University's Tachi Creciente site was selected as the runner-up. Their development plan included 414 units across five properties, offering a mixture of affordable housing for farmworkers, seniors, and families (exhibit 6). The total cost of the development would equal $98.9 million over 6.5 years. Named after the local tachi clay soil, Tachi Creciente will create an integrated, green, and service-enriched community by promoting social cohesion, health, digital inclusion, educational achievement, and workforce development. The plan incorporates innovative cross-sector partnership models, financing mechanisms, sustainable features, and design components that complement the local context.

[2] Small protective dunes are created by removing earth in the flood zone and aggregating it in mounds, diverting floodwater away from buildings.

Exhibit 6

Tachi Creciente Community Plan and Proposed Site Map

The plan will establish several community amenities, including a green corridor, the "AgTech Exposition and Education Center," new Fresno Housing Authority offices, media center, fitness center, art center, computer lab, flexible green space, a system of scattered Wi-Fi mesh networks, and more. The team placed a specific focus on digital literacy, identifying that the agricultural industry routinely uses sophisticated technologies to help them become more profitable, efficient, safe, and sustainable. The development allows for the expansion of digital inclusion and digital literacy to improve access to job pipelines in a region seeking to become the leader in agricultural technology (AgTech), and the plan aims to meet community needs for robust educational and workforce development opportunities in Firebaugh.

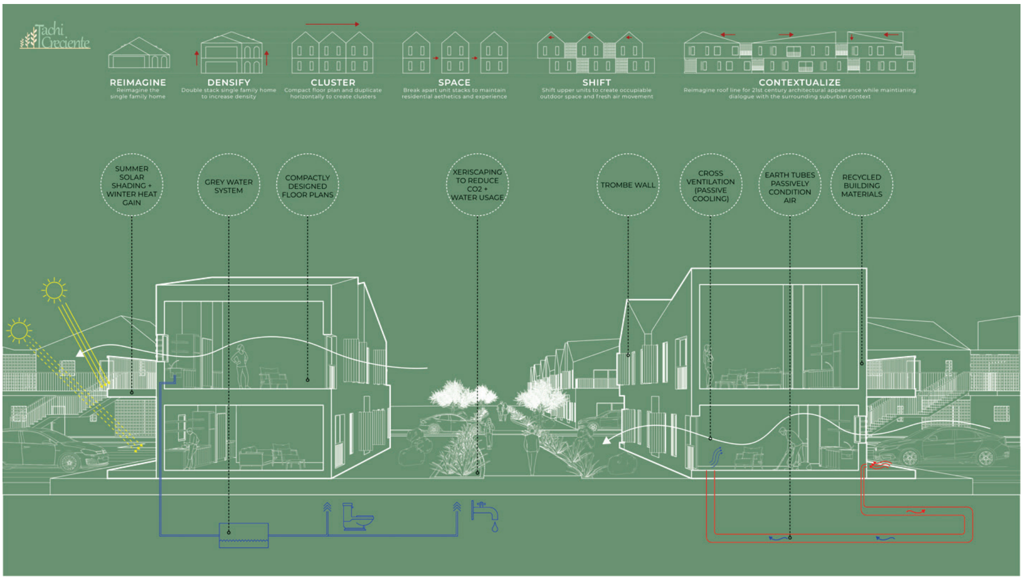
Exhibit 7

Migrant, Senior, and Multifamily Housing Unit Typologies

Tachi Creciente embraces three housing typologies: migrant, senior, and multifamily units. All units feature outdoor living spaces and are intentionally designed to rethink single-family home typology while maintaining the residential feel, at a density that adheres to Firebaugh's growth strategy (exhibit 7). All housing units will incorporate the following five architectural design features: (1) the single-family home is stacked to increase density; (2) the floor plan is compacted and duplicated horizontally to create clusters; (3) the units are spaced slightly apart to maintain residential aesthetics and experience; (4) the upper-level units are shifted to create occupiable terraces and fresh air movement; and (5) the roofline is reimagined for 21st-century architectural appearance while maintaining dialogue with the surrounding suburban context holistically. The five design features allow the development to maximize spatial efficiency, improve housing density, and, most importantly, create a better sense of place (exhibit 8).

Exhibit 8

Architecture and Design Features



Tachi Creciente emphasized providing affordable housing and building a sustainable community. The team proposed housing that is integrated with social and economic opportunities, such as a walkable and bikeable green corridor, and incorporated sustainable design practices for climate-smart communities. Those practices focused on reducing carbon emissions and resource consumption while enhancing local air quality. For example, the green corridor will use xeriscaping, a low-water landscaping method, to reduce carbon emissions. In addition, community centers are topped with solar panels to harness renewable energy. Overall energy consumption is minimized by the use of exterior circulation as a shading mechanism to block sun rays during the cooling season and allow sunlight to filter in through windows. During the heating season, temperature controls are passively managed through cross-ventilation features in earth tubes. The earth tubes take the outdoor air, filter it, and condition it underground to comfortable temperatures. Concerns around water scarcity were addressed by implementing a gray-water system that treats and reuses water from sanitary functions to be used as a toilet and garden water supply.

The team's financial plan leverages a range of financing, including rental assistance demonstration (RAD), Section 18 demolition and disposition funds, and various state and local resources. The plan estimates that the incorporation of energy-efficient community amenities will generate $5.2 million in net cash flow over 10 years for the FHA. The team proposed a cost-savings program, powered in part by solar energy and leveraging a state subsidy program incentivizing solar in multifamily affordable housing. The utility cost savings for these properties are estimated to generate an additional $1.1 million and avoid more than 3,600 metric tons in net carbon emissions. Head Juror, Rob Hazelton, noted that he "like[d] the RAD/SAC [Special Applications Center] blend" and that the team was "the only ones that understood that complex financing scheme."

Thoughts from the Jury

Rob Hazelton (Head Juror), Stephen D. Bender, Jaime Bordenave, Michael Eriksen, Karl Schoettler, and Kia Weatherspoon

The jury for the 2021 IAH Student Design and Planning Competition faced the difficult task of deciding which of the four outstanding finalist team site plans best exemplified an innovative design. The members were asked specifically to consider how well the student teams successfully and convincingly addressed the following critical elements:

- Is the proposed design reasonable and feasible in its design and planning, demonstrating knowledge and understanding of building codes and zoning?
- Is the proposed design resilient and environmentally responsive to the local climate?
- Does the proposed design demonstrate knowledge and understanding of codes and zoning?
- Is the proposed solution affordable (cost effective to construct and operate)?
- Does the design innovate in a way that integrates the design into the neighborhood and community?
- Does the design promote social responsiveness, such as creating a sense of neighborhood or cohesive community, facilitating access to employment and services, addressing accessibility, and demonstrating the opportunity for social networking, ownership, and comfort?
- Is the approach innovative in all aspects of the solution (for example, planning, design, construction, environmental concerns, and durability)?
- Does the proposal recommend innovative strategies in addressing the needs of migrant farmworkers, seniors, and families?
- Were innovative approaches employed to integrate the design into the neighborhood and community?

The jurors found that two of the four team proposals addressed nearly all the items discussed previously clearly and with forethought. Jurors narrowed down the four finalist projects, then narrowed their choice further between the Pratt Institute and New York University team and the University of Michigan and Harvard team. The jurors noted that this year's decision was both difficult and very close, but the deciding factor was that the winning team cleverly incorporated the reuse of existing structures at La Joya Commons, thereby saving on development budgeting, which set the Pratt Institute and New York University team apart as the clear winner.

Jury members identified several elements of the winning plan that not only met all the criteria but also took other innovative approaches. Rob Hazelton, Head Juror and the CEO of Dominion Due Diligence Group, noted that the winning team from the Pratt Institute and New York University "is the only team that reused La Joya Commons, which the housing authority has already invested about $1.4 million into [for] redevelopment efforts, plans, designs, and approvals. They actually reuse that plan. I appreciate that. They really thought about reuse and rebuild very purposefully. Their financial plan was also very purposeful. I believe this was the most innovative design we were presented with; it was a breathable full-blown community." The jury decided that the Pratt Institute and New York University site plan uniquely addressed the intergenerational and agricultural needs of the community and paid special attention to environmental sustainability.

Mr. Michael Duarte, Chief Real Estate Officer at Fresno Housing, also commended the students' hard work and contribution to finding innovative solutions to affordable housing challenges in the rural community of Firebaugh: "Our team was impressed with each of the final four presentations and offers our congratulations to the Pratt Institute/New York University team who innovatively incorporated feedback from residents and local experts into their final project. We look forward to reviewing the proposal in greater detail and working with the Firebaugh community to determine if this inclusive vision can be implemented."

Acknowledgments and Honorable Mentions

The U.S. Department of Housing and Urban Development (HUD) thanks the award-winning students from the Pratt Institute and New York University Team and the University of Michigan and Harvard Team for sharing their thoughts and for all the hard work they put into their submissions for this year's competition. We also thank the remaining two finalist teams who participated this year—from Columbia University and University of Michigan—Ann Arbor.

> Columbia University—*Nueva Vista's* design centered around fostering community interaction, both within and outside the neighborhood. The site plan included adding a new playground and a community center with daycare services, athletic facilities, and services for seniors. Uniquely, this team's housing unit typologies consisted of bar housing, senior housing, and fourplexes—all designed for modular construction.

> University of Michigan—*Colectivo Camino de Tule*, named after the reed native to the Central Valley of California, highlighted the area's rich natural features, its unique climate, and the community's connections to agriculture. The design incorporated a network of public spaces throughout the site to foster the development of social capital, provide important community amenities, create areas for interaction, and foster a cohesive neighborhood identity.

HUD would like to acknowledge and commend all 28 student teams who participated in the 2021 IAH Student Design and Planning Competition. Although only four teams are selected as finalists, six additional teams submitted plans were considered outstanding and ranked among the top ten proposals by the jurors. Those student teams are as follows, in chronological order by assigned team number:

> Northwestern University and Harvard University (*team:* KSMGSD)—*Canopy Commons* features a central multiuse path network that meanders through gardens and public spaces while providing opportunities for community enrichment. The proposal limits

environmental impact, preserving and rehabilitating many units while incorporating a palette of native plantings to the public space, thereby reducing irrigation infrastructure and costs.

University of California Berkeley (*team:* Gold)—*Pueblo Unido* is designed to maximize connectivity, doing so through layout, architecture, and programming conceptualized to integrate populations within the site and with the larger Firebaugh community. The plan features a central plaza featuring two community and education centers, central office space, two recreation areas, and a central promenade.

University of Southern California—*Firebaugh First* aims to recharge the land and community members and is guided by values of sustainability and resident empowerment. The proposal focuses on rejuvenating Firebaugh through affordable and dignified public housing, amenities, sustainable infrastructure, to create an active and sustainable community.

Ball State and University of California Los Angeles (*team:* A Better Tomorrow)—*Boca del Sol* is a place that invites the community to interact with their neighbors using a dramatic shift of scale between types of housing in this design to create little neighborhoods.

Stanford University—*Trellis Parkis* was designed around three core values: community resilience, practical sustainability, and scalable affordability. The community includes many strategies for increasing social benefits, such as central walkways to knit together the various sites, affordable digital access for residents, financial awareness courses, and other programs.

University of Miami and University of South Carolina (*team:* MAPSE)—*Paseo Verde* creates an environment to help families from a diversity of locations build a community by expanding access to sidewalks and walkways, limiting vehicles to a few roads and centralized parking areas. Instead of fences to separate apartments and houses, trees and plants are used to mark property boundaries and dividers between units.

HUD greatly appreciates the 2021 Innovative Affordable Housing jury members' dedication and hours devoted to the award selection process. Finally, HUD thanks Schatz Publishing Group, LLC for planning and logistics efforts under the constraints of the COVID-19 pandemic. Their hard work and flexibility made this year's competition a success.

Author

Alaina Stern is in the Affordable Housing Research and Technology Division of the U.S. Department of Housing and Urban Development.

Postscript

The competition is thoroughly documented on the Web.

To learn more about the award: https://www.huduser.gov/portal/challenge/home.html.

To read about the 2021 design guidelines: https://www.huduser.gov/portal/sites/default/files/pdf/IAH_2021_Planning_Design_Criteria.pdf.

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 chalita.d.brandly@hud.gov for consideration.

New Data Fields for HUD Aggregated USPS Administrative Data on Address Vacancies

Alexander Din
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, the U.S. Department of Housing and Urban Development, or the U.S. Government.

Abstract

Since 2005, the United States Department of Housing and Urban Development (HUD) has worked in partnership with the United States Postal Service (USPS) to receive administrative data on address vacancies. HUD has made that data available to government entities and nonprofit researchers. Since 2012, HUD has received more than 3,100 requests for access to the data. In the most recent agreement between HUD and USPS, new fields have become available regarding (1) the USPS preferred name and preferred state for a ZIP Code, (2) the count of addresses added to the USPS Address Management System (AMS) during the quarter, and (3) drop counts for entities such as mobile home communities and gated communities where mail is delivered to a single recipient but no data are collected for the addresses using that node. The purpose of acquiring those extra data was to better understand address vacancy and neighborhood change. It is expected that these new data fields will continue to be available for future datasets.

Background

The Department of Housing and Urban Development (HUD) has been acquiring administrative data on address vacancies from the United States Postal Service (USPS) since 2005. HUD makes the administrative data on address vacancies available to government entities and nonprofit researchers.[1] Since 2012, more than 3,100 requests for the data have been reviewed. Data have been provided to local and state governments, federal agencies, universities, research institutions, and nonprofit organizations.[2] Requests for the data peaked in 2019, with more than 400 requests.

The interagency agreement between HUD and USPS provides HUD with ZIP+4 data regarding a large variety of variables describing the addresses at that particular point. The 2021 Quarter 1 (2021 Q1) dataset had more than 36,000,000 records. A ZIP+4 is a very granular level of geography and can be thought of as a cul-de-sac, a block of rowhomes, or a single floor of an apartment building.[3] As letter carriers deliver mail, they also collect information regarding whether an address is a residence, business, or other and whether the address is occupied and collecting the mail. To protect potentially identifying information and in accordance with the interagency agreement, data provided to researchers are aggregated to census tracts; HUD does not provide researchers with the raw ZIP+4 data. The data are timely because data for the previous quarter are typically released within a month of that quarter ending.

The data are in demand. In addition to the several thousand requests for access to the data, a search of Google Scholar for "usps hud address vacancies" produces nearly 800 results. That many results may be modest to some but, overall, indicates that the dataset is being referenced. Determining the exact number of citations presents some difficulty because of the variance in citations. Typically, the dataset has been used for analysis of blight and vacancy but also as a component for various spatial modeling analyses.

Beginning in 2021 Q1, the following data points have become available. These data points represent several new fields each:

1. The USPS Preferred City Name and USPS Preferred State Name.

2. The number of addresses served by a drop stop, a place where the USPS letter carrier drops off mail, which is then delivered to its final destination by someone else, such as at a group quarters facility or gated community.

3. The number of addresses new to the Address Management System (AMS) over the previous quarter.

[1] The website can be accessed here: https://www.huduser.gov/portal/datasets/usps.html.

[2] Requests for data were only available dating back to 2012.

[3] For example, the author once lived in an apartment building that had not only a ZIP+4 for each floor but a ZIP+4 for each third of each floor. The building had 53 ZIP+4 designations in total, 51 for each section of each floor, one for the ground floor retail area, and one for the leasing office.

The new fields to the HUD-USPS administrative data on address vacancy were added to enable researchers to understand place names, neighborhood characteristics, neighborhood change, and vacancy.

New Fields

Preferred City and State

The Zone Improvement Plan (ZIP) Code was launched in 1963 to sort mail more efficiently (USPS OIG 2013). ZIP Codes are five-digit codes that describe where a piece of mail is to be sent. The first three characters describe the group of states and sectional center facility (SCF)—a USPS mail sorting center—where the letter is to go. From the SCF, the fourth and fifth digits of the ZIP Code further describe the area to which to send mail. ZIP Codes were designed for mail delivery and do not adhere to political boundaries. As a result, ZIP Codes frequently do not align with political or administrative boundaries. Furthermore, not all places have their own ZIP Codes; some communities do not have their own post office and are instead served by a facility in a neighboring jurisdiction. The result is that the community may not use its name on addresses but instead uses the community where the post office is located.

The use of ZIP Codes has grown to surpass delivering mail. ZIP Codes are frequently used to describe areas, to engage with populations, for marketing, and to perform spatial analyses. Considerable research has examined the errors of using ZIP Codes as units of analysis in geospatial health research (Beyer, Schultz, and Rushton, 2007; Cudnick et al., 2012; Grubesic and Matisziw, 2006; Krieger et al., 2002; Sadler, 2019). In addition to those issues, the Congressional Research Service (CRS) cited the following six common problems caused by the misalignment between ZIP Code boundaries and municipal boundaries (Ginsberg, 2011):

- Higher automobile insurance rates for drivers who live in the suburbs but are charged city rates on the basis of their ZIP Codes.
- Residents who are confused about where to vote in municipal elections because they do not distinguish between their voting and mailing addresses.
- Sales tax revenues rebated by states to the cities where they are collected often being misdirected because they are collected by merchants with ZIP Codes in different jurisdictions or by merchants who mail their products to customers knowing only their ZIP Codes.
- Individuals being sent jury duty notices when they are not eligible to serve on the basis of their residences.
- Emergency service vehicles being misdirected by confusion over what town a call has come from on the basis of mailing address information.
- Homeowners in expensive neighborhoods complaining that their housing values are diminished because their mailing addresses place them in less prestigious communities.

Due to those problems, USPS has received inquiries about whether new ZIP Codes can be created, if addresses can be added to or removed from certain ZIP Codes, and if ZIP Code names can be changed. CRS indicated that USPS believes many of those problems were due to community identity issues. Rather than issuing new ZIP Codes, which would require considerable investment and financial resources, USPS recognizes multiple names for a ZIP Code but also recommends that some names should not be used.

Beginning in 2021 Q1, data acquired by HUD from USPS will have the USPS Preferred City Name, which is not the only recognized name but the name USPS primarily recognizes. USPS also keeps records of names to avoid; however, only USPS preferred name is provided, not the other recognized names or the names to avoid.

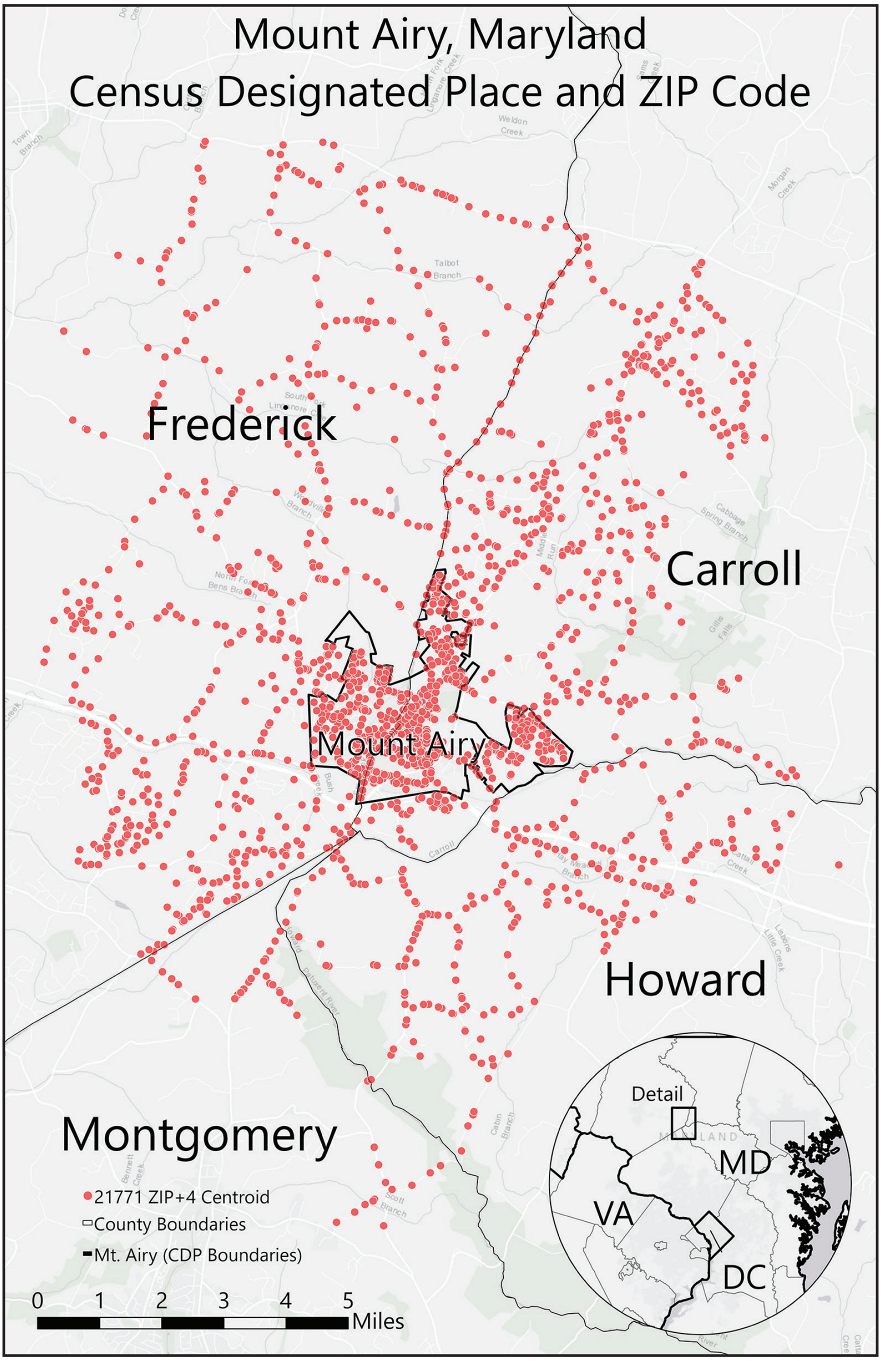
Exhibit 1 shows Mount Airy, Maryland, a small community approximately 30 miles west of Baltimore City, Maryland, and 35 miles northwest of Washington, DC, using both the Census Designated Place boundaries (Mount Airy CDP) and the ZIP+4 centroids for the 21771 ZIP Code, which has the preferred name Mount Airy[4] (Mount Airy ZIP). The Mount Airy CDP has a far smaller area, about 4.1 square miles, whereas the minimum bounding geometry[5] for the Mount Airy ZIP is nearly 20 times larger, about 96.6 square miles. By area, the Mount Airy CDP is split between Frederick County and Carroll County; approximately 34.3 percent and 65.7 percent of the land area are in each county, respectively. The Mount Airy ZIP Code expands far outside the Mount Airy CDP; however, only about 35.6 percent of its addresses are within the Mount Airy CDP. The map in exhibit 1 shows that the Mount Airy ZIP extends beyond Frederick and Carroll Counties into western Howard and far northern Montgomery counties. Exhibit 2 lists the ratios for the Mount Airy ZIP.

[4] The 21771 ZIP Code does not have any other recognized names or names to avoid.

[5] The convex hull method for the minimum bounding geometry tool was used to calculate the area of the Mount Airy ZIP Code: https://pro.arcgis.com/en/pro-app/latest/tool-reference/data-management/minimum-bounding-geometry.htm.

Exhibit 1

Mount Airy, Maryland



CDP = Census Designated Place.

Source: Compiled by author based on 2021 Quarter 1 HUD Aggregated USPS Administrative Data on Address Vacancies and Census Bureau data

Exhibit 2

Ratios for the Mount Airy, Maryland, ZIP Code

ZIP	COUNTY	USPS_ PREFERRED_ CITY	USPS_ PREFERRED_ STATE	RES_ RATIO	BUS_ RATIO	OTH_ RATIO	TOT_ RATIO	COUNTY NAME
21711	24021	MOUNT AIRY	MD	0.420422418	0.149490374	0.221428571	0.399954019	Frederick
21711	24031	MOUNT AIRY	MD	0.0114751	0.00339751	0.0	0.0108054	Montgomery
21711	24027	MOUNT AIRY	MD	0.107018127	0.0351076	0.0214286	0.101233811	Howard
21711	24013	MOUNT AIRY	MD	0.461084317	0.81200453	0.757142857	0.488006744	Carroll

Note: The county name field was added for clarity.
Source: 2021 Quarter 1 HUD-USPS ZIP Code ZIP-to-County Crosswalk File

Understanding geographic differences between USPS-defined places and CDPs is important for researchers, spatial analysts, policymakers, and others so that when conducting analysis or creating policy, they understand the area for which the analysis is being performed or for which the policy is written. The new fields describing USPS-defined places will better inform researchers and practitioners about geography.

The new data are outlined by new field descriptions in the documentation tab[6] on the web page. The documentation is as follows:

Exhibit 3

USPS_ZIP_PREF_CITY —USPS preferred city name

USPS_ZIP_PREF_STATE —USPS preferred address state

Note: ZIP Code preferred city names frequently do not align with administrative names; for more information, please see USPS City Versus Census Geography.[7]
Source: HUD-USPS ZIP Code Crosswalk Files Codebook

Drop Counts

The number of addresses served by a single drop stop were also added to the data (hereafter, addresses served by a drop stop are referred to as "drop counts" and the points are referred to as "drop stops"). They are not addresses dropped from AMS. Counts of addresses served by a drop stop are available by residential, business, or other addresses but are not broken out by vacant or no-stat and their child categories. Addresses associated with a drop stop are addresses where multiple residences are served by a single drop stop. These drop counts may include, but are not limited to, apartment buildings, care facilities, group quarters, and other facilities where multiple people live and mail is delivered to a single node. Not all nor most apartment buildings or other group facilities would necessarily be served by a drop stop.

[6] Access the web page here: https://www.huduser.gov/portal/datasets/usps_crosswalk.html#codebook.

[7] That page can be found here: https://www.census.gov/programs-surveys/geography/guidance/geo-areas/usps_census_city.html.

The USPS introduced three new fields for drop counts, which are broken down by address type, such as residential, business, or other. Data for vacant or no-stat drop count addresses are not available. Exhibit 4 shows the breakdown of the number of total addresses in each category, the number of addresses in that category served by a drop stop, and the share served by a drop stop. Nationally, slightly more than one percent and less than seven percent of residential and business addresses, respectively, are served by a drop stop; no addresses in the Other category are served by a drop stop.

Exhibit 4

Address Type	Number of Addresses	Addresses Served by Drop Stop	Addresses Served by Drop Stop (Share)
Residential	154,038,372	2,072,937	1.34%
Business	14,097,183	967,247	6.86%
Other	7,189,491	0	0.00%

Source: 2021 Quarter 1 HUD Aggregated USPS Administrative Data on Address Vacancies

Geographic Variation of Drop Counts

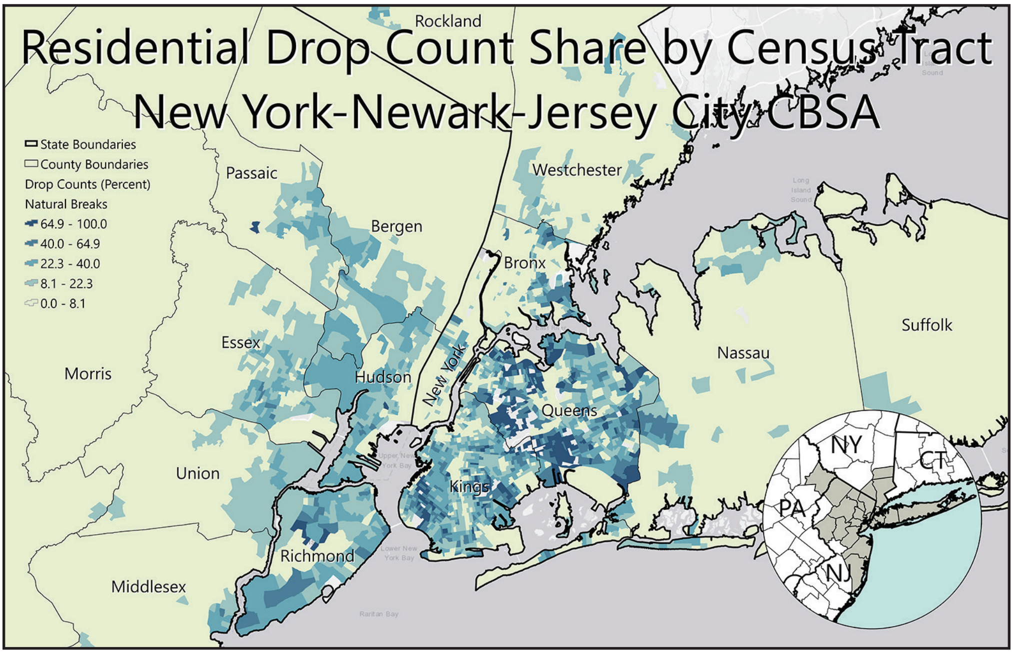
Drop counts display geographic disparities. Although 1.34 percent of residential addresses nationally are served by a drop stop, variation exists depending on the location. For example, of the 939 Core-Based Statistical Areas (CBSAs), which are made up of metropolitan and micropolitan counties, the overwhelming majority of CBSAs (834, or 88.8 percent) have less than the 1.34-percent benchmark of residential addresses served by drop stops. Of the remaining 105 CBSAs, 97 have between 1.34 percent and 10.0 percent of residential addresses served by a drop stop. Seven of the remaining eight CBSAs have 10.1 percent through 16.1 percent of addresses served by drop stops. The Athens, Ohio CBSA, a micropolitan area of roughly 65,000 people composed solely of Athens County, Ohio, had nearly one-half (47.2 percent) of addresses served by drop stops. This geographic variation implies that although drop stops are described to serve particular address types, either they are not recorded as such in AMS or this practice is not common throughout the United States.

Exhibit 5 visualizes the share of residential addresses served by a drop stop in the New York-Newark-Jersey City CBSA (NYC CBSA), the 23-county area around and including the five counties of New York City. The map focuses on the core counties of the NYC CBSA because many of the outlying counties have few to no residential addresses served by a drop stop. The majority of the census tracts served by drop stops appear to be in New York City but not in Manhattan.[8] Manhattan, or New York County—the densest county in the United States (U.S. Census Bureau, 2018)—has relatively few neighbors served by drop stops. Numerous neighborhoods throughout Staten Island, Brooklyn, and Queens use drop stops, and some, but fewer, drop stops are in the Bronx. Some neighborhoods in the suburban counties have drop stops, particularly in New Jersey in Bergen, Essex, Passaic, and Union Counties. A small number of neighborhoods in suburban New York counties, such as Nassau and Westchester Counties, are served by drop counts.

[8] Manhattan is shown as New York County on the map. Kings County and Richmond County are more commonly referred to as Brooklyn and Staten Island, respectively.

Exhibit 5

Residential Drop Count Share by Census Tract in New York-Newark-Jersey City CBSA



CBSA = core-based statistical area.
Source: 2021 Quarter 1 HUD Aggregated USPS Administrative Data on Address Vacancies

As shown in exhibit 6, the data dictionary for HUD Aggregated USPS Administrative Data on Address Vacancies has been updated for the three new fields.

Exhibit 6

New Drop Count Field Descriptions

Field	Description
DROP_ADD_R	Count of residences served at a drop site. A drop site is defined as single delivery serving multiple residences/households.
DROP_ADD_B	Count of the businesses served at a drop site. A drop site is defined as single delivery serving multiple businesses.
DROP_ADD_O	Count of the other addresses served at a drop site. A drop site is defined as single delivery serving multiple other addresses.

Source: HUD Aggregated USPS Administrative Data on Address Vacancies Data Dictionary[9]

New Addresses

The HUD Aggregated USPS Administrative Data on Address Vacancies will now include the number of addresses by type that were identified as new to AMS in that quarter. Those fields are a

[9] The Data Dictionary for HUD Aggregated USPS Administrative Data Since Quarter 4, 2020, can be found at https://www.huduser.gov/portal/datasets/usps/USPS_HUD_Address_Vacancy_Data_Dictionaries.xlsx.

count of addresses that are new to AMS, not a comparison of change. Of the 73,470 census tracts in the vacancy data, 48,294 (65.7 percent) recorded zero new residential addresses, and 9,899 census tracts (13.5 percent) recorded only one new residential address. The remaining 15,277 tracts (20.8 percent) contain the vast majority of the new residential addresses (79,468 of 89,367 new residential addresses). Exhibit 7 shows the total number of addresses and the number of addresses new to AMS by address type. Addresses new to AMS constitute a very small component of total residential or business addresses—0.06 and 0.07 percent, respectively. Exhibit 8 shows the new address count fields in the data dictionary. Anecdotally, USPS expressed that when updating the AMS, addresses are typically added after they have become active.

Exhibit 7

Addresses Identified as New to the Address Management System (AMS) 2021 Quarter 1

Address Type	Addresses	Addresses New to AMS	Addresses New to AMS (Share)
Residential	154,038,372	89,367	0.06%
Business	14,097,183	10,520	0.07%
Other	7,189,491	0	0.00%

Source: 2021 Quarter 1 HUD Aggregated USPS Administrative Data on Address Vacancies

Exhibit 8

New Count Field Descriptions

Field	Description
NEW_ADDR_R	Number of new residential addresses added to the AMS database in the previous quarter (occupied, no-stat, or vacant).
NEW_ADDR_B	Number of new business addresses added to the AMS database in the previous quarter (occupied, no-stat, or vacant).
NEW_ADDR_O	Number of new other addresses added to the AMS database in the previous quarter (occupied, no-stat, or vacant).

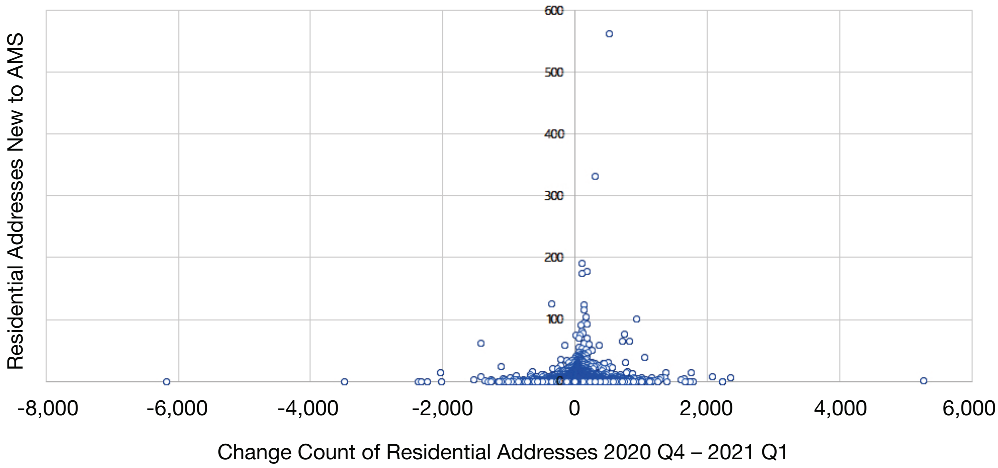
Source: HUD Aggregated USPS Administrative Data on Address Vacancies Data Dictionary

Comparing the count of total residential addresses in 2020 Quarter 4 (2020 Q4) with 2021 Q1 reveals 445,607 new residential addresses, with total residential addresses each quarter of 153,592,765 and 154,038,372, respectively. This discrepancy is just under five times the reported number of addresses new to AMS and includes tracts that have fewer residential addresses. Of the 73,470 census tracts in the dataset, 17,161 tracts (23.3 percent) had a decrease in the number of residential addresses, 23,587 tracts (32.1 percent) had no change in residential addresses, and 32,716 tracts (44.5 percent) had an increase in residential addresses.

Performing a linear regression between the calculated difference in residential addresses from 2020 Q4 to 2021 Q1 and the reported residential addresses new to AMS in 2021 Q1 reveals little information. Although the p-value is very small at 1.2533e-104, the slope is 0.0039 and the r-value is 0.08, suggesting that the relationship is quite insignificant and not meaningful. Exhibit 9 visualizes this weak relationship.

Exhibit 9

Comparison Between Count of Residential Addresses and Residential Addresses New to AMS, 2021 Q1



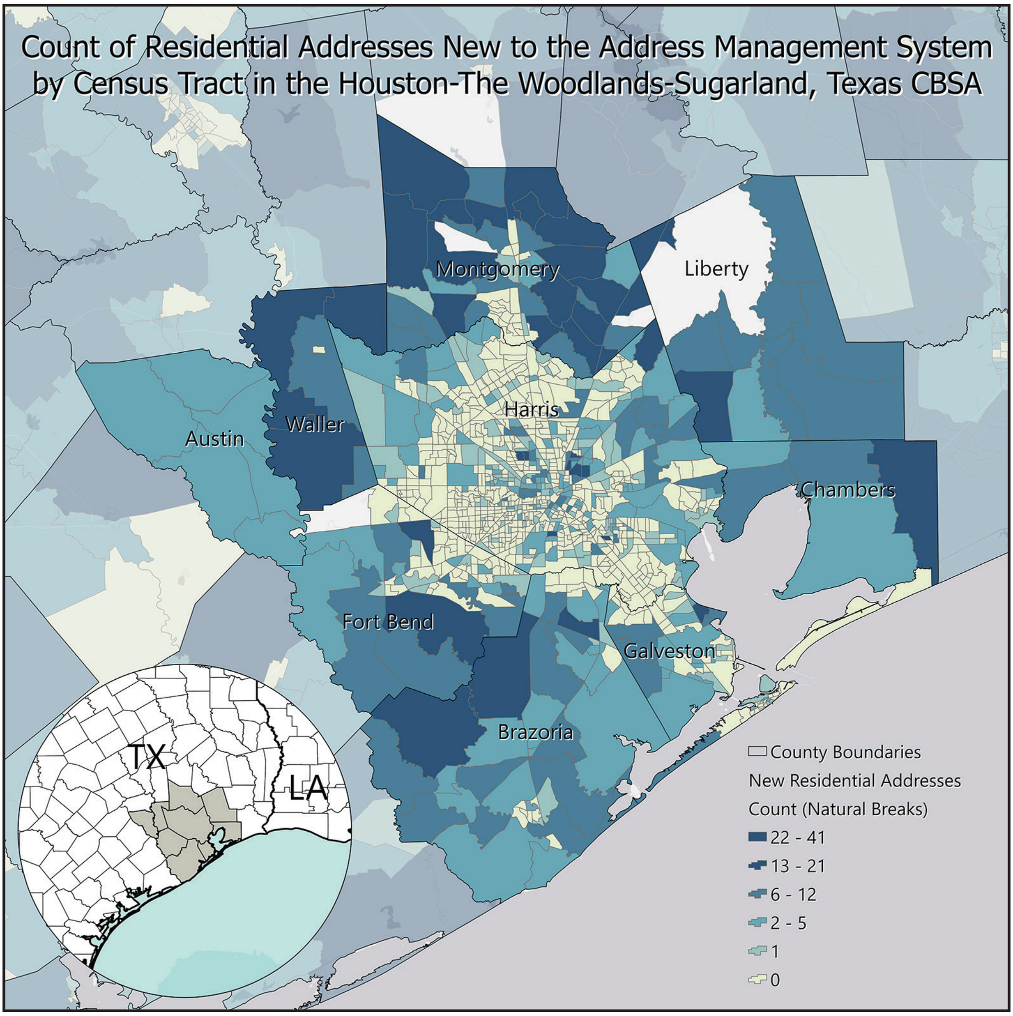
AMS = Address Management System. Q1 = quarter 1. Q4 = quarter 4.
Source: 2021 Quarter 1 and 2020 Quarter 4 HUD Aggregated USPS Administrative Data on Address Vacancies

Cartographic inspection of counts of residential addresses new to the AMS reveals that the tracts tend to be on the outskirts of metropolitan/micropolitan areas or in nonmetropolitan areas. The vast majority of residential addresses new to the AMS in 2021 Q1 (60,492 or 67.7 percent), however, are in counties described as Central by the Office of Management and Budget.[10] Of the 25,176 census tracts that had one or more or new addresses recorded, the majority are concentrated in a few Central census tracts. Nonmetropolitan and outlying census tracts tend to be much larger because the polygons must be larger to cover similar levels of population due to lower population densities in rural areas. The result is that the cartographic analysis shows city centers with few to no new addresses to AMS, whereas outlying and nonmetropolitan census tracts, which are small shares of the overall number of census tracts, appear to have many more new residential addresses. For example, exhibit 10 shows the Houston-The Woodlands-Sugar Land CBSA. The CBSA has nine counties and is centered around Harris County, where Houston is. Overall, USPS reported 2,383 new residential addresses, the largest share of which (720, or 30.2 percent) were in Harris County; however, only 27.7 percent of census tracts had any new addresses. This percentage is the lowest of any county in the Houston-The Woodlands-Sugar Land CBSA. The other eight counties had between 36.8 percent and 100.0 percent of tracts having new residential addresses, and three counties had 100.0 percent (Austin, Chambers, and Liberty counties).

[10] See the March 2020 file at https://www.census.gov/geographies/reference-files/time-series/demo/metro-micro/delineation-files.html.

Exhibit 10

Count of Residential Addresses New to the Address Management System by Census Tract in the Houston-The Woodlands-Sugar Land, Texas CBSA



CBSA = core-based statistical area.

Source: 2021 Quarter 1 HUD Aggregated USPS Administrative Data on Address Vacancies

Conclusion

It is important to revisit datasets and update as necessary while maintaining the consistency that analysts, researchers, policymakers, and others rely on. The goal of these new data fields is to provide new points of information. The ZIP Code Crosswalk Files containing the USPS Preferred Name will help researchers understand (1) where data are being aggregated to or aggregated from and (2) that places with differing names may overlap with each other depending on who is creating the names. Drop counts are intended for researchers to potentially understand the characteristics of a neighborhood. Including addresses new to the AMS is envisioned to be a convenient method to understand recent growth over the previous quarter. The new fields will likely not be the last ones added to the HUD Aggregated USPS Administrative Data on Address Vacancies as more information becomes available or future data linkages become possible.

Acknowledgments

I thank the United States Postal Service for providing these new data fields.

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References

Beyer, Kirsten, Alan Schultz, and Gerard Rushton. 2007. "Using ZIP Codes as Geocodes in Cancer Research." In *Geocoding Health Data: The Use of Geographic Codes in Cancer Prevention and Control, Research and Practice*, edited by G. Rushton, M.P. Armstrong, J. Gittler, B.R. Greene, C.E. Pavlik, M.M. West, and D.L. Zimmerman. Boca Raton, FL: CRC Press: 37–64.

Cudnik, Michael T., Jing Yao, Dana Zive, Craig Newgard, and Alan T. Murray. 2012. "Surrogate Markers of Transport Distance for Out-of-Hospital Cardiac Arrest Patients," *Prehospital Emergency Care* 16 (2): 266–272.

Ginsberg, Wendy R. 2011. *Changing Postal ZIP Code Boundaries*. Washington, DC: Congressional Research Service.

Grubesic, Tony H., and Timothy C. Matisziw. 2006. "On the Use of ZIP Codes and ZIP Code Tabulation Areas (ZCTAs) for the Spatial Analysis of Epidemiological Data," *International Journal of Health Geographics* 5 (1): 58.

Krieger, Nancy, Pamela Waterman, Jarvis T. Chen, Mah-Jabeen Soobader, S.V. Subramanian, and Rosa Carson. 2002. "Zip Code Caveat: Bias Due to Spatiotemporal Mismatches Between Zip Codes and U.S. Census-Defined Geographic Areas—The Public Health Disparities Geocoding Project," *American Journal of Public Health* 92 (7): 1100–1102.

Sadler, Richard. 2019. "Misalignment Between ZIP Codes and Municipal Boundaries: A Problem for Public Health," *Cityscape* 21 (3): 335–340.

U.S. Census Bureau. 2018. "Population Density by County: 2010." https://www.census.gov/library/visualizations/2010/geo/population-density-county-2010.html

United States Postal Service Office of Inspector General. 2013. "The Untold Story of the ZIP Code." Arlington, VA: USPS OIG. https://permanent.access.gpo.gov/gpo47009/rarc-wp-13-006.pdf.

Assessing the Effects of COVID-19 on Housing Vacancy Survey Estimates Using a Revised Nonresponse Adjustment Factor

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Abstract

Rising COVID-19 case counts in early 2020 led to changes in the data collection procedures used for the Current Population Survey/Housing Vacancy Survey (CPS/HVS), an important source of information about vacancy rates and the homeownership rate in the United States. This report examines the implications of these data collection changes for CPS/HVS estimates. The analyses draw on multiple auxiliary data sources to understand the extent to which changes in nonresponse outcomes accompanied the changes in data collection procedures. The report then develops an alternative nonresponse adjustment factor that corrects for the observed changes in nonresponse. The results suggest that changes in nonresponse likely contributed to the sharp increase in the homeownership rate estimate for the second quarter of 2020. Conversely, the vacancy rate estimates are not similarly sensitive to the alternative nonresponse weighting adjustment; however, the results illustrate the potential for the vacancy rate estimates to underestimate the actual vacancy levels due to the weighting methodology's assumption that all nonresponding housing units are occupied. These results suggest that the CPS/HVS estimates of vacancy rates and the homeownership rate should be interpreted with caution for the period affected by the changes in data collection procedures.

Introduction

In response to rising COVID-19 case counts in the United States, the U.S. Census Bureau, on March 20, 2020, suspended in-person interview attempts for the Current Population Survey, including its Housing Vacancy Survey supplement (CPS/HVS).[1] This report examines the implications of this change in data collection procedures for the CPS/HVS estimates. The quarterly CPS/HVS estimate of the rental vacancy rate is a Principal Federal Economic Indicator used by the federal government and macroeconomists to evaluate current economic conditions. Additionally, the CPS/HVS estimates include closely watched measures of the homeownership rate, homeowner vacancy rate, and gross vacancy rate that provide timely information about housing market conditions and the housing inventory.

The report first provides a brief summary of the changes made to CPS/HVS data collection procedures in response to the suspension of in-person interviews. The analyses then develop an alternative nonresponse weighting adjustment factor and examine the sensitivity of CPS/HVS estimates. The results suggest that changes in sample composition likely contributed to the historically large increase in the CPS/HVS homeownership rate estimate for the second quarter of 2020. Conversely, the CPS/HVS vacancy rate estimates are not significantly affected by the use of the alternative nonresponse adjustment factor;[2] however, the analyses illustrate the potential for the CPS/HVS vacancy rate estimates to underestimate the actual levels of vacancy in 2020 due to the weighting methodology's assumption that all nonresponding housing units are occupied.

Changes to Housing Vacancy Survey Data Collection Procedures in 2020

In response to the rising numbers of COVID-19 cases in the United States, the Census Bureau suspended personal visits for the CPS/HVS on March 20, 2020. The suspension of personal visits continued in all areas of the United States for the CPS/HVS data collection periods in April, May, and June 2020. Beginning in July, personal visits began to be reintroduced in a subset of localities, with additional areas added in August. All areas of the country were eligible for personal visits in September. During this period, the Census Bureau continued to collect the CPS/HVS by telephone, making efforts to collect telephone interviews for all sample units, including vacant units and ineligible units.

[1] The rental vacancy rate and homeowner vacancy rate are produced from the data collected by the Housing Vacancy Survey supplement, whereas the homeownership rate is produced from the occupied units in the Current Population Survey. For ease of notation, this report uses the CPS/HVS label to refer to the combined set of vacancy rate and homeownership rate estimates. Additional information about the quarterly CPS/HVS estimates is available at: https://www.census.gov/housing/hvs/index.html

[2] Use of the term statistically significant in the text of this report indicates that a finding is significant at the 90 percent level or higher. All tables report significance at the 90, 95 and 99 percent levels.

The standard CPS/HVS data collection procedures use personal visits as the primary mode of data collection but allow telephone interviews when certain conditions are met.[3] The suspension of in-person interviews meant that telephone contact attempts replaced in-person interview attempts for all housing units in the sample. These telephone contacts relied on phone numbers identified through multiple sources. For housing units with a completed interview in a previous month, interviewers attempted to contact the occupant or knowledgeable proxy interviewed during the previous month. For other housing units, interviewers were encouraged to use the available resources to identify contact information for sample housing units and/or knowledgeable proxy respondents. These resources included internal resources such as purchased third-party telephone lookup databases, as well as public records databases such as tax assessor records. Interviewers could also use online searches to identify leasing offices or telephone contacts with knowledgeable local sources such as real estate agents, neighbors, and postal workers who might identify vacant units, provide contact information for the property owner, or complete a proxy interview.

In each month, CPS/HVS data collection generally begins at the start of the week containing the 19th and closes out early the following week. On March 20, 2020, the suspension of personal visits occurred on the Friday during the week of data collection. While interviewers were able to make at least one personal visit attempt to most sample units prior to the suspension of personal visits, the suspension occurred prior to the completion of data collection activities for March 2020—and therefore prior to the completion of data collection for the first quarter 2020.

While interviewers made extensive efforts to complete data collection using telephone-based contact attempts, response rates declined following the suspension of personal visits. The share of all sampled housing units for which data collection could not be completed (i.e., Type A nonresponses using CPS/HVS terminology) increased from 14–15 percent in each quarter of 2019 to 18 percent in the first quarter of 2020, 28 percent in the second quarter of 2020, and 24 percent in the third quarter of 2020.

Data and Methodology

The base dataset for the analyses is the monthly sample of housing units selected for CPS/HVS data collection. We append the monthly datasets from January 2019 through September 2020, categorizing the data into seven quarters to match the CPS/HVS quarterly releases. In each quarter, nonresponse is defined to include any housing unit where data collection could not be completed (e.g., no response, refusal, unreachable, etc.)—termed "Type A" nonresponses in CPS/HVS terminology. The set of "completed" responses conversely includes all housing units where data collection could be completed, which includes completed interviews for occupied and vacant

[3] The CPS/HVS sample design is a rotating panel. Once selected, a housing unit is in the sample for four consecutive months, out for 8 months, and then in the sample for 4 months. Under the standard CPS/HVS data collection procedures, the first and fifth interviews are required to be collected through personal visits. In other months, a telephone interview can be completed with HVS-eligible sample housing units if the unit was HVS-eligible in the previous month, the unit is located geographically distant from the interviewer's home and other remaining interviews, and the name and telephone number of a reliable respondent is available and a telephone interview is acceptable to that person. For additional information, see the Current Population Survey Interviewing Manual (2015): https://www.census.gov/housing/hvs/methodology/CPS_Manual_April2015.pdf.

units as well as units determined to be ineligible for interview.[4] To the extent that the suspension of personal visits limited the ability of interviewers to complete data collection for sample units, the likely result would be an increase in the count of Type A nonresponses and decreases in the counts of completed cases for occupied, vacant, and ineligible units. This classification, therefore, starts with the full sample of all units selected for data collection and defines nonresponse to include units where the data collection process could not be completed.

The base dataset is supplemented with several auxiliary data sources that provide information about the characteristics of both respondents and nonrespondents.[5] First, information from the 2010 Decennial Census and property records from Black Knight, Inc. are each merged to the base sample at the housing unit level, using the Census Bureau's master address file identifier (Brummet, 2014). The 2010 Decennial Census contains information about the vacancy status, tenure, and other unit attributes at the time of the 2010 Census. The vendor data from Black Knight, Inc. contain information about the housing unit compiled from county tax assessor records and other sources. Additionally, neighborhood attributes measured at the census tract level are added from the 2018 American Community Survey 5-year estimates. Exhibit 1 contains a summary of the data sources and variables added from each source.

Exhibit 1

Supplemental Data Sources and Variable Definitions (1 of 2)

Variable	Definition
Current Population Survey & Housing Vacancy Survey Supplement	
mis1–8	Month-in-sample (MIS) group for data collection. 1 = MIS 1 … 8 = MIS 8.
metro1–3	Metropolitan status: 1 = Principal city; 2 = Metropolitan area outside principal city; 3 = Nonmetropolitan area.
2010 Decennial Census	
decmis	Sample unit cannot be matched to 2010 Decennial housing units using MAFID.
vacant1–7	Vacant unit: 1 = For rent; 2 = Rented, not occupied; 3 = For sale only; 4 = Sold, not occupied; 5 = For seasonal/recreational use; 6 = For migrant workers; 7 = Other vacant.
tenure1–4	Tenure status: 1 = owned free and clear; 2 = owned with a mortgage; 3 = rented; 4 = occupied without payment of cash rent
bld	Building type: s = single-family home; m = multifamily structure; to = mobile home or other building type
hht1–7	Household type: 1 = family, married; 2 = family, male reference person, no spouse; 3 = family, female reference person, no spouse; 4 = nonfamily, male reference person, living alone; 5 = nonfamily, male reference person, not living alone; 6 = nonfamily, female reference person, living alone; 7 = nonfamily, female reference person, not living alone.

[4] In CPS terminology, the set of completed responses includes completed interviews for occupied housing units, Type B units, and Type C units. Type B units include HVS-eligible vacant units, as well as units that are occupied solely by persons not eligible for interview. Type C units include units that are not eligible for interview such as demolished units and units converted to a nonresidential use. For additional information, see the Current Population Survey Interviewing Manual (2015): https://www.census.gov/housing/hvs/methodology/CPS_Manual_April2015.pdf.

[5] This approach is inspired by other recent nonresponse analyses that use linked data to expand the set of attributes that can be observed for both respondents and nonrespondents (Bee, Gathright, and Meyer, 2015; Brummet, 2014; Brummet et al., 2018; Eggleston and Westra 2020; Rothbaum and Bee 2020; Sabelhaus et al., 2015; Wagner and Layne, 2014).

Exhibit 1

Supplemental Data Sources and Variable Definitions (2 of 2)

Variable	Definition
2010 Decennial Census	
hhldrage	Age of the householder, continuous
Hispanic	Hispanic origin of the householder: 1 = Hispanic; 0 = Non-Hispanic
White	Race of the householder: 1 = white
Black	Race of the householder: 1 = black
AIAN	Race of the householder: 1 = American Indian or Alaska Native
Asian	Race of the householder: 1 = Asian
NHOPI	Race of the householder: 1 = Native Hawaiian or Pacific Islander
other	Race of the householder: 1 = Other race
Black Knight Inc. Records Pulled in 2018.	
bkmis	Sample unit cannot be matched to units in Black Knight data pulled in 2018.
bkowner	Black Knight's measure of owner-occupancy: 1 = owner-occupied
bkrenter	Black Knight's measure of owner-occupancy: 1 = renter-occupied
2014–18 American Community Survey 5-Year Estimates	
acsmis	Census tract of the sample unit cannot be matched to tracts in 2014–2018 American Community Survey 5-year estimates
medval	Median home value in the tract.
medinc	Median household income in the tract.
phhpov	Percent of tract households with income below the poverty-level.
pvacs	Percent of tract housing units that are vacant.
pmover	Percent of tract population age 1 and over who moved during the previous year.
pown	Percent of tract housing units that are owner-occupied.
pa17	Percent of tract population age 17 or younger.
pa18	Percent of tract population age 18–34.
pa35	Percent of tract population age 35–54.
pa55	Percent of tract population age 55–74
pa75	Percent of tract population age 75 or older
phis	Percent of tract population: Hispanic
pnhw	Percent of tract population: Non-Hispanic White
pnhb	Percent of tract population: Non-Hispanic Black
pnha	Percent of tract population: Non-Hispanic Asian
poth	Percent of tract population: Non-Hispanic other race

This set of auxiliary data sources is unlikely to exhaustively capture all of the possible changes in nonresponse patterns following the changes in data collection procedures. Instead, it should be interpreted as the set of observable factors available for this analysis. In choosing supplemental data sources for this analysis, we limited our search to data sources that could be quickly accessed and linked to the CPS/HVS sample, reflecting the desire to produce information quickly. We then sought to identify variables likely to be correlated with vacancy and homeownership while also seeking to include a broad set of demographic and housing characteristics.[6]

Spader et al. (2021) present the results of nonresponse analyses that use these data to compare the characteristics of responding versus nonresponding housing units in each quarter—and to test whether these nonresponse outcomes changed significantly following the suspension of personal visits. These analyses conclude that while the differences between nonrespondents and respondents did not change significantly across quarters in 2019, multiple significant changes appeared in the second quarter of 2020. Specifically, the nonresponse analyses suggest that the set of responding housing units in the second quarter of 2020 included fewer units that were rotating into the sample for their first or second month in the sample and more units that were in month-in-sample (MIS) 7 and 8; more units that were owned free and clear in the 2010 Decennial Census; more units identified as owner-occupied by Black Knight's measure and fewer units that could not be matched to Black Knight data;[7] and fewer units in neighborhoods with higher poverty rates.[8]

These changes over time in the relative characteristics of respondents versus nonrespondents may affect CPS/HVS estimates to the extent that they are not accounted for by the existing weighting methodology—which is described briefly in the following paragraphs and in greater detail in CPS Technical Paper 77 (U.S. Census Bureau, 2019).

Base Weights. Under the standard methodology, the base weights are the first component of the CPS/HVS weights and account for differences in sampling probabilities. As described in Technical Paper 77, the base weights are sufficient to produce unbiased estimates of vacancy rates and the homeownership rate under strong assumptions about ideal survey conditions such as zero frame error, zero nonsampling error, and nonresponse patterns that are independent of the variables used to produce the estimates (U.S. Census Bureau, 2019).

Standard NR Weights. The subsequent weighting adjustment factors applied by the standard methodology adjust for nonresponse in two ways. First, the CPS household weight applied to occupied units includes a nonresponse weighting adjustment factor that adjusts for differences in response across primary sampling units (PSUs) and central city location status.[9] This nonresponse adjustment is the first weighting adjustment factor applied to the base weights for occupied units. The HVS supplement weights applied to vacant units do not have any similar adjustment

[6] Initial analyses also merged postal data about change of address requests associated with the housing unit from the National Change of Address (NCOA) database. Surprisingly, none of the NCOA variables tested were correlated with nonresponse or selected for inclusion in the regressions so this data source is omitted from exhibit 1.

[7] The measure of nonmatches to Black Knight data should be interpreted to include a variety of factors related to both data coverage and the matching process. In particular, tax assessor data has higher coverage of single-family homes than of rental units in large multifamily buildings, so the measure of nonmatches to Black Knight data is likely correlated with renter-occupancy.

[8] More detailed results and discussion of the nonresponse analyses are available in Spader et al. (2021).

[9] The nonresponse adjustment factor groups PSUs within the same state that are similar in metropolitan status and size and then splits these clusters based on central city and non-central-city location to form the adjustment cells.

for nonresponse. In this report, we use the term 'Standard NR Weights' to refer to the weights constructed by applying this nonresponse adjustment factor to the base weights.

Second, the process of controlling the weights to independent population totals may also reduce the effects of differential nonresponse to the extent that nonresponse is correlated with the demographic subgroups used in the population controls.[10] Any adjustments for nonresponse from this second process occur in later weighting steps, so they are not reflected in the Standard NR Weights.

Alternative NR Weights. This report develops and tests an alternative nonresponse (NR) weighting adjustment factor using a propensity-score-based approach. This alternative nonresponse weighting adjustment factor is designed to replace the existing nonresponse weighting adjustment factor described previously, and we use the term "Alternative NR Weights" to refer to the weights constructed by applying the alternative nonresponse weighting adjustment factor to the base weights.

The propensity scores are constructed by estimating logistic regressions with the following form:

$$\text{(1)} \qquad \mathrm{Log}((\mathrm{Pr}(Y_i \,/\, (1 - \mathrm{Pr}(Y_i))) = \alpha + X_i\beta_1 + G_i\beta_2 + M_i\beta_3$$

Where Y_i is an indicator for whether the housing unit is a Type A nonresponse, X_i is a vector of covariates from the supplemental data sources, G_i is a set of fixed effects that interact the 51 states with three metropolitan status categories (principal city, other MSA/CBSA, and nonmetropolitan), and M_i is a set of fixed effects that interact the three metropolitan status categories with 8 month-in-sample categories. Equation 1 is estimated separately for each quarter using logistic regressions. The estimated coefficients are shown in exhibit 2.[11]

[10] A full discussion of the weighting components included in the standard methodology is available in CPS Technical Paper 77 (U.S. Census Bureau, 2019).

[11] To determine the model specification, the authors started with the set of attributes that show either a significant difference between nonrespondents versus respondents or a significant change over time in these differences. Two of the authors then independently developed specifications using logistic regressions with Akaike Information Criterion (AIC) as a measure of model performance and using ordinary least squares (OLS) with r-squared as a measure of performance. The two resulting specifications were then compared and consolidated into the final specification. While few of the estimated coefficients are significant, the AIC values and other performance metrics suggest that the covariates shown in exhibit 2 add explanatory power. Additional information about the model specification is available in the appendix of Spader et al. (2021).

Exhibit 2

Logistic Regressions Modeling Response versus Type A Nonresponse on Selected Covariates (1 of 2)

	Q1 2019		Q2 2019		Q3 2019		Q4 2019		Q1 2020		Q2 2020		Q3 2020	
	Coef.	(S.E.)	Coef.	(S.E.)	Coef.	(S.E.)	Coef.	(S.E.)	Coef.	(S.E.)	Coef.	(S.E.)	Coef.	(S.E.)
Intercept	1.894	1.592	1.965	1.552	1.588	1.570	1.833	1.661	1.823	1.418	1.490	1.286	1.228	1.287
decmis	0.129	0.370	0.179	0.335	0.229	0.325	0.154	0.351	0.169	0.299	0.140	0.274	0.116	0.251
vactype1	0.089	0.448	0.183	0.410	0.075	0.376	0.068	0.419	0.013	0.392	– 0.056	0.310	0.019	0.351
vactype2	0.339	1.677	0.601	2.042	0.313	1.979	0.344	1.983	0.804	1.801	0.057	1.098	– 0.016	1.341
vactype3	0.052	0.539	0.169	0.550	0.109	0.549	0.072	0.625	0.225	0.566	0.266	0.433	0.128	0.522
vactype4	0.286	1.384	0.569	1.332	0.311	1.450	0.557	1.514	0.533	1.170	0.279	0.935	0.320	0.918
vactype5	1.125	0.641*	1.131	0.676*	0.955	0.663	0.935	0.674	0.985	0.594*	1.003	0.500**	0.914	0.489*
tenure2	0.069	0.214	0.142	0.204	0.102	0.225	0.044	0.222	0.032	0.192	0.039	0.157	0.068	0.185
tenure3	– 0.144	0.205	-0.090	0.206	– 0.067	0.201	– 0.148	0.197	– 0.213	0.183	– 0.262	0.156*	– 0.167	0.168
tenure4	0.202	0.560	0.239	0.538	0.150	0.700	– 0.040	0.514	0.026	0.440	– 0.007	0.449	0.077	0.428
bldm	– 0.139	0.239	– 0.135	0.213	– 0.164	0.233	– 0.175	0.228	– 0.124	0.191	– 0.085	0.159	– 0.191	0.181
bldto	0.220	0.344	0.157	0.335	0.160	0.320	0.160	0.312	0.136	0.300	– 0.004	0.280	0.008	0.255
hht2	– 0.089	0.305	– 0.088	0.311	– 0.133	0.333	– 0.103	0.315	– 0.187	0.270	– 0.217	0.254	– 0.220	0.277
hht3	– 0.186	0.195	– 0.134	0.181	– 0.170	0.230	– 0.191	0.213	– 0.145	0.172	– 0.179	0.160	– 0.176	0.175
hht4	– 0.126	0.217	– 0.161	0.215	– 0.097	0.250	– 0.220	0.226	– 0.192	0.196	– 0.152	0.180	– 0.119	0.189
hht5	– 0.070	0.328	– 0.183	0.320	– 0.137	0.373	– 0.118	0.362	– 0.102	0.335	– 0.145	0.264	– 0.046	0.295
hht6	– 0.161	0.224	– 0.186	0.228	– 0.149	0.246	– 0.177	0.211	– 0.152	0.199	– 0.085	0.191	– 0.059	0.195
hht7	– 0.142	0.390	– 0.166	0.368	– 0.061	0.391	0.131	0.427	– 0.094	0.360	– 0.130	0.329	– 0.058	0.331
hhldrage	0.007	0.004*	0.008	0.004**	0.008	0.004*	0.007	0.004*	0.007	0.004*	0.008	0.003**	0.006	0.003*
Hispanic	0.015	0.278	0.008	0.308	– 0.077	0.275	– 0.089	0.265	– 0.050	0.264	– 0.068	0.226	– 0.176	0.241
Black	– 0.188	0.237	– 0.216	0.251	– 0.175	0.239	– 0.197	0.273	– 0.128	0.231	– 0.081	0.197	– 0.125	0.180
AIAN	– 0.160	0.686	– 0.186	0.687	– 0.133	0.642	– 0.121	0.649	– 0.104	0.599	– 0.166	0.523	– 0.143	0.492
Asian	0.024	0.332	0.035	0.341	– 0.134	0.348	– 0.044	0.310	– 0.023	0.337	– 0.031	0.265	– 0.066	0.299
NHOPI	– 0.220	1.250	– 0.110	1.333	– 0.230	1.220	– 0.224	1.206	– 0.230	1.245	– 0.150	1.237	– 0.118	1.115

Exhibit 2

Logistic Regressions Modeling Response versus Type A Nonresponse on Selected Covariates (2 of 2)

	Q1 2019		Q2 2019		Q3 2019		Q4 2019		Q1 2020		Q2 2020		Q3 2020	
	Coef.	**(S.E.)**	**Coef.**	**(S.E.)**	**Coef.**	**(S.E.)**	**Coef.**	**(S.E.)**	**Coef.**	**(S.E.)**	**Coef.**	**(S.E.)**	**Coef.**	**(S.E.)**
other	– 0.037	0.402	– 0.157	0.394	– 0.052	0.398	– 0.042	0.383	– 0.083	0.349	– 0.125	0.337	0.019	0.309
bkmis	0.060	0.222	– 0.027	0.242	– 0.010	0.220	0.054	0.244	0.041	0.197	– 0.022	0.182	0.001	0.181
bkowner	– 0.031	0.199	– 0.073	0.214	– 0.006	0.234	0.017	0.230	0.006	0.193	0.172	0.188	0.185	0.169
acsmis	0.222	1.556	0.178	1.540	0.264	1.591	0.155	1.595	0.034	1.536	0.069	1.371	0.176	1.312
medval	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
medinc	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
phhpov	0.755	1.017	1.092	1.167	0.506	1.062	1.047	1.148	0.751	1.081	– 0.131	1.033	0.038	1.015
pvacs	0.792	0.887	0.964	0.971	0.937	0.847	0.775	0.887	0.620	0.888	0.734	0.720	0.913	0.761
pmover	0.156	1.378	0.232	1.252	– 0.086	1.415	– 0.223	1.429	– 0.085	1.280	– 0.356	1.256	– 0.137	1.123
pown	0.128	0.532	0.258	0.583	0.134	0.603	0.092	0.581	0.177	0.535	0.162	0.558	0.121	0.447
pa17	0.227	1.516	– 0.079	1.685	0.609	1.963	0.267	1.797	– 0.096	1.827	– 0.708	1.732	– 0.500	1.521
pa18	0.160	1.717	– 0.120	1.621	0.343	1.658	0.076	1.732	0.022	1.688	0.007	1.473	0.032	1.396
pa35	– 0.232	2.168	– 0.482	2.206	– 0.025	2.204	– 0.102	2.338	– 0.340	1.978	– 0.298	1.874	0.086	1.882
pa75	1.277	2.703	0.938	2.972	1.734	2.903	0.968	2.913	1.047	3.033	0.533	2.700	1.035	2.518
phis	– 0.196	0.536	– 0.210	0.555	– 0.295	0.636	– 0.268	0.531	– 0.253	0.494	– 0.132	0.502	– 0.176	0.497
pnhb	– 0.525	0.528	– 0.476	0.468	– 0.494	0.539	– 0.618	0.486	– 0.495	0.474	– 0.363	0.445	– 0.321	0.426
pnha	– 0.297	1.009	– 0.322	1.020	– 0.287	0.953	– 0.535	1.008	– 0.235	0.968	– 0.198	0.919	– 0.125	0.923
poth	– 1.012	1.379	– 0.582	1.414	– 0.823	1.726	– 0.678	1.946	– 0.597	1.217	– 0.907	1.141	– 0.725	1.498
State x Metro FE	Yes		Yes		Yes		Yes		Yes		Yes		Yes	
MIS x Metro FE	Yes		Yes		Yes		Yes		Yes		Yes		Yes	

Q =quarter

****p<.01; **p<.05; *p<.10. Asterisks are reported for all estimates.*

Notes: This exhibit reports the results of logistic regressions that model an indicator for Type A nonresponse on the set of covariates identified in the exhibit. The dependent variable is defined so that positive coefficients correspond to increased likelihood of response (0 = Type A Nonresponse; 1 = Completed interview, Type B, or Type C). Separate logistic regressions are estimated for each quarter.

Sources: U.S. Census Bureau; Current Population Survey and Housing Vacancy Survey Supplement data for 2019–2020 linked to the supplemental data sources identified in exhibit 1

These regressions are used to calculate the predicted probability of response for each sample housing unit in each quarter, including both occupied and vacant units. The alternative nonresponse weighting adjustment factor is then calculated as the inverse of the predicted probability of response, and the alternative weights are constructed by multiplying this alternative nonresponse adjustment factor by the base weights to account for differences in response propensities.

Results

Exhibit 3 reports estimates of the homeownership rate, rental vacancy rate, homeowner vacancy rate, and gross vacancy rate using the weights described in the previous section. For ease of review, exhibits 4A–4D visualize these estimates in line charts, along with the published figures that rely on the CPS/HVS final weight (labeled "Published").

Comparison of the Alternative NR Weights estimates to the Base Weights estimates reveals the effects of the alternative nonresponse weighting adjustment, because the only difference between these estimates is the application of the nonresponse weighting adjustment to the base weights. The Alternative NR Weights estimates can similarly be compared with the Standard NR Weights estimates to examine the differences between the alternative nonresponse adjustment and the standard nonresponse adjustment. Lastly, the Published estimates provide an additional benchmark that shows the cumulative effects of the remaining weighting adjustment factors that are applied after the standard nonresponse weighting adjustment factor, such as the second-stage weighting adjustment factor that controls the weights to independent population totals.

Exhibit 3

Estimates of the Homeownership Rate, Rental Vacancy Rate, Homeowner Vacancy Rate, and Gross Vacancy Rate using Alternative Weighting Approaches

	Estimates							Year-Over-Year Change		
	Q1 2019	Q2 2019	Q3 2019	Q4 2019	Q1 2020	Q2 2020	Q3 2020	Q1 2020 – Q1 2019	Q2 2020 – Q2 2019	Q3 2020 – Q3 2019
Homeownership Rate										
Alternative NR Weights	0.655	0.652	0.657	0.661	0.661	0.673	0.672	0.006	0.021	0.015
(S.E.)	0.019	0.018	0.019	0.018	0.020	0.018	0.019	0.018	0.019	0.020
Standard NR Weights	0.661*	0.660**	0.665**	0.670**	0.673***	0.702***	0.698***	0.012	0.042***	0.033***
(S.E.)	0.020	0.018	0.019	0.019	0.020	0.017	0.019	0.018	0.019	0.020
Base Weights	0.664**	0.661**	0.667***	0.673***	0.675***	0.705***	0.699***	0.011	0.044***	0.032***
(S.E.)	0.020	0.018	0.019	0.018	0.020	0.017	0.019	0.018	0.019	0.020
Rental Vacancy Rate										
Alternative NR Weights	0.086	0.084	0.084	0.080	0.085	0.089	0.093	– 0.001	0.005	0.009
(S.E.)	0.014	0.012	0.013	0.013	0.015	0.018	0.016	0.019	0.020	0.017
Standard NR Weights	0.072***	0.070***	0.070***	0.067***	0.069***	0.060***	0.068***	– 0.004	– 0.010**	– 0.002**
(S.E.)	0.012	0.011	0.011	0.012	0.013	0.012	0.012	0.016	0.015	0.014
Base Weights	0.086	0.084	0.083	0.080	0.085	0.087	0.093	– 0.001	0.004	0.009
(S.E.)	0.015	0.013	0.013	0.014	0.016	0.017	0.015	0.019	0.019	0.017
Homeowner Vacancy Rate										
Alternative NR Weights	0.016	0.015	0.017	0.016	0.014	0.013	0.013	– 0.002	– 0.002	– 0.004
(S.E.)	0.004	0.004	0.004	0.004	0.004	0.004	0.004	0.006	0.005	0.005
Standard NR Weights	0.013***	0.013***	0.014***	0.014***	0.011***	0.008***	0.009***	– 0.002	– 0.004	– 0.005
(S.E.)	0.003	0.003	0.003	0.004	0.003	0.003	0.003	0.004	0.004	0.004
Base Weights	0.016	0.015	0.017	0.016	0.014	0.013	0.013	– 0.002	– 0.003	– 0.004
(S.E.)	0.004	0.004	0.004	0.004	0.004	0.004	0.004	0.005	0.005	0.005
Gross Vacancy Rate										
Alternative NR Weights	0.139	0.140	0.140	0.132	0.136	0.139	0.134	– 0.003	– 0.001	– 0.007
(S.E.)	0.013	0.014	0.013	0.014	0.014	0.016	0.014	0.012	0.012	0.011
Standard NR Weights	0.120***	0.121***	0.121***	0.115***	0.113***	0.098***	0.100***	– 0.007**	– 0.023***	– 0.021***
(S.E.)	0.012	0.013	0.012	0.013	0.013	0.013	0.012	0.010	0.010	0.009
Base Weights	0.142	0.143*	0.142	0.134	0.139	0.139	0.135	– 0.003	– 0.004	– 0.007
(S.E.)	0.014	0.015	0.014	0.014	0.016	0.017	0.015	0.012	0.013	0.011

*NR = nonresponse. Q= quarter. SE = standard error.**

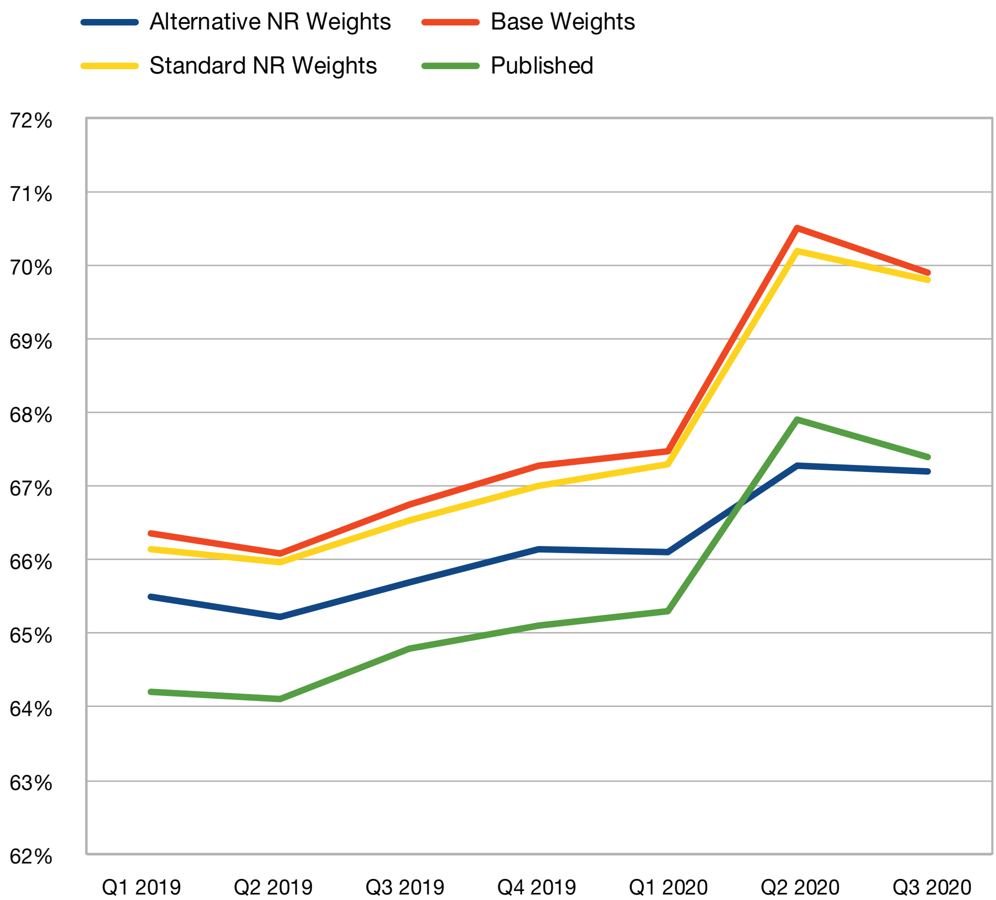
***p<.01; **p<.05; *p<.10. The asterisks reflect significance tests that compare the estimates using the Base Weights and the Standard NR Weights, respectively, to the estimates using the Alternative NR Weights for the same outcome and quarter.*

Notes: This exhibit reports estimates of each outcome using the propensity-score-based nonresponse adjustment developed in this report (Alternative NR Weights), the CPS base weights (Base Weights), and the CPS base weights multiplied by the existing nonresponse adjustment factor (Standard NR Weights).

Sources: U.S. Census Bureau; Current Population Survey and Housing Vacancy Survey Supplement data for 2019–2020 linked to the supplemental data sources identified in exhibit 1

Exhibit 4A

Homeownership Rate Estimates by Quarter and Weighting Approach



NR = nonresponse. Q = quarter.

Note: This exhibit visualizes the estimates reported in exhibit 3, along with the published Current Population Survey/Housing Vacancy Survey estimates using the final weights.

Sources: U.S. Census Bureau; Current Population Survey and Housing Vacancy Survey Supplement data for 2019–2020 linked to the supplemental data sources identified in exhibit 1

Exhibit 4B

Rental Vacancy Rate Estimates by Quarter and Weighting Approach

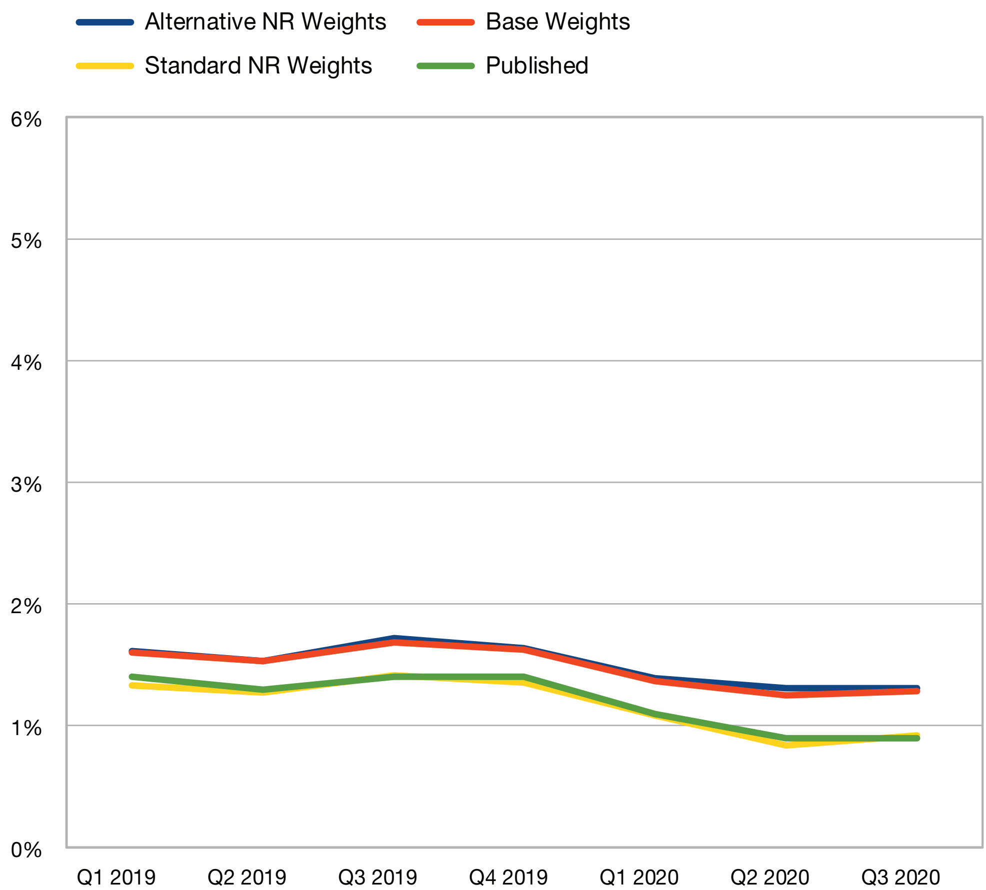
NR = nonresponse. Q = quarter.

Note: This exhibit visualizes the estimates reported in exhibit 3, along with the published Current Population Survey/Housing Vacancy Survey (CPS/HVS) estimates using the final weights.

Sources: U.S. Census Bureau; Current Population Survey and Housing Vacancy Survey Supplement data for 2019–2020 linked to the supplemental data sources identified in exhibit 1

Exhibit 4C

Homeowner Vacancy Rate Estimates by Quarter and Weighting Approach



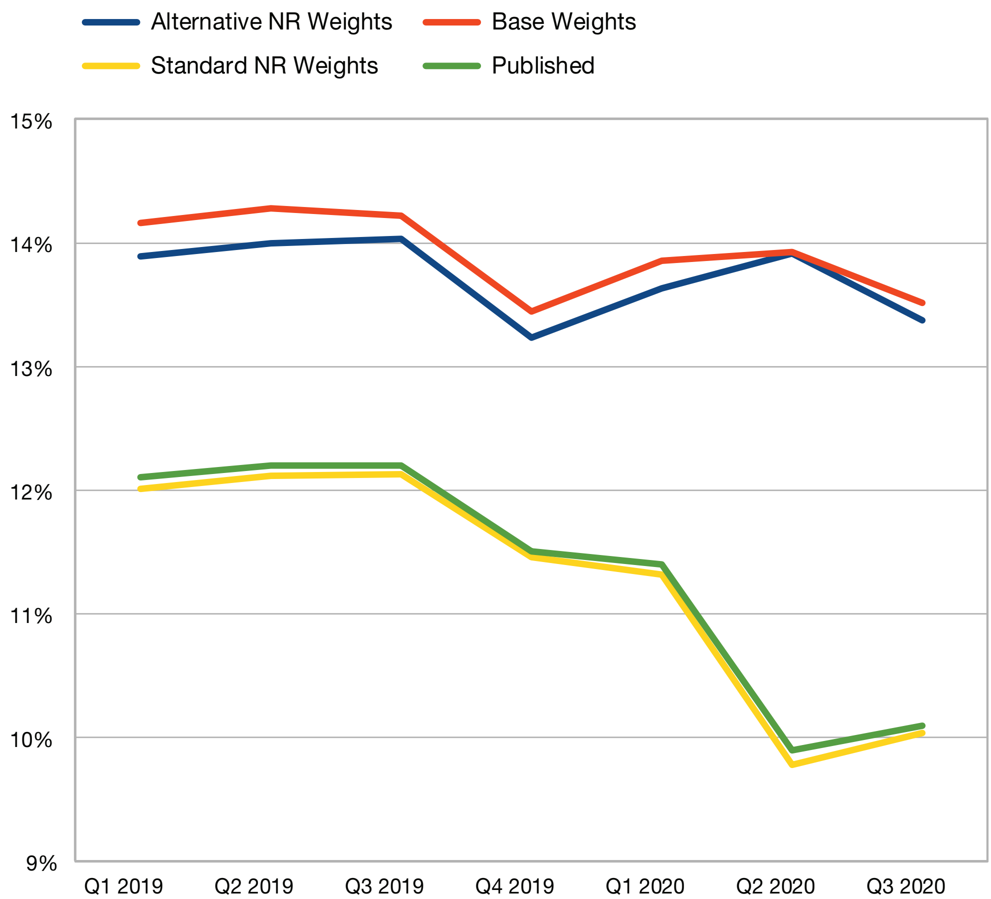
NR = nonresponse. Q = quarter.

Note: This exhibit visualizes the estimates reported in exhibit 3, along with the published Current Population Survey/Housing Vacancy Survey (CPS/HVS) estimates using the final weights.

Sources: U.S. Census Bureau; Current Population Survey and Housing Vacancy Survey Supplement data for 2019–2020 linked to the supplemental data sources identified in exhibit 1

Exhibit 4D

Gross Vacancy Rate Estimates by Quarter and Weighting Approach



NR = nonresponse. Q = quarter.

Note: This exhibit visualizes the estimates reported in exhibit 3, along with the published Current Population Survey/Housing Vacancy Survey (CPS/HVS) estimates using the final weights.

Sources: U.S. Census Bureau; Current Population Survey and Housing Vacancy Survey Supplement data for 2019–2020 linked to the supplemental data sources identified in exhibit 1

Comparison of the homeownership rate estimates in exhibit 3 suggests that correcting for the observed sample composition changes using the alternative nonresponse adjustment factor significantly reduces the size of the homeownership rate increases estimated for the second and third quarters of 2020. The year-over-year increase in the Alternative NR Weights estimate of the homeownership rate is 2.0 percentage points in the second quarter of 2020, which is significantly smaller than the 4.4 percentage-point increase in the Base Weights estimates. Similarly, the year-over-year increase in the Alternative NR Weights estimate for the third quarter of 2020 is 1.5 percentage points, which is significantly smaller than the 3.2 percentage-point increase in the Base Weights estimates. Comparing the Alternative NR Weights estimates to the Standard NR Weights estimates, the year-over-year increases in the Alternative NR Weights estimates for the second and third quarters of 2020 are also significantly smaller than the increases in the Standard NR Weights estimates, suggesting that the Alternative NR Weights estimates correct for sample composition changes that are not addressed by the existing nonresponse adjustment.

These results suggest that the homeownership rate increases in the second and third quarters of 2020 are influenced by the observed changes in sample composition in addition to changes in the true homeownership rate; however, there are important caveats. First, the alternative nonresponse weighting adjustment factor applied to the Alternative NR Weights estimates adjusts only for differences in observed attributes. There may be important additional changes in sample composition that are unobserved. Second, drawing inferences about the implications of these results for the published estimates based on the CPS/HVS final weight must also consider the additional adjustment factors and population controls applied to the published estimates.

Exhibit 3 presents similar estimates for the rental vacancy rate, homeowner vacancy rate, and gross vacancy rate. In contrast to the results for the homeownership rates, the Alternative NR Weights estimates for the vacancy rates closely track the Base Weights estimates in all quarters. The differences between the Alternative NR Weights estimates and the Base Weights estimates are less than 0.1 percentage points in all quarters for the rental vacancy rate and the homeowner vacancy rate and less than 0.3 percentage points in all quarters for the gross vacancy rate. Moreover, none of the Alternative NR Weights estimates of any vacancy rate are statistically different from the Base Weights estimates. One possible explanation for these results is that the observed changes in nonresponse captured by the regressions in exhibit 3 are not strongly correlated with vacancy—and therefore that adjusting for these changes does not substantially alter the vacancy rate estimates. However, an important caveat is that the covariates included in the logistic regressions may omit important attributes relevant to correcting for the impact of changing nonresponse patterns on vacancy.

An additional finding from exhibit 3 is that the Base Weights and Standard NR Weights estimates of the vacancy rates diverged in 2020 after moving roughly in tandem throughout 2019. For example, the difference between the Base Weights and Standard NR Weights estimates of the rental vacancy rate was either 1.3 or 1.4 percentage points in each quarter of 2019 before increasing to 2.7 percentage points by the second quarter of 2020. Because the only difference between the Base Weights and Standard NR Weights estimates is the choice of weights, these outcomes are due to changes over time in the effects of the nonresponse adjustment factor applied to occupied units in the current methodology. Specifically, the differences reflect the current methodology's assumption that all vacant units will be identified during in-person data collection attempts, so all Type A nonresponses are occupied units.

The current CPS/HVS weighting methodology calculates the nonresponse weighting adjustment using the pooled set of completed interviews and Type A nonresponses, excluding vacant units. Therefore, the resulting nonresponse weighting adjustment weights the occupied interviews up to the total of completed interviews plus Type A nonresponses, but does not include a similar adjustment for vacant units. This adjusted total of occupied units is then combined with the unadjusted total of vacant responses when the population control totals are applied to weight the units up to the total number of housing units in the United States. This sequence of steps relies on the assumption that all vacant units will be identified during the in-person data collection attempts. The result is that any vacant unit that cannot be identified and is instead coded as a Type A nonresponse will increase the CPS/HVS estimate of occupied units and decrease the estimate of vacant units.

Under normal conditions, interviewers make multiple in-person data collection attempts with the goal of identifying as many vacant units as possible and minimizing the effect of this assumption on CPS/HVS estimates. Additionally, comparisons of the CPS/HVS estimates across quarters are made under the assumption that the effects of any remaining misclassifications are approximately constant across quarters, allowing for valid comparisons over time. The suspension of in-person data collection attempts in early 2020 has the potential to violate these assumptions, increasing the risks that vacant units might be missed and altering the data collection procedures used in different quarters. The consequence is that the Standard NR Weights and Published estimates of each vacancy rate will underestimate the true vacancy rate to the extent that vacant units were missed. The divergence between the Standard NR Weights and Base Weights estimates in exhibit 3 illustrates the extent to which these issues affected the CPS/HVS vacancy rate estimates for the second and third quarters of 2020 and must be considered when interpreting the estimates for that period.

Conclusion

The onset of the COVID-19 pandemic in early 2020 led to changes in the data collection procedures used for the HVS,, an important source of information about vacancy rates and the homeownership rate in the United States. This report describes the changes in data collection procedures and examines their implications for CPS/HVS estimates in 2020. The results illustrate the potential for the changes in data collection procedures to affect the CPS/HVS estimates of vacancy rates and the homeownership rate during this period. The results for the homeownership rate suggest that observed changes in sample composition likely contributed to the homeownership rate's increase in the second quarter of 2020. While the vacancy rate estimates are not found to be similarly sensitive to the observed changes in sample composition, the results suggest that the CPS/HVS vacancy rates likely underestimate the actual levels of vacancy in 2020 due to the weighting methodology's assumption that all nonresponding housing units are occupied. The conclusion is that data users should apply caution when interpreting CPS/HVS estimates for the period when in-person interviews were suspended.

Acknowledgments

The authors would like to thank Jonathan Rothbaum for providing valuable guidance and feedback at multiple stages of this project.

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References

Bee, C.A., G.M.R. Gathright, and B.D. Meyer. 2015. Bias from Unit Non-Response in the Measurement of Income in Household Surveys. Unpublished paper, August 2015. Chicago, IL: University of Chicago.

Brummet, Q. 2014. Comparison of Survey, Federal, and Commercial Address Data Quality. Working paper 2014-06. CARRA. Suitland, MD: U.S. Census Bureau.

Brummet, Q., D. Flanagan-Doyle, J. Mitchell, J. Voorheis, L. Erhard, and B. McBride. 2018. "What Can Administrative Tax Information Tell Us About Income Measurement in Household Surveys? Evidence from the Consumer Expenditure Surveys," *Statistical Journal of the IAOS* 34 (4): 513–520.

Eggleston, J., and A. Westra. 2020. Incorporating Administrative Data in Survey Weights for the Survey of Income and Program Participation. Working paper 2020-07. SEHSD. Suitland, MD: U.S. Census Bureau.

Rothbaum, J., and C.A. Bee. 2020. Coronavirus Infects Surveys, Too: Non-response Bias During the Pandemic in the CPS ASEC. Working paper 2020-10. SEHSD. Suitland, MD: U.S. Census Bureau.

Sabelhaus, J., D. Johnson, S. Ash, D. Swanson, T. Garner, J. Greenlees, and S. Henderson. 2015. "Is the Consumer Expenditure Survey Representative by Income?" In *Improving the Measurement of Consumer Expenditures*, edited by Christopher D. Carroll, Thomas F. Crossley, and John Sabelhaus. Chicago, IL: University of Chicago Press.

Spader, Jonathan, Daniel Truver, Peter Mateyka, Patricia Holley, and Robert Callis. 2021. Is Homeownership Actually Rising and Vacancy Falling? Understanding Housing Vacancy Survey Estimates for 2020. Working paper 2021-04. SEHSD. Suitland, MD: U.S. Census Bureau.

U.S. Census Bureau. 2019. Current Population Survey Design and Methodology Technical Paper 77.

Wagner, D., and M. Layne. 2014. The Person Identification Validation System (PVS): Applying the Center for Administrative Records Research and Applications' (CARRA) Record Linkage Software. Working paper 2014-01. CARRA. Suitland, MD: U.S. Census Bureau.

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 alexander.m.din@hud.gov.

Recreation Counties and Available Housing in Rural Oregon

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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, the U.S. Department of Housing and Urban Development, or the U.S. Government.

Abstract

The term "recreation county" designates counties that meet certain metrics indicative of regions of high levels of tourism. In rural Oregon, there are seven recreation counties. This article reviews the qualities used to designate these counties as recreation counties, then compares metrics in non-metropolitan recreation counties versus other non-recreation non-metropolitan counties to analyze the relationship between recreation characteristics and long-term rental housing shortages. The impact on housing is particularly prevalent in the Northwest Coastal region of Oregon.

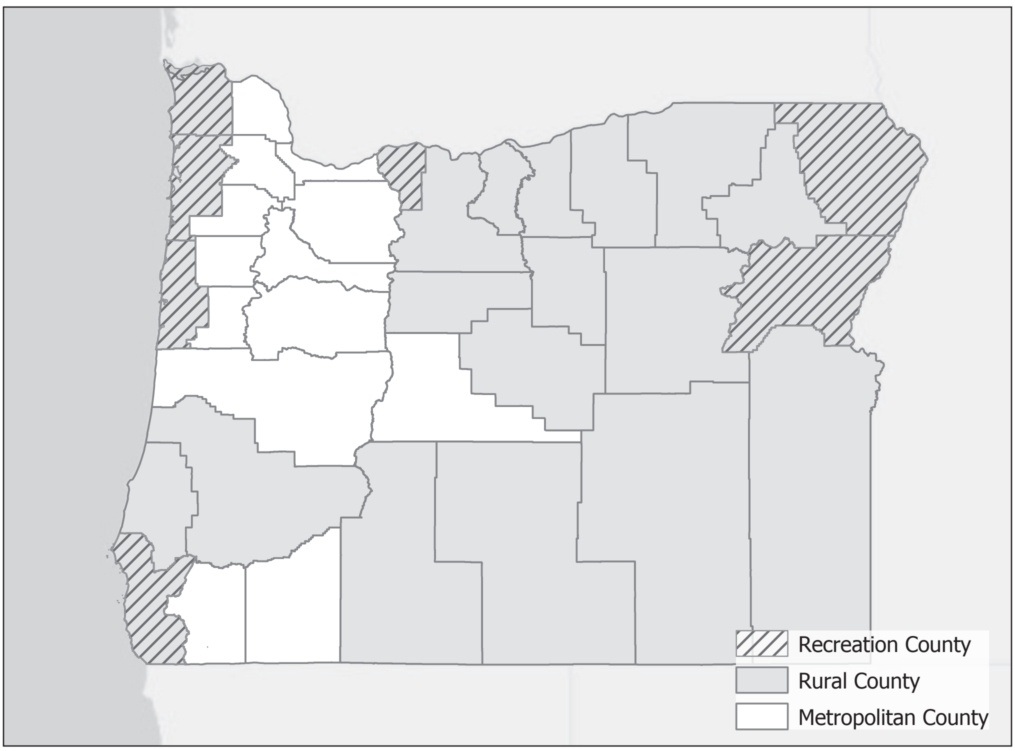
In counties throughout the United States, recreation and tourism play a role in influencing available housing. "Recreation county" is a term used to classify counties that possess certain criteria. The U.S. Department of Agriculture (USDA) designates a recreation county by analyzing employment rates, total tourism-based earnings, and the percentage of vacant housing units intended for seasonal or occasional use as reported in the 2010 Census of Population (USDA

Economic Research Service [ERS], 2015; Reeder and Brown, 2005).[1] In the United States, there are 333 total recreation counties, 229 of which are in rural areas. Oregon contains eight recreation counties, and seven are in rural Oregon (see exhibit 1). These rural recreation counties in Oregon are Baker, Clatsop, Curry, Hood River, Lincoln, Tillamook, and Wallowa counties.

In the 2010 Census, non-metropolitan areas in America comprised 46.2 million people, or 15 percent of the population.[2] Rural areas exhibit lower socioeconomic indicators than their urban counterparts. Over the past six decades, national poverty rates have remained consistently higher in rural areas than in urban areas (USDA ERS, 2021). In 2019, the poverty rate for rural areas was 15.4 percent, whereas the poverty rate for urban areas was 11.9 percent. This difference was influenced by various factors, including access to education, because education attainment in urban areas is higher than in rural areas (USDA ERS, 2021). These issues are compounded in rural areas, which create an environment in which residents do not experience the same socioeconomic indicators as in urban areas.

Exhibit 1

Recreation Counties in Oregon by Urban/Rural Designation



Source: Office of Management and Budget definition of metropolitan statistical area (MSA) to define urban and non-metropolitan (rural)

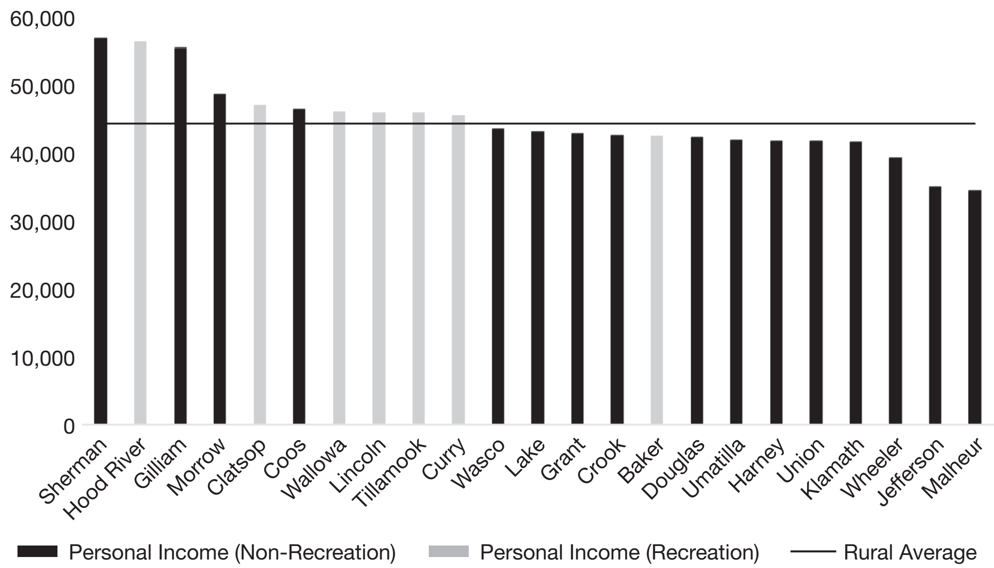
[1] Throughout this article, the use of "seasonal, recreational, and occasional homes" will be used interchangeably with the term "vacation homes."

[2] This article uses the Office of Management and Budget's definition of Metropolitan Statistical Area (MSA) to define urban and non-metropolitan (rural).

Paralleling national patterns of urban and rural areas, rural Oregonians experience higher poverty rates than their urban counterparts. In analyzing U.S. Department of Commerce Bureau of Economic Analysis (BEA) data, the average personal income in rural Oregon is $44,155 per year, whereas the average personal income in urban Oregon is $51,145 per year (BEA, 2020).[3] Exhibit 2 compares the personal incomes from recreation counties with the rest of rural Oregon. Six of the seven recreation counties have a higher personal income than the average of rural Oregon, supporting extensive research that the tourism industry is a driving component of the economy of a region (Li, Jin, and Shi, 2018).

Exhibit 2

Personal Income in Rural Oregon by Recreation and Non-Recreation Counties, 2019



Source: Bureau of Economic Analysis, 2019

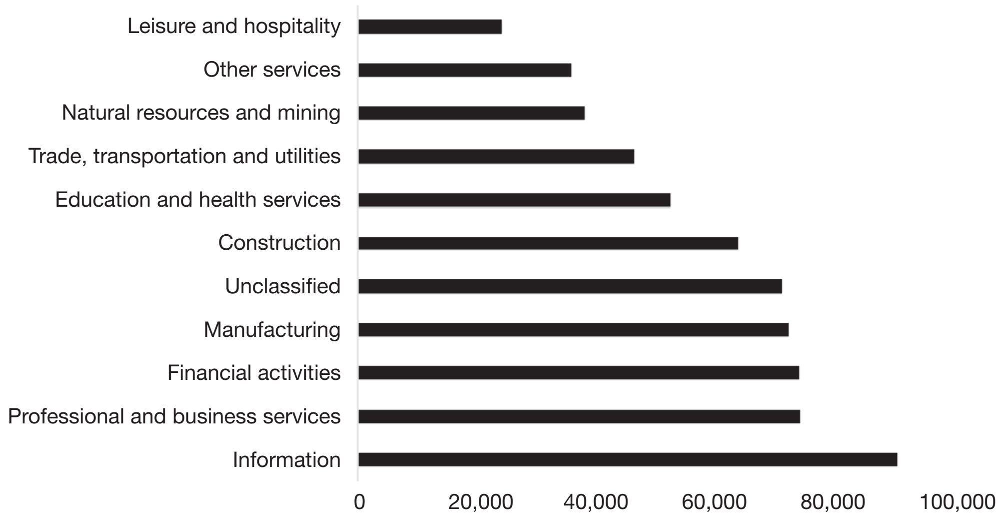
A unique component that distinguishes a recreation county from other counties is the high number of jobs that exist in the sectors of "entertainment, recreation, accommodations, eating and drinking places, and real estate, which are industries that provide lower wage jobs for employees in these sectors" (U.S. Bureau of Labor Statistics, 2021). In Oregon, the average wages for the leisure and hospitality sector are lower than any other private industry in the state (exhibit 3). This is reflected in the number of rent-burdened households in recreation counties. Exhibit 4 demonstrates the burden on housing costs that renters in recreation counties experience. The U.S. Department of Housing and Urban Development (HUD) defines "rent-burdened" as households that spend more than 30 percent of their income on housing (HUD, 2011). In rural Oregon, the average percentage of income that households spend on rent is 37.5 percent, which establishes the average rural renter in Oregon as rent-burdened. Recreation counties exhibit the highest incidence of rent burden, with

[3] Personal income is defined as "Income that people get from wages, proprietors' income, dividends, interest, rents, and government benefits. A person's income is counted in the county … where they live, even if they work elsewhere" (U.S. Bureau of Labor Statistics, 2020).

five of the seven counties above the rural Oregon average. Additionally, median rents are higher in counties with more vacation homes, with Hood River, Clatsop, Lincoln, Curry, and Tillamook counties exhibiting higher rents than any other rural county (exhibit 5).

Exhibit 3

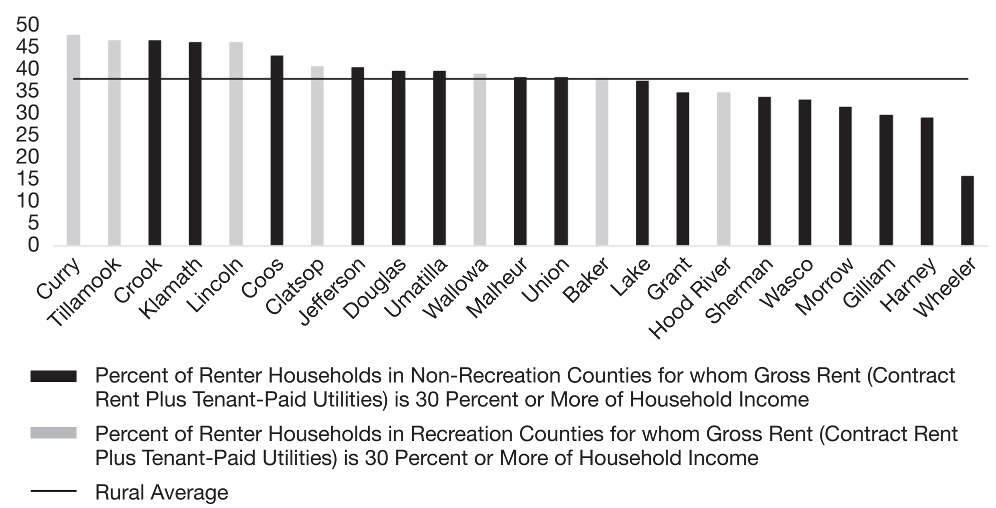
Annual Average Wages by Supersector Industry in Oregon, 2019



Source: State of Oregon Employment Department, 2019

Exhibit 4

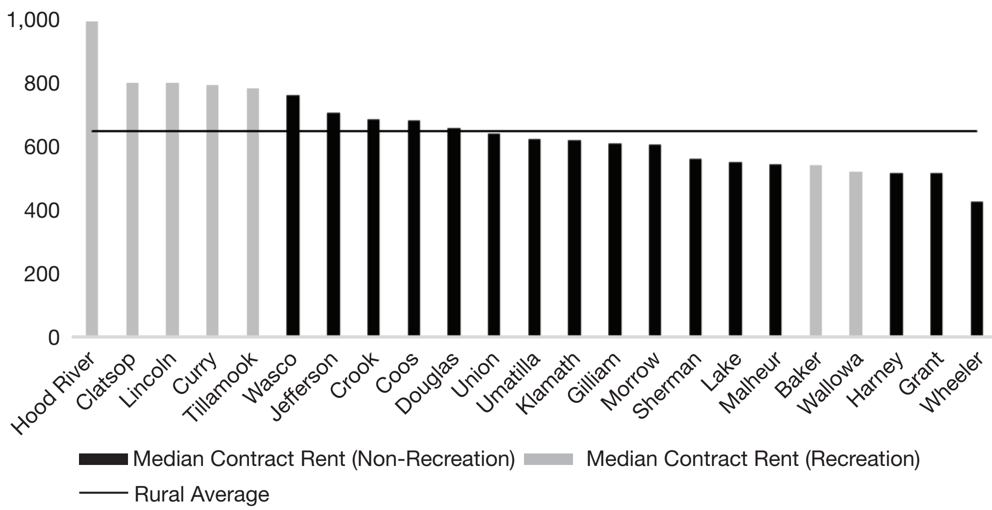
Housing Cost Burden in Rural Oregon by Recreation and Non-Recreation Counties, 2019



Source: U.S. Census Bureau, 2019 American Community Survey

Exhibit 5

Median Rents in Rural Oregon by Recreation and Non-Recreation Counties, 2019

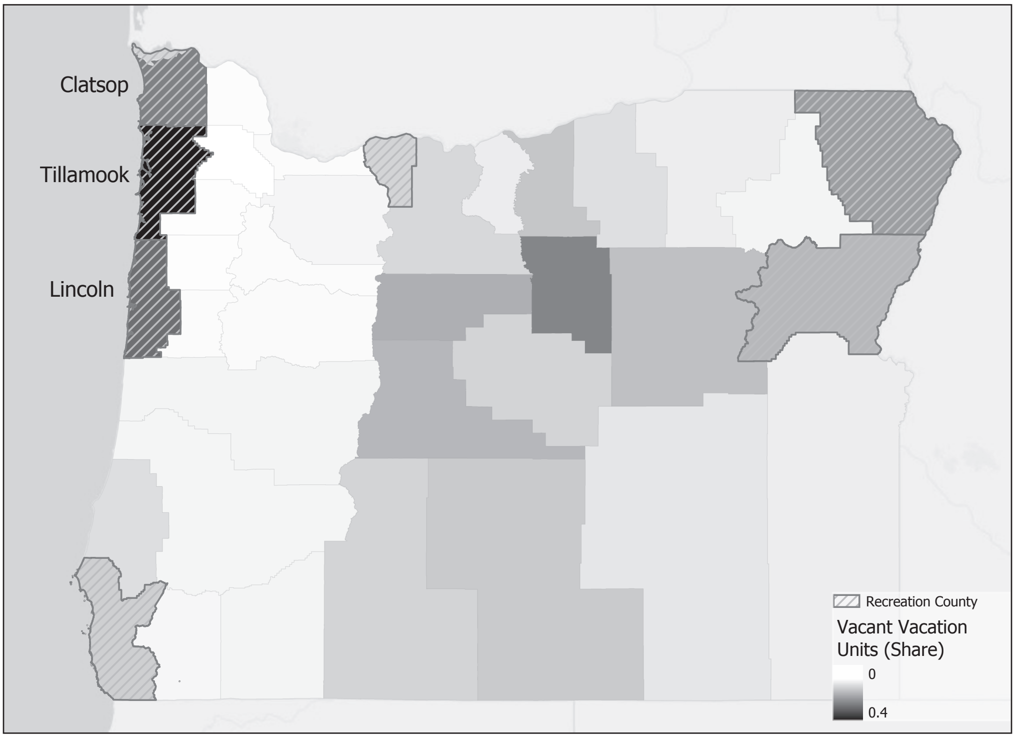


Source: U.S. Census Bureau, 2019 American Community Survey

Another qualifying metric that designates a recreation county is having a high "percentage of vacant housing units intended for seasonal or occasional use reported in the 2010 Census of Population" (USDA ERS, 2015). Exhibit 6 illustrates the counties with the highest vacancy of units intended for seasonal, recreational, or occasional use, normalized by the total number of housing units. Specifically, Clatsop, Tillamook, and Lincoln Counties have the highest vacancy rates in Oregon as a percentage of their total housing stock. In analyzing these three counties more closely, removing the total number of vacant seasonal, recreational, or occasional homes from the total number of vacant homes reveals that seasonal, recreational, or occasional homes play a significant role in the number of available housing units (see exhibit 7).

Exhibit 6

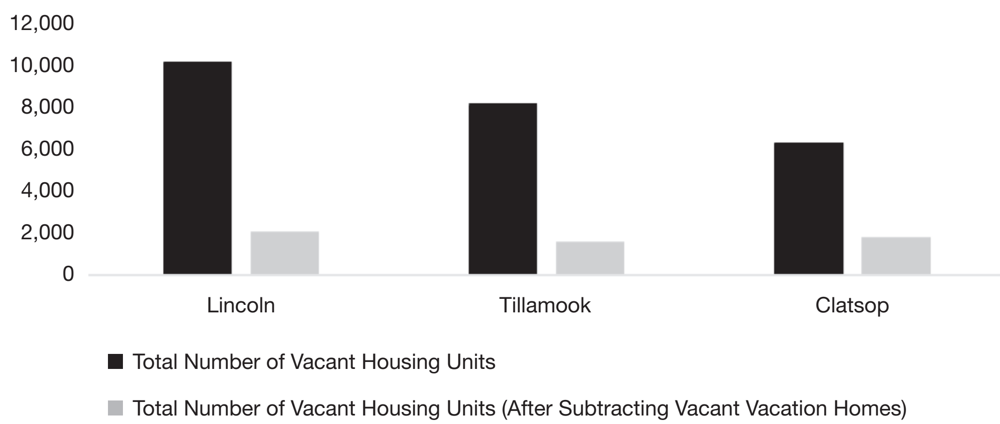
Percentage of Total Housing Units that are Vacation Homes, Oregon, 2019



Source: U.S. Census Bureau, 2019 American Community Survey

Exhibit 7

Impact of Vacation Homes on Housing Availability in Counties with Highest Number of Vacation Homes in Oregon



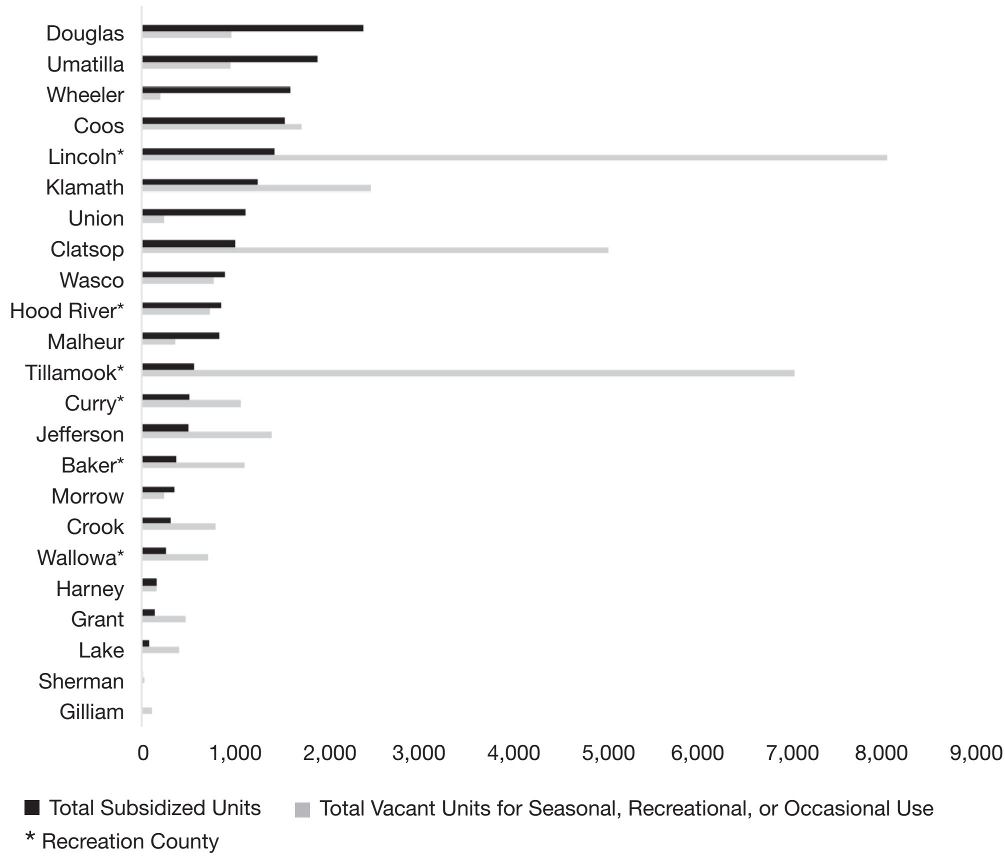
Source: U.S. Census Bureau, 2019 American Community Survey

Tillamook County experiences the highest percentage of total housing units that are vacation homes in Oregon (exhibit 6). Because of this, Tillamook County can be examined as a case study to further understand the connection between vacation homes and housing shortages. A housing study created for Tillamook County establishes two zones in the county—a strong coastal market in which more expensive homes are purchased mainly with cash, and a weaker, interior market in which less expensive homes are often purchased with the assistance of conventional or subsidized loans (czb, 2017). The more expensive, seasonal homes on the coast support a tourism industry that creates low-paying jobs. In turn, this leads to a more challenging housing market in the interior regions of the county where low-wage workers can afford housing. The more affordable interior market is saturated to the point that 56 percent of low-wage workers who work in Tillamook County live outside the county. Of the low-wage workers who live in Tillamook County, 55 percent work outside the county. This mismatch is partly due to housing availability and the cost of housing (czb, 2017). The housing study establishes that the large number of vacation homes on the coastal market are a leading cause for the housing shortage, creating stress on the more affordable interior market. Although this housing study focuses on Tillamook County, the other recreation counties in Oregon experience similar patterns as Tillamook County, such as having a large number of vacation homes compounded with low wages of people who work there. This suggests that the housing landscape that Tillamook County is experiencing, including that of lower-income individuals traveling farther to find available and affordable housing, is one that could reasonably mirror the housing market of Oregon's other recreation counties.

Recreation counties contain fewer available housing units and large numbers of renters who are rent-burdened. When considering the impact on renters in recreation counties, it is important to consider the availability of affordable housing units. Exhibit 8 displays an aggregate of HUD, Low Income Housing Tax Credit, and USDA subsidized units per county. Recreation counties are marked with an asterisk. Recreation counties experience a clear disparity between vacation homes and total subsidized housing units because there are many times more vacation homes than there are affordable units in recreation counties. As the number of vacation homes contributes to the housing shortage and creates substantial impacts on the community, it is important that the number of affordable housing units corresponds to the needs for housing.

Exhibit 8

Total Number of Subsidized Units Compared with Total Number of Vacant Units for Seasonal, Recreational, or Occasional Use in Rural Oregon Counties



Sources: U.S. Census Bureau, 2019; Housing and Urban Development, 2021; Aggregate of Low Income Housing Tax Credit and USDA asset layers on ArcGIS Pro

Renters in rural recreation counties experience unique challenges compared with their non-recreation county neighbors. They are more rent-burdened than other non-recreation rural county residents, partly because the same industry that the recreation counties rely on creates lower-paying jobs for its citizens. Renters in recreation counties encounter fewer available units, which may be because of the prevalence of seasonal, recreational, and occasional use homes, as well as low numbers of subsidized units. A greater investment in housing is needed, particularly in recreation communities that have a higher concentration of vacation homes, such as Tillamook, Clatsop, and Lincoln Counties. In recreation counties, policymakers should consider innovative solutions to housing and take into account the unique indicators that recreation counties possess.

Acknowledgments

I would like to acknowledge my team at the Portland Field Office for their review of this article and Alexander Din for supporting me in the development of this concept.

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References

czb (2017). *Creating a Healthy Housing Market for Tillamook County: Findings and Recommendations for the Tillamook County Housing Task For the County of Tillamook, OR*. https://docs.czb.org/TillamookMarch2017Spreads-Final.pdf

Li, Kevin X., Mengjie Jin, and Wenming Shi. 2018. "Tourism as an Important Impetus to Promoting Economic Growth: Critical Review," *Tourism Management Perspectives* 26: 135–142. https://doi.org/10.1016/j.tmp.2017.10.002

Office of Management and Budget. 2010. "Standards for Delineating Metropolitan and Micropolitan Statistical Areas," *Federal Register* 75 (123), June 28, 2010.

Reeder, Richard, and Dennis Brown. 2005. *Recreation, Tourism, and Rural Well-Being*. U.S. Department of Agriculture Economic Research Service. https://www.ers.usda.gov/webdocs/publications/46126/15112_err7_1_.pdf?v=5710.9

State of Oregon Employment Department. 2019. "Employment and Wages by Industry." https://www.qualityinfo.org/ed-ewind/?at=1&t1=0~4101000000~50~1~0000~00~00000~2019~00

U.S. Bureau of Labor Statistics. "Leisure and Hospitality." 2021. https://www.bls.gov/iag/tgs/iag70.htm

———, Bureau of Economic Analysis (BEA). 2020. "Income and Saving." https://www.bea.gov/resources/learning-center/what-to-know-income-saving

U.S. Census Bureau; American Community Survey. 2019. https://data.census.gov/cedsci/

U.S. Department of Commerce, Bureau of Economic Analysis (BEA). 2020. "Personal Income by County, Metro, and Other Areas." https://www.bea.gov/data/income-saving/personal-income-county-metro-and-other-areas

U.S. Department of Agriculture Economic Research Service (USDA ERS). 2021. "Rural Poverty & Well-Being." https://www.ers.usda.gov/topics/rural-economy-population/rural-poverty-well-being/

———. 2015. "Descriptions and Maps." https://www.ers.usda.gov/data-products/county-typology-codes/descriptions-and-maps/#recreation

U.S. Department of Housing and Urban Development. 2021. "Assisted Housing, National and Local." https://www.huduser.gov/portal/datasets/assthsg.html

———. 2011. "Glossary of Terms to Affordable Housing." https://archives.hud.gov/local/nv/goodstories/2006-04-06glos.cfm

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.

Acceptance of Private Flood Insurance for Federal Housing Administration-Insured Mortgages

Maria Chelo Manlagnit De Venecia
U.S. Department of Housing and Urban Development

The views expressed in this article are those of the authors and do not represent the official positions or policies of the Office of Policy Development and Research, the U.S. Department of Housing and Urban Development, or the U.S. Government.

Summary of Proposed Rule

On November 23, 2020, the Federal Housing Administration (FHA) proposed a rule that would allow a private flood insurance option instead of insurance through the National Flood Insurance Program (NFIP),[1] when FHA requires flood insurance.[2] The Flood Disaster Protection Act of 1973

[1] NFIP, which is being administered by the Federal Emergency Management Agency (FEMA), is a federally operated program that aims to reduce the adverse economic impact of flooding on private and public structures by offering flood insurance to properties with significant flood risk; and encouraging communities to adopt and enforce floodplain management regulations.

[2] Note that this impact analysis was based on the proposed rule published in the Federal Register last November 23, 2020 (https://www.federalregister.gov/documents/2020/11/23/2020-25105/acceptance-of-private-flood-insurance-for-fha-insured-mortgages).
Currently, a final rule is being drafted to address the public comments received when it was published in the Federal Register. As such, it is possible that there could be changes in the final rule and impact analysis.

(FDPA) requires the owner of a property mapped in a special flood hazard area (SFHA)[3] and located in a community participating in the NFIP to purchase flood insurance as a condition of receiving a federally backed mortgage. Current regulations of the FHA do not permit private flood insurance as an option to satisfy the mandatory purchase requirement under the FDPA; instead, FHA requires owners to obtain and maintain NFIP flood insurance during such a time as the mortgage is insured, to the extent that NFIP insurance is available. The proposed rule will amend the FHA regulations to allow mortgagors the option to purchase private flood insurance on properties located in SFHAs, in satisfaction of the mandatory purchase requirement for FHA-insured mortgages. This amendment also reflects the intent of the Biggert-Waters Insurance Reform Act of 2012 (Biggert-Waters Act) to encourage private-sector participation in the provision of flood insurance.[4]

Acceptance of private flood insurance would benefit borrowers, particularly those who are in low-income communities but located in higher flood risk areas, who want FHA-insured mortgages by providing them consumer choice, including the opportunity to obtain private flood insurance policies that may be more affordable than NFIP policies. Overall, the proposed rule would reduce the regulatory restrictions on flood insurance for FHA-insured loans that include preventing lenders' refusal to accept flood insurance on FHA-insured mortgages and reducing housing costs to homebuyers associated with delay in home sale closings if there is a lapse in NFIP's authorization.

There would be approximately 900 to 1,500 flood insurance policies on FHA-insured mortgages in SFHAs that would adopt private flood insurance. The change in homeowners' flood insurance provider from NFIP to a private insurance company would result in a transfer of flood risk from the federal government through NFIP coverage of homes with FHA-insured mortgages to the private insurance sector. Associated with this transfer of risk would be a transfer of insurance premium revenues from NFIP to the private insurance market, which is estimated to be between \$1.3 million and \$2.2 million. There is a compliance cost related to the acceptance of private flood insurance by FHA-insured mortgages in SFHAs, including costs associated with modifying existing FHA policies and procedures and training employees to review private flood insurance policies.[5] These activities would add to administrative workload and incur some cost; however, such costs are expected to be small and insignificant.

Background

The National Flood Insurance Program

For almost 50 years, NFIP has been the primary source of flood insurance coverage for residential properties in the United States. The low supply of flood insurance by private insurers was one of

[3] SFHAs, also referred to as 100-year floodplains, are areas within a flood plain having a 1 percent or greater chance of flood occurrence in any given year (44 CFR 59.1) and are delineated on maps issued by FEMA for individual communities (44 CFR part 65).

[4] Reforms on the Biggert-Waters Act were designed to improve the financial integrity and stability of the NFIP, and to increase the role of private markets in the management of flood insurance risk.

[5] To help mortgagees evaluate whether a flood insurance policy meets the definition of "private flood insurance," HUD is proposing to provide a compliance aid. This compliance aid will also address concerns that a mortgagee, especially small mortgagees who lack technical expertise regarding flood insurance policies, could have difficulty evaluating whether a flood insurance policy meets the definition of "private flood insurance."

the reasons that Congress created the NFIP in 1968. However, private flood insurance was offered by the private sector between 1895 and 1927. The losses incurred from the 1927 Mississippi River floods and additional flood losses in 1928 led most insurers to stop offering flood policies (National Research Council, 2015a). At that time, private insurers contended that flood risk was uninsurable due to the catastrophic nature of flooding, the magnitude of damage, the difficulty of determining actuarially fair insurance rates, and the concern that private insurance companies could not profitably provide flood coverage at a price that consumers could afford (GAO, 2014; Horn and Webel, 2018).

As of November 2018, Federal Emergency Management Agency (FEMA) data show that the NFIP has over 5.1 million flood insurance policies nationwide in 22,315 communities,[6] providing over $1.3 trillion in coverage and collecting about $3.6 billion in annual premium revenue. Among the 5.1 million NFIP policies, 95 percent are residential policies, and the rest is commercial policies. The distribution of NFIP policies varies across the country. September 2018 data show that about 35 percent of all policies in force are in Florida, 15 percent are in Texas, and 10 percent are in Louisiana. California comes in fourth (4.5 percent), followed by New Jersey (4.4 percent) and South Carolina (4 percent). These top six states account for approximately 72 percent of all the policies in the program.

The NFIP flood premiums are set based on flood zones,[7] depicted on Flood Insurance Rate Maps (FIRMs).[8] The insurance rates vary within each zone due to certain aspects of the property and across all zones to reflect different types of properties—for example, single-family residential versus commercial.[9] Within SFHAs, premiums vary significantly by zone and elevation. For example, in 2016, for all policies in the "A" zones, the average premium was $1,432, whereas, in the "V" zones, the average was $4,759. Data on NFIP policies by flood zone comparing 2015 and 2018 show that residential policies are almost evenly divided between areas inside and outside the SFHA. Policies for single-family homes decreased to 73 percent in 2018 from almost 90 percent in 2015. In contrast, policies for other family homes have increased from 5 percent to 22 percent. However, Kousky et al. (2018) noted that although it is evident that NFIP policies are concentrated in hurricane-prone coastal communities—e.g., Florida, Texas, and Louisiana accounting for almost 60 percent of all contracts nationwide—many of these contracts are outside the area mapped as at

[6] Communities voluntarily participate in NFIP to have access to federal flood insurance and in return are required to adopt minimum floodplain standards. Homeowners in communities that do not participate in NFIP or have been suspended or sanctioned cannot purchase NFIP flood insurance. Horn and Webel (2021) noted that homeowners in these nonparticipating or suspended communities face challenges receiving federal disaster assistance in flood hazard areas, and have difficulties receiving federally backed mortgages.

[7] SFHAs are labeled as Zones A (A1-30), AE, AH, AO, V, VE, VO, and V1-30. "A Zones" refer to inland floodplains and coastal floodplains subject to waves of less than 3 feet, whereas "V Zones" refer to narrow strips on the coast subject to breaking waves of at least 3 feet. Other designations for classifying zones in the SFHA are Zone AR and Zone A99. Outside SFHA, zones include B, C, and X for moderate-to-low risk and D for undetermined risk. See https://www.fema.gov/flood-zones for details.

[8] Across the country, FIRMs vary in age and are updated on a prioritized basis.

[9] The NFIP rates by zone are determined by the following factors: (1) SFHA—type of property, number of floors, basement presence, elevation relative to base flood elevation (BFE), year of construction, presence or absence of obstructions, and replacement cost ratio; and (2) outside SFHA—type of property, basement type, and loss history. For details, see https://www.fema.gov/faq/calculation-flood-insurance.

risk of high storm surge (A Zone). Only about 1 percent of policies are for homes inside the area mapped as at risk of high storm surge (V Zone).

Federal Housing Administration-Insured Mortgages[10]

Preliminary data from The U.S. Department of Housing and Urban Development (HUD) and FEMA,[11] which are limited to locations or by flood zones of the housing units with FHA-insured loans only—i.e., inside SFHAs or outside SFHAs—show that, on average, 3 percent of housing units with FHA-insured mortgages are in SFHAs. Within SFHAs, approximately 99.6 percent of all housing units with FHA-insured mortgages are located in "A" Zones, whereas the remaining 0.4 percent of the housing units are in "V" Zones. Among the states, Louisiana has the highest share of housing units in SFHAs, at 17 percent, followed by Florida (13 percent), Mississippi (7 percent), and West Virginia (5 percent).

Estimating the number of properties affected by the proposed rule

The proposed rule would affect all FHA-insured borrowers buying homes located in SFHAs and who must comply with the requirement to purchase flood insurance. The maximum number of affected borrowers is estimated by assuming that every homeowner with an FHA-insured mortgage located in SFHA would otherwise maintain flood insurance from NFIP.[12] Previous studies of the flood insurance market enable us to determine how the market for private flood insurance may respond to FHA's regulatory relaxation.

Kousky et al. (2018) estimated that the current private flood insurance in the United States accounts for 3.5 to 4.5 percent of primary residential flood insurance policies. Using this information and available data on FHA and NFIP premiums in 2016, we estimated that the adoption rate of private flood insurance for FHA-insured mortgages would be between 3 to 5 percent in the first few years and could increase in the future.[13] This is a conservative estimate of the number of flood insurance policies on FHA-insured mortgages that would be covered by private flood insurance, given the likely increase in private flood insurance in the future. As a result of the proposed rule, there would be 900 to 1,500 flood insurance policies on FHA-insured mortgages in SFHAs that would adopt private flood insurance.[14]

[10] To date, there are no available data on flood insurance policies in-force for properties with FHA-insured mortgages, policy tenure, compliance to the mandatory purchase requirement after the initial approval of mortgage guarantee to homeowners with FHA-insured mortgages, or properties with FHA-insured mortgages that are receiving rates that are lower than FEMA full risk rates (pre-FIRM and grandfathered properties).

[11] Using data from HUD's database of active single-family FHA-insured mortgages and FEMA National Flood Hazard Layer, October 2018. Data include all 50 states, plus Washington, D.C., Puerto Rico, Virgin Islands, and Guam.

[12] A divergence from this assumed scenario occurs when FHA-insured borrowers let their flood-insurance policies lapse after receiving a mortgage loan.

[13] According to Kousky et al. (2018: 2), "As insurers' familiarity with flood catastrophe models grows, as underwriting experience develops, and as state regulatory structures evolve, the number of private flood policies in force could continue to grow."

[14] Merged data from HUD and FEMA showed that there were 31,000 FHA-insured mortgages located in SFHA in 2016; and 3 to 5 percent of the 31,000 properties is 900–1,500 properties.

However, we do not expect that all homeowners with FHA-insured mortgages in SFHA will switch to private flood insurance. Market failure was the original justification for NFIP and could still be why significant growth is not expected in the private insurance market for now. In addition, these are some of the reasons why not all homeowners with FHA mortgages are expected to move to the private flood insurance market: *first*, the presence of NFIP's subsidized rates (pre-FIRM and grandfathered policies); *second*, the motivation to maintain NFIP's "continuous coverage" policy[15] to avoid the risk of losing discounted NFIP rates; and *third*, certain properties or locations (e.g., repetitive loss properties, severe repetitive loss properties, or high-tide flooding areas) that private insurance companies may be selective in underwriting. FEMA's new rating system, Risk Rating 2.0, which will go into effect on October 1, 2021, could also affect borrowers' decisions.[16]

Transfer from the Proposed Rule

HUD expects that the change in flood insurance carrier of homeowners with FHA-insured mortgages from NFIP to private insurance companies would result in a transfer of flood risk from the federal government through NFIP coverage of homes with FHA-insured mortgages to the private insurance sector. Associated with this transfer of risk away from the federal government would be a transfer of revenues from NFIP to the private insurance market. Using the data on the reported number of FHA-insured mortgages in SFHAs in 2016, which was 31,099, transfers of revenues from NFIP to private insurance companies if all policyholders with FHA-insured mortgages in SFHAs choose to purchase private flood insurance would be $45 million annually, accounting for 1.3 percent of NFIP's earned premium.[17] Alternatively, using the estimated 900 to 1,500 flood insurance policies on FHA-insured mortgages in SFHAs that would adopt private flood insurance, transfers of revenues from NFIP to private insurance companies would be between $1.3 million and $2.2 million, accounting for 0.04 percent to 0.1 percent of NFIP's earned premium in 2016. These estimates, which only include properties with FHA-insured mortgages with mandatory purchase requirements, could increase if properties outside the SFHAs would also be included in the estimation.

This transfer is currently estimated to be small and relatively insignificant. However, in the future, if the transfer becomes significant, it could potentially impose costs to NFIP by increasing its risk in four ways.[18] First, there is a potential increase[19] in the rates for some remaining policyholders to support and keep NFIP afloat that could possibly accelerate the move of policyholders to private insurance companies, and second, communities may rescind floodplain management standards and codes as they drop out of the NFIP (see GAO, 2017). Third, FEMA will no longer be able to

[15] Continuous coverage is required for property owners to retain any subsidies or cross-subsidies in their NFIP premium rates. A borrower may be reluctant to purchase private insurance if doing so means they would lose their subsidy should they later decide to return to NFIP coverage. See Horn and Webel (2019).

[16] See https://www.fema.gov/flood-insurance/risk-rating.

[17] Computed using available data on NFIP premiums in 2016 for policies in SFHA.

[18] Currently, there is an issue of sustainability of the program. The NFIP owes $20.525 billion to the U.S. Treasury, with only $9.9 billion left in borrowing authority from a $30.425 billion limit in law. This debt, which is conceptually owed by current and future participants in the program, is serviced by the NFIP, and interest is paid through premium revenues. See Horn and Webel (2021).

[19] HFIAA permits individual property increases of up to 18 percent but limits the rate class increases to 15 percent per year. See 42 U.S.C. §4015(e).

collect the Federal Policy Fee (FPF),[20] which is one of the funding sources of floodplain mapping and management programs. Fourth, FEMA will no longer be able to collect the Homeowner Flood Insurance Affordability Act of 2014 (HFIAA) mandated surcharge that goes into the NFIP Reserve Fund to support the financial stability of the NFIP and offset the slowdown of the elimination of current subsidized rates.[21]

Costs of the Proposed Rule

There is a compliance cost related to the acceptance of private flood insurance by FHA-insured mortgages in SFHAs that include costs associated with modifying existing FHA policies and procedures and training employees to review private flood insurance policies and evaluate whether they meet the definition of "private flood insurance" under the mandatory acceptance provisions. These activities would add to administrative workload and incur some cost, which is expected to be small and insignificant.

Benefits of the Proposed Rule

Consistency with Statutory and Industry Standards

Amending the current FHA regulations would harmonize its policies with the Biggert-Waters Act in promoting the growth of the private flood insurance market and would promote consistency with industry standards by aligning FHA standards with federal agency lenders and government-sponsored entities (GSEs)[22] for private flood insurance. In the process, this would ensure that all homebuyers with federally backed mortgages would have the same flood insurance options, which could increase consumer choice and potentially affect the affordability of flood insurance.

Increase Consumer Choice

Having the option to purchase flood insurance from NFIP and private companies increases homeowners' choice in terms of flood insurance provider, flood insurance products, and coverage that are better matched to their needs. Some of the additional options that private insurance companies could offer that are not currently available under the NFIP include living expenses while the property is being repaired, coverage of basement and other structures on a property, coverage limits greater than $250,000,[23] higher contents coverage, loss-of-use coverage, shorter waiting periods before policies take effect, and flood coverage as an add-on to a standard homeowner's policy (CIPR, 2017; Horn and Webel, 2018).

[20] FPF is part of the premium paid by all NFIP policyholders.

[21] As of April 1, 2015, every NFIP policy includes an annual surcharge required by the HFIAA. See https://www.fema.gov/media-library-data.

[22] The Federal National Mortgage Association (Fannie Mae) and the Federal Home Loan Mortgage Corporation (Freddie Mac) are collectively known as GSEs.

[23] According to the U.S. Census Bureau, the median sales price of new, single-family homes with a FHA-insured mortgage in 2018 was $249,500, whereas the average sales price was $263,500, indicating that homes are worth more than the $250,000 NFIP ceiling.

Affordability of Flood Insurance

In terms of flood insurance affordability, SFHAs are relevant because flood insurance premiums are generally higher in SFHAs, and flood insurance is mandatory for households with federally backed mortgages in these areas. A report on flood insurance affordability by FEMA (2018) shows that the combination of higher premiums and lower incomes in the SFHA creates an affordability burden on households. The report also finds that low- and middle-income households may be forgoing flood insurance, even though they are more likely to live in high-risk flood zones, and affordability is more of a problem inside SFHAs. For example, from the 5.1 million households included in the study, FEMA estimates that about 1.8 million households (35 percent) in the SFHA have flood insurance with a median household income of $77,000 per year, whereas 3.3 million households (65 percent) in the SFHA are without a flood insurance policy and have a median household income of $40,000.

Existing studies[24] that closely examined the NFIP noted that private insurers might be able to offer lower premiums for flood insurance. Kousky and Lingle (2018) showed that private flood insurance policies in Puerto Rico could compete with NFIP and offer less expensive flood policies than the NFIP because they do not include congressionally mandated surcharges and fees and inherent common construction practices (e.g., more structurally sound homes made of poured concrete, slab on grade, and with concrete roofs) that are not accounted for in NFIP rates. In addition, they were able to compete with NFIP policies by coupling flood coverage with vandalism coverage and by offering higher coverage limits. In general, with lower premiums, there could be potential savings to homeowners with private flood insurance.[25]

Private insurance companies can potentially offer lower premiums to homeowners through two methods: NFIP coarse rating and cross-subsidization. First, the NFIP has a coarse rating system[26] that is differentiated by aspects of the property, particularly by elevation relative to base flood elevation (BFE)[27]; the same rating tables are used in large zones across the country (Kousky et al., 2018). However, an empirical study by Czajkowski, Kunreuther, and Michel-Kerjan (2012) in Texas found that within zones of similar risk classification, there is significant variation in flood exposure and local conditions, and this should be reflected in the premiums. Second, there is cross-subsidization within NFIP. FEMA charges full-risk[28] for some classes of NFIP policies and lower than the full-risk rates for others. Currently, two main groups of properties pay less

[24] See CIPR (2017), Czajkowski, Kunreuther, and Michel-Kerjan (2012), Horn (2019b), Horn and Webel (2018), Kousky (2017), Kousky et al. (2018), and National Research Council (2015b).

[25] Note that quantifying the potential savings from lower premiums for some policyholders' private insurance is difficult because the amount and extent of cross-subsidization within the NFIP is currently unknown (Horn and Webel 2018).

[26] Related to this issue, the NFIP is coming out with a new risk rating, Risk Rating 2.0, which will be implemented on October 1, 2021. This development could potentially affect the choice of homeowners in purchasing their flood insurance.

[27] FEMA defines BFE as the regulatory requirement for the elevation or floodproofing of structures. Inside the SFHA, the annual premiums will increase significantly for properties below the BFE. See also Kousky (2017), Kousky, Lingle, and Shabman (2017), and Kousky and Shabman (2014).

[28] FEMA defines a full-risk premium rate as one "charged to a group of policies that results in aggregate premiums sufficient to pay anticipated losses and expenses for that group." About 80 percent of NFIP policies are currently paying full risk rates (Kousky et al., 2018).

than NFIP full-risk rates: pre-FIRM properties and grandfathered properties.[29] As of September 2018, pre-FIRM properties are estimated to be around 13 percent of NFIP policies, whereas grandfathered properties represent 9 percent of NFIP policies (Horn and Webel 2019).[30] Under the existing law, the pricing subsidy for pre-FIRM policies are being gradually eliminated out of the NFIP,[31] whereas grandfathering, which FEMA determines, is retained indefinitely.[32]

Since the NFIP does not receive any taxpayer funds to offset the price discounts for properties that pay less than NFIP full-risk rates in the program, there is cross-subsidization (Kousky, Shabman, and Lingle, 2016). The NFIP tries to recoup the actuarially low rates by charging higher rates across all other properties in the entire zone (GAO, 2014; Horn and Brown, 2018; Kousky and Shabman, 2014; National Research Council, 2015a). For example, the discounts for grandfathered properties are offset by the higher rates on other policies in the zone, i.e., there are property owners paying rates not commensurate with the risk—both those who are underpaying because they are grandfathered and those who are overpaying to offset the grandfathering (Kousky, Shabman, and Lingle, 2016).

The other cross-subsidization noted by Kousky, Lingle, and Shabman (2017) is in the "AE" Zone (AE Zone is in A Zone, and BFEs have been calculated for this zone). Currently, the premium for the coastal "AE" Zone (area subject to breaking waves of 1–3 feet) is the same as the inland "AE" Zone (not subject to the force of waves). Given that flood claims might be larger or more frequent in an area exposed to wave action, other properties in the "AE" Zones subsidize those in coastal "AE" Zones. The other group with cross-subsidization is the Community Rating System (CRS) program of the NFIP. The CRS is a voluntary NFIP program that receives discounted rates and rewards communities that take actions to lower their flood risk. As of June 2017, 1,444 communities nationwide participate in the program. Although communities in this program represent only 5 percent of all communities in the NFIP, they represent more than 69 percent of all policies in force (FEMA, 2017). Policyholders in SFHAs in communities participating in the CRS receive another 5 percent discount on premiums, up to 45 percent for certain floodplain management actions (Horn and Brown, 2018; Kousky, Lingle, and Shabman, 2017). The cross-subsidization occurs when the discount for communities in CRS ends up being offset by increased premium rates in all communities across the NFIP.

Overall, the cross-subsidization and coarse rating used by the NFIP create areas where private insurers may be able to offer premiums more closely tied to individual risks (e.g., property-

[29] These discounted rates are based on the age of the structure and not on household income or wealth. Pre-FIRM properties, through a statute, are properties that were constructed or substantially improved before FEMA had mapped the flood risk in a community. Grandfathered properties (by zone or elevation), as determined by FEMA's authority, maintain their old insurance rate class if properties are remapped into new flood rate class. There are other small groups of policies in SFHA that pay lower premiums and get charged the rate for outside SFHAs. These groups include post-FIRM properties in V zones built between 1975 and 1981, A99 properties, and AR properties. See Kousky, Lingle, and Shabman (2017) for details.

[30] Earlier studies of Horn and Brown (2018) and Kousky, Lingle, and Shabman (2017) estimated pre-FIRM properties to be around 16–20 percent of NFIP policies.

[31] The phased out of pre-FIRM from the NFIP was initially required under Section 100205 of BW-12, as revised by Sections 3 and 5 of the HFIAA.

[32] Although Congress has eliminated the practice of offering grandfathering to policyholders after new maps were issued in Biggert-Waters Insurance Report Act of 2012, the practice has been reinstated in HFIAA.

specific rating), which could be lower premiums for some policyholders. If private insurance can identify homes at lower risk than surrounding properties, they can offer lower premiums with better terms than comparable NFIP coverage because private insurance does not have the higher-risk NFIP policies that are underpriced either due to cross-subsidization or imprecise rate structures. This potential effect on the affordability of flood insurance could enhance flood insurance coverage nationwide.

Reduce Regulatory Burden

Prevent Lenders' Refusal to Accept Private Flood Insurance on FHA-Insured Loans

Since FHA's existing regulations on mandatory purchase requirements do not permit private flood insurance, lenders are refusing to accept private flood insurance on FHA-insured mortgages even if such policies provide more comprehensive coverage and/or are available at lower premiums. The proposed rule would remove this regulatory restriction, giving homeowners the option to purchase private flood insurance.

Reduce Affected Home Sales if NFIP Lapses

The NFIP is currently authorized until September 30, 2021. The NFIP was extended 17 times between 2008 and 2012 and lapsed four times in 2010–2011 and 2 times in 2018.[33] As shown in the past NFIP lapses, borrowers could not obtain flood insurance to close, renew, or increase loans secured by property in an SFHA until the NFIP was reauthorized. During the lapse in June 2010, the National Association of Realtors estimates that for each day that the NFIP lapsed, approximately 1,330 home sale closings were delayed or canceled nationwide, and home sale closings could reach 40,000 per month across the nation (Evangelou, 2017; Hepp, 2011). Although the NFIP had lapsed several times in the past years, Congress has passed short-term reauthorizations to avoid interruptions to the program, or Congress reauthorized the NFIP retroactively. However, in each instance of a lapse, there is uncertainty about when the NFIP would be reauthorized.

Focusing on FHA-insured mortgages that could be affected by the proposed rule, there were 34,203 residential properties in FHA-insured purchase transactions located in SFHA in 2017. On average, there were 94 home sale closings per day (34,203 divided by 365). Cancellation of home sale closings is unlikely to occur; however, it is possible that any lapse in NFIP could potentially delay home sale closings, and this would impose costs on homebuyers who are purchasing a home.

HUD assumes that in the case of a lapse, any closings scheduled on a day during which the NFIP lapses would be delayed by an average of 15 days, and households would incur costs during their delay equivalent to their existing housing costs. The average monthly housing cost is $1,074 for current owners and $991 for current renters; 15 days of such costs amount to $537 and $496, respectively. Each day of NFIP lapse is estimated to result in a total of $47,731 in costs to homebuyers (27 x $537 = $14,499 for current owners and 67 x $496 = $33,232 for current renters).

[33] Between 2008 and 2012, the NFIP lapsed four times. Recent NFIP lapses include between January 20 and January 22, 2018, and in the early morning of February 9, 2018, for approximately 8 hours during a brief government shutdown. See Horn (2019a).

Over the span of 9 years, there were six NFIP lapses. In terms of the total number of days, the NFIP lapsed for 55 days. Given this, the probability of lapse-related costs on any given day is 1.7 percent (55 days divided by 3,285 days), and the daily expected value of losses from an NFIP lapse is $811.43 for an annual expected cost of approximately $296,000.[34]

Conclusion

Current FHA regulations do not allow private flood insurance as an option and require mortgagors to obtain and maintain NFIP flood insurance for the duration of the mortgage to the extent NFIP is available. HUD is proposing to amend FHA regulations to allow mortgagors the option to purchase private flood insurance on FHA-insured mortgages for properties located in SFHAs in satisfaction of the mandatory purchase requirement under the National Flood Insurance Act of 1968. Acceptance of private flood insurance would benefit borrowers, particularly those in low-income communities that are located in higher flood risk areas, who want FHA-insured mortgages by providing them consumer choice, including the opportunity to obtain private flood insurance that is more affordable than NFIP policies. Overall, the proposed rule would reduce the regulatory barriers for borrowers with FHA-insured mortgages and enhance consistency with statutory and industry standards.

As mentioned, market failure was the original justification for NFIP. That could still be a reason not to expect significant growth in the private insurance market, especially in SFHAs. Allowing private sector participation in the provision of flood insurance would not by itself correct this market failure. The combination of moral hazard, NFIP's coarse rating and cross-subsidization, the geographic and temporal concentration of risk, and long-term risks of climate change needs to be addressed and incorporated in the structural reform of the program. Instead of short-term NFIP reauthorizations and stagnating reform initiatives, substantive reform of NFIP is needed.

Every time the NFIP is scheduled to be reauthorized is an opportunity to make significant changes to the program to improve its effectiveness. Several reform bills and legislations had been introduced or passed in the past but were not implemented after facing significant challenges. Thus, structural reforms have been difficult to accomplish. With the onset of private sector participation, reform legislation could work *in partnership* with the private sector to encourage the purchase of flood insurance and investment in cost-effective adaptation measures (see Kunreuther, 2018).

Even after FEMA conducted an affordability study (FEMA, 2018) that was required by Congress regarding participation in NFIP and affordability of premiums, there was no change in the pricing structure in NFIP.[35] Although there should be an affordability burden to the extent that taxpayers should not subsidize properties in higher risk areas, finding the right balance between risk and affordability for a policy change remains challenging. The promise of FEMA's new methodology, Risk Rating 2.0, which calculates premiums based on specific features of an individual property, could be a good start.

[34] Computed using 1.7 percent x $47,731 total cost per day x 365 days.

[35] FEMA, however, does not currently have the authority to implement an affordability program, nor does NFIP's current rate structure provide the funding required to support an affordability program. For further discussion, see Horn and Webel (2021).

Acknowledgments

The author would like to thank Alastair McFarlane and Kurt Usowski for providing guidance in preparing the regulatory impact analysis on the proposed rule and Mark Shroder for comments and suggestions on a draft of this article.

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References

Center for Insurance Policy and Research (CIPR). 2017. *Flood Risk and Insurance, CIPR Study Series 2017-1, April*. Kansas City, MO: Center for Insurance Policy and Research.

Czajkowski, Jeffrey, Howard Kunreuther, and Erwann Michel-Kerjan. 2012. *A Methodological Approach for Pricing Flood Insurance and Evaluating Loss Reduction Measures: Application to Texas*. Philadelphia, PA: Wharton Risk Management and Decision Processes Center.

Evangelou, Nadia. 2017. *How Many Home Sales Will Be Affected by a NFIP Lapse?* Washington, DC: National Association of Realtors.

Federal Emergency Management Agency (FEMA). 2018. *An Affordability Framework for the National Flood Insurance Program*. Washington, DC: Department of Homeland Security.

———. 2017. *Community Rating System Fact Sheet*. Washington, DC: Department of Homeland Security.

Hepp, Selma. 2011. *Lapses of the National Flood Insurance Program Jeopardize Home Sales*. Washington, DC: National Association of Realtors.

Horn, Diane. 2019a. *What Happens if the National Flood Insurance Program (NFIP) Lapses?* Washington, DC: Congressional Research Service.

______. 2019b. *Selected Issued for National Flood Insurance Program (NFIP) Reauthorization and Reform: Homeland Security Issues in the 116th Congress*. Washington, DC: Congressional Research Service, February.

Horn, Diane, and Jared Brown. 2018. *Introduction to the National Flood Insurance Program* (NFIP). Washington, DC: Congressional Research Service.

Horn, Diane, and Baird Webel. 2021. *Introduction to the National Flood Insurance Program* (NFIP). Washington, DC: Congressional Research Service.

______. 2019. *Introduction to the National Flood Insurance Program* (NFIP). Washington, DC: Congressional Research Service.

_____. 2018. *Private Flood Insurance and the National Flood Insurance Program*. Washington, DC: Congressional Research Service.

Kousky, Caroline. 2017. Financing Flood Losses: A Discussion of the National Flood Insurance Program, Discussion paper 17-03. Washington, DC: Resources for the Future.

Kousky, Caroline, Howard Kunreuther, Brett Lingle, and Leonard Shabman. 2018. *The Emerging Private Residential Flood Insurance Market in the United States*. Philadelphia, PA: Wharton Risk Management and Decision Processes Center.

Kousky, Caroline, and Brett Lingle. 2018. *Residential Flood Insurance in Puerto Rico*. Philadelphia: Wharton Risk Management and Decision Processes Center.

Kousky, Caroline, Brett Lingle, and Leonard Shabman. 2017. "The Pricing of Flood Insurance," *Journal of Extreme Events* 4 (2). DOI: 10.1142/S2345737617500014.

Kousky, Caroline, Leonard Shabman, and Brett Lingle. 2016. *NFIP Premiums for Single Family Residential Properties: Today and Tomorrow*. Washington, DC: Resources for the Future.

Kousky, Caroline, and Leonard Shabman. 2014. *Pricing Flood Insurance How and Why the NFIP Differs from a Private Insurance Company*. Washington, DC: Resources for the Future.

Kunreuther, Howard. 2018. "Improving the National Flood Insurance Program," *Behavioural Public Policy* 5 (3).

National Research Council. 2015a. *Affordability of National Flood Insurance Program Premiums: Report 1*. Washington, DC: The National Academies Press.

———. 2015b. *Tying Flood Insurance to Flood Risk for Low-Lying Structures in the Floodplain*. Washington, DC: The National Academies Press.

U.S. Government Accountability Office (GAO). 2017. *Flood Insurance Comprehensive Reform Could Improve Solvency and Enhance Resilience*. Washington, DC: U.S. GAO.

______. 2014. *Overview of GAO's Past Work on the National Flood Insurance Program*. Washington, DC: U.S. GAO.

Industrial Revolution

Every home that is built is a representation of compromises made between different and often competing goals: comfort, convenience, durability, energy consumption, maintenance, construction costs, appearance, strength, community acceptance, and resale value. Consumers and developers tend to make tradeoffs among these goals with incomplete information which increases risks and slows the process of innovation in the housing industry. The slowing of innovation, in turn, negatively affects productivity, quality, performance, and value. This department piece features a few promising improvements to the U.S. housing stock, illustrating how advancements in housing technologies can play a vital role in transforming the industry in important ways.

Panelization: A Step Toward Increased Efficiency in Homebuilding

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Abstract

This paper examines the current use of panelized components in homebuilding in the Oklahoma City (OKC) and Dallas-Fort Worth (DFW) areas. Panelization is a type of prefabrication in which certain framing components are built off site and then transported to the site for assembly. This technique has been reported to make homebuilding more efficient and affordable. Further, panelization may be one strategy to cope with the growing labor shortage. However, adoption in the United States varies and is relatively limited. To better understand the benefits and challenges of panelization, semi-structured interviews were conducted with 10 production homebuilders from the OKC and DFW metropolitan areas. Although most of the benefits (faster, more consistent, and less waste) and challenges (cost, logistics, and labor issues) were consistent with previous research, new benefits related to warranties and new challenges relating to transportation and delivery were identified. In addition, the study concludes that national and regional production builders differ in their priorities and perceptions of panelization: national builders are trying to increase their use of panelization, whereas regional builders are moving away from it.

Introduction

Panelization is a variation of factory-built construction (interchangeably referred to as *prefabrication*) in which components are produced in a factory setting and transported to the construction site. Unlike modular construction, in which nearly complete units are produced, panelization produces only components. Panelization typically refers to roof trusses, floor joists, and wall panels but may also include assembled floor or roof systems. In fact, the term *panelization* comes from *wall panels*. Unlike traditional stick framing, in which individual pieces of dimensional lumber are measured, cut, and fastened one piece at a time, panelized components are assembled in a factory and transported to the construction site, where they are installed (Boafo, Kim, and Kim, 2016; Lopez and Froese, 2016). For a home framed traditionally, each wall would be assembled piece by piece on site, whereas a panelized home has walls that arrive on the site already assembled and ready to be moved to the correct location and fastened in place on the basis of the floorplan.

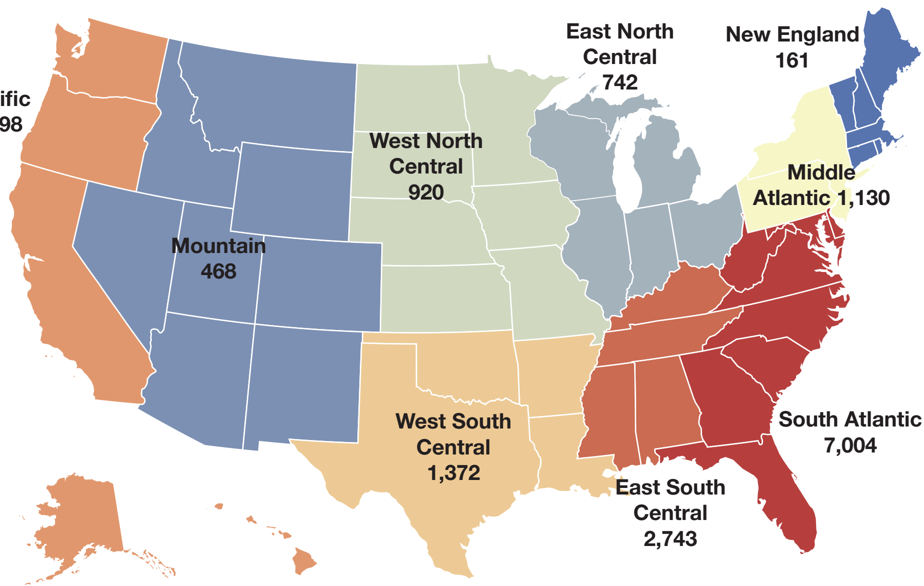
Some potential benefits to panelization are that onsite framing crews spend less time, less staffing, or both on each home, allowing for increased crew production and shorter build times than stick framing. Those efficiencies result from components arriving at the site ready for installation, without the need for measuring, cutting, and fastening each component—which also results in less job-site waste. By comparison, traditional methods require that each piece of lumber be measured and cut to fit the need. By limiting the need for measuring and cutting on site, panelization can also reduce the demand for skilled trades (Bernstein and Gudgel, 2011; Tam et al., 2007). Further, panelized homes reduce permit costs and construction time. According to Emrath (2017), the median permit value of a panelized single-family home was $69 per square foot compared with $89 per square foot for traditionally constructed homes, and construction time went down from 6.6 months to 5.8 months with panelization. Despite those potential advantages, according to the 2015 U.S. Census, only 3 to 4 percent of new, single-family homes (nonmanufactured homes) used panelized components (Steinhardt and Manley, 2016).

Prefabrication has a long history in the United States. In the 1600s, the English brought prefabricated wooden houses with them to Cape Ann, Massachusetts. In the mid-19th century, numbers of imported prefabricated homes continued to rise, especially during the California Gold Rush (Albert Farwell Bemis Foundation and Kelly, 1951). Housing was also mass produced in factories during the Great Depression and World War II to provide easily transported homes for soldiers (Fisher and Ganz, 2019; Musa et al., 2016). American companies such as Pacific Systems Homes, Inc. in Los Angeles and Sears, Roebuck, and Co. (Sears) were on the frontline of supplying prefabricated kit homes across the United States. Sears sold about 75,000 homes between 1908 and 1940 (Albert Farwell Bemis Foundation and Kelly, 1951; Redshift, 2019). By the 1990s, however, overall consumer interest in prefabricated homes declined due to overstandardization. Only a limited number of floorplans and elevations were available, limiting homeowners' ability to customize their homes or make changes (Mortice et al., 2019). Although prefabricated homes provided affordability, limited choices and inability to make changes turned away prospective buyers, particularly as demand grew for unique and personalized homes.

In 2017, there were 16,138 single-family panelized or pre-cut homes built in the United States. As seen in exhibit 1, adoption varies by region, with the South Atlantic region building the most homes this way, followed by the East South Central region. On the other hand, the New England and Mountain regions build the fewest.

Exhibit 1

Panelized/Precut Homes Started in 2017



Source: NAHB, 2018

According to a survey conducted by the National Association of Home Builders (NAHB, 2018), builders cited the following barriers to greater adoption of panelization:

- One-half indicated—
  - They would lose subcontractors.
  - It does not allow enough customization.
- Nearly one-third indicated problems with—
  - Customer perceptions.
  - Cost.
  - Reliability of delivery.
  - Insufficient information about methods.
- Almost one-fourth indicated—
  - Lack of trained workers.

- Excessive cost.
- Insufficient manufacturing capacity.

Those results from the NAHB survey are consistent with findings reported by Alazzaz and Whyte in 2015 and Tam and colleagues in 2007, suggesting that panelization has changed little in the past 14 years.

Despite the barriers reported in the survey and previous research, 66 percent of homebuilders in the NAHB (2018) survey would implement more panelized construction if the construction costs were lower. Further, 55 percent reported that the quality and consistency of products encourage use. The body of research points to many advantages of panelization, but seemingly contradictory results (lower cost based on permit value are reported, but homebuilders say the cost is actually higher) suggest that inconsistent adoption throughout the country should not be surprising. That study explored the extent of use of panelization and the perceptions of builders on the subject to identify challenges and benefits that could confirm or refute previous research results and better understand why builders adopt or reject panelization.

Methods

This study investigated the Oklahoma City, Oklahoma (OKC), and Dallas-Fort Worth, Texas (DFW), markets to explore the subject of panelization from a builder's perspective. This study asked the following research questions:

- What is the extent of panelization among production homebuilders in these regions of the United States?
- What are the perceived benefits of panelization to production homebuilders in these regions?
- What are the perceived challenges of panelization to production homebuilders in these regions?

Unlike custom homebuilding, in which each home is unique, a production homebuilder uses defined sets of home plans with limited options to gain economy of scale. Production homebuilders are often classified by the scope of their organization. National builders operate in multiple markets across the country and may build tens of thousands of homes yearly, whereas regional builders are usually confined to a single market or region and thus build fewer total homes each year. A single market may have regional builders with greater volume than the national builders in that same market, however. Both regional and national production builders were included in this study.

A qualitative research strategy using data collected through structured interviews with production homebuilders was used to address those research questions. Representatives of both national and regional production homebuilders in the DFW and OKC markets participated. The builders recruited for this study build more than 400 homes a year, and the representatives interviewed were all considered decisionmakers in their respective organizations. Upon completion, interviews were transcribed, and the researchers used thematic analysis to identify and code themes that emerged from the data. Open coding was used to form the initial themes. Once the initial themes were identified, the researchers conducted confirmatory analysis by reviewing the interview transcripts a second time. A different member of the research team conducted a third pass to provide interrater reliability on the identified themes.

The sample included 10 production homebuilders, of which 3 were regional homebuilders in the OKC area, 3 were production builders in the DFW area, and 4 were national builders who also build in the region. Participants were chosen through convenience sampling based on the researcher's professional network. Nevertheless, with 10 unique homebuilders interviewed, the sample should be considered representative of the region. These data were collected in late 2019, so recent developments in homebuilding resulting from the COVID-19 pandemic did not affect the data.

Findings and Discussion

The first research question—*What is the extent of panelization among production homebuilders in this region?*—yielded mixed findings. The extent of panelization among the participating homebuilders varied between regional and national builders and by the state in which they build. All four of the national builders who participated use panelization. Three of the four builders base the extent of use on the market, whereas the fourth uses it on all homes. In contrast to the national builders, only two of the six regional builders currently use panelization. All three regional builders in Dallas-Fort Worth have used panelization, and two continue to use it. On the other hand, in Oklahoma City, two have tried it, but none currently use it. Exhibit 2 displays the results related to this question.

Exhibit 2

Extent of Use of Panelized Components

Company	Full Use	Some Use	No Use
Regional Builder 1, OK		Past	X
Regional Builder 2, OK			X
Regional Builder 3, OK		Past	X
Regional Builder 4, TX		Past	X
Regional Builder 5, TX	X		
Regional Builder 6, TX	X		
National Builder 1		Market Dependent	
National Builder 2		Market Dependent	
National Builder 3	X		
National Builder 4		Market Dependent	

Note: Regional Builders 1, 2, and 3 operate in Oklahoma, and Regional Builders 4, 5, and 6 operate in Texas.
Source: Authors' compilation based on interviews conducted for this study

The second question this study sought to address was, *What are the perceived benefits of panelization to production builders in this region?* Analysis of the interviews resulted in 55 responses on the benefits of panelization. From those responses, the following themes emerged: time savings, labor savings, cost savings, and improved quality. Most of the benefits were consistent with previous research, but some unique findings surfaced.

Saving time and cost of construction were themes consistent with previous research. All respondents reported that panelization is faster and results in shorter construction times. One builder reported that panelized framing required 3 to 4 days, whereas stick framing requires 5 to 7 days. Although all 10 builders reported time savings, cost savings were not as consistent. Four builders mentioned cost savings related to materials from panelization, and three indicated savings on labor.

Beyond time and cost savings, quality was another benefit. Quality was reported in three different ways. Seven builders reported better consistency, six reported less waste, and two indicated that panelization gave them a better warranty. Greater consistency and less waste have been reported previously, but a better warranty is a benefit to panelization that was not found in previous research. One of the national homebuilders explained: "We tend to have much fewer warranty issues … we tend to have less cracking, less nail pops, less movement in the system, so it's a better warranty for us." Exhibit 3 displays the benefits that emerged from the interviews and their frequency.

Exhibit 3

Identified Benefits of Panelization

Benefits	% of Builders	OK1	OK2	OK3	TX1	TX2	TX3	N 1	N 2	N 3	N 4
Time Savings	100%	X	X	X	X	X	X	X	X	X	X
Labor Savings	30%		X	X							X
Material Savings	40%		X	X			X				X
Consistency	70%	X	X	X		X		X	X	X	
Less Waste	60%		X		X	X	X		X		X
Warranty	20%					X		X			

N = National. OK = Oklahoma. TX = Texas.
Source: Authors' calculations based on interviews conducted for this study

With no current use of panelization in Oklahoma City and one of the regional builders in Dallas-Fort Worth recently abandoning it, the challenges or drawbacks to this building method are important to consider. Interviews revealed more than 100 challenges to panelization adoption. From those, five themes emerged, with 12 specific challenges. The builders most frequently reported issues relating to labor, cost, and complexity. Exhibit 4 displays the results.

Exhibit 4

Challenges to Panelization

Theme	Drawbacks	% of Builders	OK1	OK2	OK3	TX4	TX5	TX6	N1	N2	N3	N4
Labor	Framers dislike	30%		X	X		X					
	Labor shortage	70%	X	X	X				X	X	X	X
	Lack of education	40%	X	X			X		X			
Cost	Upfront cost	20%		X								X
	Construction cost	80%	X	X	X	X		X	X		X	X
Availability/ Complexity	Lack of production capability	20%		X						X		
	Lack of manufacturing facilities	70%	X	X	X		X		X		X	X
	Complexity of projects	70%	X		X	X	X	X	X			X
	Customer ability to change	40%	X				X	X				X
Logistics	Tight lots	40%		X	X		X			X		
	Transport/ deliveries	30%	X				X			X		
Perceptions	Customer perceptions	20%					X		X			

N = National. OK = Oklahoma. TX = Texas.
Source: Authors' calculations based on interviews conducted for this study

Finding the labor force with the proper skill set is essential to implement panelization. Eight of the 10 builders reported some type of labor challenge, whether it was framers who disliked the panels because of size or their lack of experience and knowledge working with panelized components. One builder indicated, "Generally speaking, trades do not have much interest in working with prefabricated components due to their weight and dimension." Roof trusses are a good example of this challenge, as the prefabricated trusses can be very large and, as a result, heavy. They may even require the use of a crane to lift them into place. Labor's preferences and lack of willingness to work with panelization are major challenges to greater adoption of the method.

Beyond preference, labor cost associated with panelization was reported as a challenge by 8 of the 10 builders—a contradiction to the reported benefit of panelization in reducing costs. Framing contractors generally base their price on the square footage of a home, and they want the same price whether they are using panels and trusses or stick framing. As a result, labor costs are not always reduced by panelization, which suggests that framers do not take into consideration the reduction in labor hours when using panelized components. Those challenges with labor are magnified given the current labor situation, in which trades can pick and choose the jobs they take.

In addition to labor costs, material costs were reported as a challenge. Despite past research and results from this study indicating that panelized homes cost less, the material cost of panelization was a challenge reported by 9 of the 10 builders. Some builders were turned off by the higher cost of panelized components compared with the raw lumber used for stick framing. For one builder, it was more than double the price, so they did not consider panelization competitive; however, these builders did not account for the savings realized through reduced waste and quicker framing time, which may explain why cost emerges as both a benefit and challenge of panelization.

Beyond the cost of materials and labor, availability and complexity were challenges reported by the builders. Panelization is difficult to implement when components are not readily available. One builder in Oklahoma did not believe the local truss and panel supplier could keep up with their demand. As a result, they would have to source products from Wichita, Kansas, or Dallas, Texas, to implement panelization. Having production facilities in Texas did not seem to place the builders in Dallas-Fort Worth at an advantage, however; all builders operating in Texas indicated a shortage in the supply of panelized components.

Sourcing the materials was not the only logistic challenge. A few builders noted the challenges with transportation and issues with receipt and staging of the materials. Production homebuilding has long been a means to providing affordable housing, but rising land prices have led to smaller lot sizes. The smaller lots do not allow adequate staging areas for panelized components before installation. One builder put it this way: “Lot sizes are smaller, and there’s just not much room on the lots to put deliveries, and most cities don’t want you to deliver them in the streets.” In some cases, the lot simply does not have enough room on which to deliver panel or truss packages.

Beyond those logistical challenges, the complexity of design was also an issue in the supply chain. Seven of the 10 builders reported that panelization could not meet the demand of home designs as related to the shape or slope of the roof. Further, four builders pointed out the inability of panelization to allow for or adjust to customer changes.

The final challenge to panelization reported by builders was customer perceptions. Although only two builders reported this challenge, its implications are substantial. The homebuilding business is driven by homebuyers, so customer perceptions can have a dramatic impact on what builders do. One regional and one national builder reported that customers equate the panelized components to a lower quality product. Those perceptions are further exacerbated in the sales and marketing process. One builder reported that their competitor’s sales personnel were equating panelized products to manufactured homes—as a tactic to sway buyers—which almost certainly results in the loss of sales for the builder using panelization and is thus a barrier to its further implementation.

Conclusions

The interviews conducted were targeted to identify the extent of the use of panelization and the challenges that prevent its widescale adoption. Innovation in construction is often met with resistance, and panelization is no different. Resistance was seen in the challenges reported. Although the builders interviewed reported more challenges than benefits, that does not mean panelization should be abandoned. In fact, despite the challenges reported, nearly all homebuilders interviewed believed that the quality of panelized products is superior compared with traditional stick-built construction. Further, the national homebuilders who are using panelization are trying to increase its use within their companies. For the regional builders not using panelization, the decision seemed based as much on preference as on any specific set of challenges identified.

Direct costs (labor and materials) were cited as a challenge to adoption, but many builders did not seem to consider the other cost variables that panelization affects. A reduction in build time would reduce the direct overhead cost of supervision and, potentially, the carrying costs related to financing a home under construction for a longer period. In addition, lack of education by the trades about panelization is a challenge that should be addressed to increase adoption. Panelization should make construction faster and allow for a smaller crew, both of which should drive down the labor costs of panelization and positively affect the skilled labor shortage. If trades are not trained and educated about the process, however, those savings are never realized, and, paradoxically, costs of panelization become reported as both challenges and benefits.

Whereas all the builders faced some challenges, other challenges seem to be unique. For example, only the regional homebuilders reported that framers disliked panelized construction. The challenge of the labor shortage, on the other hand, was reported by all national builders but only one-half of regional builders. Perhaps the biggest difference between regional and national builders was their overall attitude toward panelization. The national builders not only use panelization to some extent but are pushing for greater levels of adoption. Regional builders, on the other hand, are moving away from it. That difference seems to be resource based, as national builders are more likely to employ individuals dedicated to managing supply chain issues and improvements, whereas regional builders generally do not have those positions. Although they are all production homebuilders, differences in perspectives and priorities between regional and national builders affect panelization adoption.

The authors recommend future study on this issue in other regions and markets in the United States to determine if the results here are unique to Oklahoma and Texas or are consistent on a broader scale. In addition, further study should be undertaken to explore the differences discovered here regarding regional and national builders.

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References

Alazzaz, Faisal, and Andrew Whyte. 2015. "A Review of Current Barriers (Real and Perceived) to Off-Site Construction." In *Proceedings of 21st TheIIER International Conference*. Bhubaneswar, India: International Institute of Engineers & Researchers: 27–31.

Albert Farwell Bemis Foundation and Burnham Kelly. 1951. *The Prefabrication of Houses*. Amsterdam, Netherlands: Amsterdam University Press.

Bernstein, Harvey M., and John Gudgel. 2011. *Prefabrication and Modularization: Increasing Productivity in the Construction Industry*. New York: McGraw-Hill Construction. https://www.nist.gov/system/files/documents/el/economics/Prefabrication-Modularization-in-the-Construction-Industry-SMR-2011R.pdf.

Boafo, Fred Edmond, Jin-Hee Kim, and Jun-Tae Kim. 2016. "Performance of Modular Prefabricated Architecture: Case Study-Based Review and Future Pathways," *Sustainability* 8 (558): 1–16.

Emrath, P. 2017. *System-Built Single Family Homes in 2017*. NAHB Summary. Washington, DC: National Association of Home Builders.

Fisher, Lynn M., and Scott Ganz. 2019. "Will Homebuilding Finally Evolve? Lessons from the American Experience with Factory-Built Housing," *Economic Perspectives*: 1–14.

Lopez, Diana, and Thomas M. Froese. 2016. "Analysis of Costs and Benefits of Panelized and Modular Prefabricated Homes," *Procedia Engineering* 145: 1291–1297. DOI:10.1016/j.proeng.2016.04.166.

Mortice, Z., Matsunaka, Y., Yoshida, M., and Redshift Video. 2019. "The History of Prefabrication, From Roman Forts to Modern Modular Housing," San Rafael, CA: Autodesk. Retrieved April 17, 2020. https://www.autodesk.com/redshift/history-ofprefabrication/.

Musa, Faiz Muhamad, Mohd Reeza Yusof, Mohammad Fadhil Mohammad, and N.S. Samsudin. 2016. "Towards the Adoption of Modular Construction and Prefabrication in the Construction Environment: A Case Study in Malaysia," ARPN *Journal of Engineering and Applied Sciences* 11 (13): 8122–8131.

National Association of Home Builders (NAHB). 2018. *Housing Market Index: Special Questions on Building Systems*. Washington, DC: NAHB.

Steinhardt, Dale A., and Karen Manley. 2016. "Adoption of Prefabricated Housing—The Role of Country Context," *Sustainable Cities and Society* 22: 126–135. DOI: 10.1016/j.scs.2016.02.008.

Tam, Vivian W.Y., C.M. Tam, S.X. Zeng, and William C.Y. Ng. 2007. "Towards Adoption of Prefabrication in Construction," *Building and Environment* 42 (10): 3642–3654.

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Volume 23 Number 3 • 2021