



Vulnerable People, Precarious Housing, and Regional Resilience: An Exploratory Analysis

by

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Abstract

This paper has two purposes. First, it explores the ideas of vulnerability, precariousness, and resilience as they apply to people, housing, neighborhoods, and metropolitan areas. People might be more vulnerable to shocks or strains, we propose, if they are members of racial/ethnic minorities, recent immigrants, non-high school graduates, are children or over 75 years old, disabled, recent veterans, living in poverty, or living in single-parent households. Housing may be more precarious, we propose, when it is rented, multi-family, manufactured, crowded, or subject to overpayment.

The paper goes on to document the relationships between potential personal or household vulnerability and potentially precarious housing conditions. Microdata from the 2005-2007 American Community Survey suggest that an important minority of people have multiple vulnerabilities; these vulnerabilities associate with residence in precarious housing. We suggest that policy be directed toward precarious situations most likely to afflict the most vulnerable populations, especially single-parent households and immigrants.

Introduction

Research on resilience suggests that we can improve our insights about neighborhood, city, and regional dynamics if we understand them within and across multiple levels, from the individual to the global. Resilience at the neighborhood or city scale is threatened by high levels of vulnerability among residents, as amply demonstrated by recent disasters from New Orleans to Port-Au-Prince to Pakistan. We know less, however, about the connections between precarious housing conditions, personal vulnerability, and regional resilience.

This article contributes to the study of resilience by showing the extent to which vulnerable people live in precarious housing situations in large metropolitan areas across the U.S. After providing a background on resilience, vulnerability, and precarious housing conditions, we describe the research questions motivating this work, along with the data, and methods we use to address them. The article continues with the findings from our analyses and concludes with a discussion of how by understanding the overlap between vulnerability and precarious housing, regions can better prevent, mitigate, and recover from, adverse shocks.

Regional resilience, vulnerable people, and precarious housing

Scholarship across a wide range of fields has employed the *resilience metaphor* for illuminating systemic responses to strains and shocks. Recently, the resilience concept has crept from psychology, ecology, and other fields into research on regional growth and development (Simmie and Martin, 2010; Pendall,

Foster, and Cowell 2010). In social science fields, as in conventional speech, “resilience” often has a strong normative component, an optimistic sense that people and cities will bounce back to equilibrium in the face of adversity. Even more optimistically, some observers focus on shocks or strains that make people stronger. A simple definition of resilience here, then, might be “success under stress.”

Some observers gauge *regions’* resilience based on how well their governance systems respond to significant cross-border issues (Foster 2010; Swanstrom, Chapple, and Immergluck 2009). Responding to incentives from higher levels, local actors invent responses at the regional scale that sometimes improve and sometimes reduce the ability of individuals to lead fulfilled and secure lives in the face of strains and shocks. A resilient region, then, is one whose governance decisions identify and anticipate stresses, avoid those that can be avoided, and mitigate those that cannot, thereby protecting individuals and households from many harms and helping them recover from others.

Vulnerability has intrinsic connections with resilience. Several authors have tried to establish the meaning of vulnerability, for example, identifying those who are exposed to climate change, natural disasters, economic decline, and gentrification (McCarthy et al. 2001; Adger 2006, Freeman). Other research has defined vulnerability not relative to an outside shock, but as a condition of households (Theodos et al. 2010; Coulton, Theodos, and Turner 2009). Vulnerable people or cities are, by definition, more likely than other people and cities to suffer from a shock or strain in the first instance and will have trouble regaining or maintaining pre-shock (or pre-strain) function thereafter.

Much scholarship on resilience and vulnerability presumes that all systems contain embedded subsystems and in turn also constitute part of one or more larger systems. Systems with invulnerable subsystems will be more resilient than those with many vulnerable subsystems; likewise, vulnerable subsystems can be protected (and thus more resilient) when nested within highly functional supersystems.

Most work on metropolitan development focuses on neighborhoods within regions, but it is also important to begin at a finer scale of analysis—people and households—as a foundation for understanding how the concentration of people and housing in space influences regional outcomes. We find it useful to distinguish between two different kinds of vulnerability: that associated with the personal characteristics of individuals, and that which is derived from their living situations. For clarity, we will reserve the term vulnerability to refer only to the former and the term precarious for the latter.

Although not the focus of this paper, all of this takes place in a larger environment: the natural, built, social, and economic systems in which people operate and their situations are located. Environments can be turbulent either because of sudden events or episodes (e.g., earthquakes, military base closures) or because of medium- or long-term stresses (fast growth, immigration, civil conflict). Figure 1 depicts how these factors could overlap at the regional level.

Insert Figure 1 about here

The conceptual diagram suggests that regional governance systems can improve people’s lives by focusing on any or all of the three conditions; in doing so, they promote resilience. For individuals,

governance systems can reduce personal vulnerability, for example, by providing income supports for destitute people or free public education for all children. Governance can reduce precarious situations by imposing building codes or providing adequate supplies of affordable housing. And governance can reduce turbulence in the broader environment by adopting laws that limit predatory financial practices, for example, or watershed management strategies that reduce paving. Indirectly, regional protections against stresses upon people and households allow the regional society to function with greater synergy, because disruptions to individuals and households within a region can threaten the social, business, and civic networks that make conurbations more useful than widely dispersed individuals and households. Governance systems can also build regional resilience directly by fostering and maintaining strong networks.

Our focus for the remainder of this article, however, is on the conditions of vulnerability and precariousness at the individual, household, and housing unit level that face local and regional governance systems.

Personal vulnerabilities

We know too little about the extent to which vulnerable people live in precarious housing. For this paper, we identify 11 illustrative vulnerabilities that could systematically hinder people's life chances. We explore this set of potential personal vulnerabilities and the extent to which they overlap with precarious housing situations in 84 metropolitan areas. We acknowledge that households could face other vulnerabilities, but for the purpose of this paper, the vulnerable factors we explore and test for their overlap with precarious housing include age, race, immigration, family structure, military service, poverty, education, and health factors. As we show below, many households face more than one of these barriers.

Adults over 75 years old and the **disabled** are more likely to report limitations in their usual activities than their younger, non-disabled counterparts (U.S. Dept. of Health and Human Services, 2009). Such limitations often require housing modifications and long-term care (Newman, 2003; Johnson, Toohey, and Wiener 2007), both of which would make it difficult for these populations to adapt to changes in their housing situation, particularly if relocation were required.

African Americans, Hispanics, and American Indians or Alaskan Natives tend to have fewer resources than their white counterparts when faced with financial shocks. They are significantly less likely to have health insurance, have lower median incomes, higher levels of unemployment and poverty, have less than one-tenth the median wealth of their white counterparts, and face discrimination (DeNavas-Walt, Proctor, and Smith 2009; U.S. Department of Labor and U.S. Bureau of Labor Statistics 2009; Wolf 2010; Bishaw and Semega 2008; Krivo and Kaufman 2004; Ross and Turner 2005).

Iceland and Scopillitto (2008) found that **recent immigrants (post 1990)** are more segregated than immigrants who have been in the U.S. longer. They are also less likely to own their homes compared to immigrants who have been in the United States longer and native citizens (Borjas, 2002). Discussing Hispanic immigrants, Oliveri (2009) suggests landlords can take advantage of and discriminate against

recent immigrants. Also, language barriers, which are more of a problem for more recent immigrants, can act as an impediment to finding housing.

Adults without a high school diploma have fewer resources than those with a high school degree, such as lower employment rates, lower incomes, lower median levels of wealth, and are in worse health (Sum, Khatiwada, and McLaughlin 2009; U.S. Census, 2008, Table 705; U.S. Department of Health and Human Services 2009).

Those living **below the poverty line** hold fewer assets and have higher debt to income ratios than individuals living above the poverty line, making it difficult to build up assets. (Wagmiller 2003). Adding to the cyclical pattern of poverty, Barr and Blank (2008) found that poor families face less stable employment and earnings, and lack access to the same financial services used by middle-income and high-income families (Barr and Blank 2008).

The Bureau of Labor Statistics (2010) reported that **post-1990 veterans** faced higher unemployment rates than nonveterans. Recent veterans also face higher rates of divorce and mental disabilities, especially post-traumatic stress disorder, depression, chronic fatigue syndrome, and traumatic brain injury (Kang, et al. 2003; Tanielian and Jaycox 2008; Kelty, et al. 2010).

Children under 18 can face particular barriers when compared to adults, as they depend on their guardians for protection, direction, and support. For example, lack of stable housing can negatively affect children under 18, as children who moved frequently were more likely to have failed a grade and were more likely to have four or more behavior problems (Wood, et al. 1993).

Single-parent households experience high poverty rates and lower incomes. Female-headed households had over five times the poverty rate and less than half the income of married households in 2008 (DeNavas-Walt, Proctor, and Smith, 2009). Yamokoski and Keister (2006) found that single parents had lower wealth than their married counterparts. Children growing up in single parent households were twice as likely to drop out of high school or have child before age twenty, and more likely to be unemployed and not in school in their late teens (McLanahan 2004; McLanahan and Sandefur 1994).

Precarious housing

Housing situations interact with family characteristics to produce protective or precarious outcomes. For example, economic decline and population loss disproportionately place households in certain kinds of housing at risk. Property owners logically reduce their investment in rental property, and older housing units lose their value rapidly, especially if new construction continues in desirable suburban and rural communities. Or, consider the scenario, present in many urban areas in the late 1990s and early 2000s, of a rapid appreciation in housing prices. As illustrated in the figure below, this stressor interacts differently with different types of housing stock. While homeowners may be forced to sell if they are unable to afford rising property taxes, they benefit financially from appreciating home prices. Renters, however, are at risk in a rapidly appreciating housing market. Absent policy protections like rent controls or condominium conversion restrictions, these households may be forced to move if the owner

of the property decides to upscale the rental housing, convert the units to condominiums, or replace mobile-home parks with more profitable land uses.

Insert Figure 2 about here

We identify five types of housing situations which may be precarious—either conditions describing the physical structure of the building or the relationship between a family and their home. These situations include overcrowding and high housing cost burdens, and precarious dwelling units, such as rental units, older units, and units of particular structure types—specifically, multi-family dwellings and mobile homes. Housing units in these situations are more likely to change than other units in the face of stress, and even where the units do not change, the households living in these situations are at greater risk for being adversely affected.

Overcrowded housing has been linked to detrimental effects for both parents and children. Gove, Hughes, and Galle (1979) linked overcrowded housing with physical and psychological withdrawal, and poor marital relations, physical health, mental health, and parenting. They also found that overcrowded housing lacked spaces for children to study. Connected to this, Goux and Maurin (2003) found that children growing up in crowded housing will be more likely to fall behind in school than children growing up with one child per room, all else equal.

Households facing high **housing cost burdens** use more of their income for housing, and consequently have less income to save or to spend on other necessities. The federal government sets the standard for unaffordable housing to be more than 30 percent of household income.

Renter occupancy can subject a housing unit to either gradual deterioration or sudden change. Decisions about investor-owned housing are less bound by sentiment and attachment to place than those about owner-occupied houses. Neighborhoods with more rental units have lower levels of social capital and higher rates of mobility (DiPasquale and Glaeser 1999). Market considerations and operating costs can result in disinvestment, mothballing, or even abandonment in periods of slack demand, in rapid upscaling (condominium conversion, for example) when a more affluent clientele enters the picture, or in demolition and reconstruction when other uses appear more profitable.

As housing structures **age**, their major systems (e.g. roofs, furnaces) need replacement, forcing property owners to make significant expenditures. Liu (2005) and Williams (2004) found that older homes have higher maintenance and energy costs. Because maintenance costs are variable, the maintenance needs of older housing would be particularly problematic for low-income and low-wealth families. In some circumstances, older single-family homes are difficult to adapt to the needs of changing households; incumbent households change as they age and lose members, while new households may have different tastes, family structures, and locational preferences. Sometimes older single-family homes shift to renter occupancy; ownership by absentee landlords only increase the vulnerability of these older houses (Mallach 2009). Institutional rigidities—including deed restrictions enforced by homeowner associations, local building codes, and strict zoning laws—also can make it difficult to modify single-family houses, though such restrictions can have positive externalities for neighborhoods that shield large numbers of

dwellings from the cumulative impacts of incremental changes in the stock. Certain types of older single-family stock may also, however, come “back into style.”

Multifamily housing's susceptibility to change is widely recognized. This susceptibility depends, however, on construction quality and capital investment. Garden apartments and small multi-family structures require only inexpensive wood-frame construction and no elevators. In certain periods, favorable federal policy (especially tax-code provisions) spurs lightning-fast apartment and condominium construction. Under such conditions, some builders reduce their attention to detail and quality. High-rise, steel frame elevator buildings with structured parking, by contrast, are less vulnerable to rapid change. While much of the vulnerability of multi-family housing is a direct consequence of its rental tenure, combinations of structure type and tenure may also combine in complex ways to condition the vulnerability of units. Rented single-family homes and two- to four-unit multiples may be quite vulnerable to degradation because their landlords lack experience and capital, although owner-occupancy within the building can sometimes mitigate management shortcomings (Mallach 2009). Smaller structures may also be more vulnerable to upgrading and conversion to owner-occupancy in hot markets. Large rental complexes, by contrast, are often professionally managed and command higher rents than small multiples, possibly reducing their precariousness compared with smaller structures during downturns but more likely to experience rent increases during upswings (Gilderbloom and Appelbaum, 1988).

Mobile homes and trailers built before 1976, when HUD promulgated manufactured-housing standards, experience rapid depreciation; owners of manufactured housing sometimes defer investments if (as is common) they lease the pad on which their units sit (Herbert and Belsky, 2008; Genz, 2001). Additionally, consumers of manufactured housing are more likely to face predatory retailers and lenders. Because manufactured housing is considered personal property, it is not governed by the Real Estate Settlement Procedures Act; retailers of manufactured housing can steer clients toward specific lenders, where they will earn referral fees, which are need not be disclosed to the consumer (West, 2006; Genz, 2001). Furthermore, because dealers are not always required to display the MSRP of a manufactured home and because appraisals are not used in manufactured housing as they are used in site-built homes, consumers often pay more than what the mobile is actually worth (West, 2006). For these reasons, manufactured homes have higher loan default rates than owners of site-built homes (Genz, 2001).

Stress is likely to produce changes that place vulnerable households at risk. When their home quality deteriorates, vulnerable households are less able than other people to protect themselves. When housing quality improves, costs (rents and property taxes, for example) often increase. In either case, vulnerable households who feel compelled to move to other housing units will probably suffer more from the disruption and cost of dislocation than will people who are not vulnerable.

Research questions, data, and methods

We address the following research questions in this article:

1. To what extent do *individual vulnerabilities* occur and coincide in people and in households in major U.S. metropolitan areas?
2. Are personal vulnerabilities good predictors of living in *precarious housing*?

To conduct our analysis, we use data from the aggregated 2005-2007 American Community Survey (ACS), extracted from the IPUMS-USA database (Ruggles et al., 2010). Our unit of analysis is individuals. We first discuss the incidence of 11 characteristics that can make people more vulnerable to shocks and strains. Second, we assess the degree of coinciding vulnerabilities within the same people and the same households. We show how some vulnerabilities correlate with others; report on the incidence of low, medium, and high numbers of vulnerabilities; and discuss the extent to which households have numerous individuals with multiple vulnerabilities in them. We then use multivariate regression to test the independent association between vulnerabilities and precarious housing. To assess the overlap between vulnerability and housing tenure, overcrowding, overpayment, living in non-single family housing, and living in old housing, we use a binary logistic regression, holding constant other individual characteristics. Our data cover 84 metropolitan areas in the U.S. and represent over 198 million people in 2005-07, nearly two-thirds of the national population. For a listing of these 84 metro areas and the 15 major geographic groups into which we classify them, see Appendix A.

Findings: Vulnerable people and precarious housing in metropolitan America

Vulnerability in people and households: Incidence and correlation

In all, only three out of 10 residents in 2005-07 had none of the 11 personal vulnerabilities we tracked (Table 1). Slightly more, about 32 percent, had one vulnerability, and one in five had two. The balance, 17 percent, had three or more vulnerabilities.

Insert Table 1 about here.

The most common vulnerabilities in these metropolitan areas in 2005-07 were those collectively relating to ***ethnicity and recent immigration***. Together, 31 percent of residents were Hispanic, black, or American Indian/Alaska Native. Nearly 35 million people (17.6 percent) were Hispanics, almost 27 million (13.4 percent) were non-Hispanic black, and 740,000 (0.4 percent) were non-Hispanic American Indian/Alaska Native. About 10 percent of people had immigrated since 1990.

Minority racial/ethnic status and recent immigration heighten the probability of experiencing additional vulnerabilities. Only 24 percent of black residents in 2005-07 had no other vulnerabilities, 35 percent had only one other, a quarter two others, and 16 percent three or more. Among these additional vulnerabilities, living in single-parent households (45 percent) or below the poverty line (25 percent) or being children (29 percent) were the most common for blacks. Only 18 percent of Hispanics had no other vulnerabilities; almost as many (17 percent) had three or more additional vulnerabilities, and over a quarter had two. Hispanics' most common additional vulnerabilities include being under 18 years old (one-third), living in single-parent households (31 percent), and being a recent immigrant (26 percent). About 30 percent of American Indians had no other vulnerabilities, 37 percent only one, 22 percent two, and 12 percent three or more. About 38 percent of post-1990 immigrants had no other vulnerability

beyond their immigration status and their ethnicity, making them the least likely of any of these groups to have additional vulnerabilities; another 37 percent had one other vulnerability.

About a quarter of residents in these areas were **less than 18 years old** in 2005-07. More children have no other vulnerabilities than have one or more additional vulnerabilities; the most common additional vulnerabilities in 2005-07 for children included living in a single-parent household (31 percent), being Hispanic (26 percent) or African American (16 percent), or living in poverty (18 percent).

At the other end of the age spectrum, those **75 and older** constitute about 5 percent of the population in these 84 regions. Over half of “old-old” people report at least one disability. Over a quarter of those over 75 lack a high-school diploma. About 17 percent of those over 75 reported living below poverty.

About 22 percent of people lived in **single-parent households** in 2005-07. About 35 percent of people in single family households are children; 27 percent are non-Hispanic black; and one-quarter are Hispanic. One in four people in single-parent households live in poverty.

About 14 percent of residents lived in **poverty** in 2005-07. While poverty afflicts only a minority of Americans, that minority faces enormous challenges not only because they have too little income but also because they usually have other vulnerabilities as well. Over 63 percent of those below poverty in 2005-07 had at least two additional vulnerabilities, and 32 percent had three or more. Only 14 percent of people below poverty had no other personal vulnerabilities. Two-fifths of people in poverty lived in single-parent households, and about one-third of people in poverty were children. Thirty percent of people in poverty were Hispanic, 25 percent were black and non-Hispanic, and one-fifth had one or more disabilities. Poverty rates in 2005-07 exceeded the average for people with all the vulnerabilities we considered except recent veterans, about 10 percent of whom lived below poverty during this survey period. About a quarter of the disabled population, people in single-parent households, and African Americans lived below the poverty line in 2005-07; between one-fifth and one-fourth of Hispanics, American Indians, recent immigrants, and non-high school graduates also lived below poverty. Poverty rates were modestly lower than this for people over 75 and for children (17 percent and 18 percent, respectively).

Twelve percent of people in the national sample had at least one **disability**. Over two-fifths of the disabled population had two or more additional vulnerabilities, the most common of which were not having graduated from high-school (27 percent), being 75 or over (25 percent), and living below poverty (24 percent). Only a quarter of the disabled had no other vulnerabilities.

Almost 11 percent of those over 18 years old had **not graduated from high school** in 2005-07. A quarter of non-graduates had three or more other vulnerabilities, and nearly a third had two others, making them one of the adult groups facing the most serious personal challenges. Only 14 percent had no other vulnerabilities. Two-fifths were Hispanic, 30 percent had at least one disability, 28 percent lived in single-parent households, and 26 percent lived in poverty. Logically, many of these vulnerabilities are connected in complex and mutually reinforcing ways with one another.

We included **recent military veterans** based on concerns that the stress of service can expose them to difficulties in their personal lives and the housing market. Most indicators, however, suggest that post-1990 veterans are less likely to experience additional vulnerabilities than other groups; half of recent military veterans had no other vulnerability in 2005-07. Veterans' most common additional vulnerability is being a member of a racial or ethnic minority; in 2005-07, about 30 percent of veterans were African American (17 percent), Hispanic (12 percent), or American Indian (0.6 percent). We continue our analysis of the housing experience of veterans in the remainder of this paper; at the same time, we question our own label of veterans as "vulnerable" pending further analysis of how military service might aggravate, lead to, or protect from other personal and housing challenges.

Since most people live together in households, we can better understand personal vulnerability by describing the range of *vulnerability within households*. People who themselves have many vulnerabilities but live in households with others who have few or no vulnerabilities may be better protected than those with few vulnerabilities within a household of other people facing many personal challenges.

Across all households with over one member, increasing vulnerability at the personal level associates with higher levels of vulnerability among others in the household. Among those who live in multi-person households, over 90 percent of those with no vulnerabilities share their dwelling with people who have, on average, one vulnerability or less. At the other end of the scale, over half of people with three or more vulnerabilities who live with other people share their housing with others who have three or more vulnerabilities.

This correlation is, of course, partly definitional and predictable. Everyone in a single-parent household, by our definition, has that vulnerability. Poverty and racial/ethnic identity also often apply either logically, culturally, or by definition to most or all people in the same household. Because of the correspondence of family arrangements and household structure, most people in poverty (57 percent) lived in households composed entirely of people below poverty. Another 27 percent lived by themselves, and 16 percent shared housing with at least one non-poor individual. Household homogeneity is very strong for black non-Hispanics, 94 percent of whom lived in all-black households in 2005-07. About 84 percent of Hispanics shared their housing only with other Hispanics.

Vulnerable people and precarious housing conditions: Correlations and regression results

On most of our measures, vulnerable people live in precarious housing conditions more commonly than those without these vulnerabilities. Here, we report the extent to which vulnerable people live in unaffordable, crowded, rental, and older housing, as well as the sorting of vulnerable people into various dwelling-unit types. Additionally, we use logit regressions to identify how these vulnerabilities act individually to shape housing outcomes. We hold constant the individual's age, sex, household income, and super-region; separate regressions identify how each vulnerability contributes individually to housing outcomes as well as the housing outcomes associated with increasing numbers of vulnerabilities.

According to federal **affordable housing** standards, people should pay no more than 30 percent of their incomes on housing; we use a more conservative 35 percent standard. In 2005-07, 28.1 percent of the household population in the 84 metros had unaffordable housing (Table 2). Nearly two-fifths (39.4 percent) of people living in rental housing in 2005-07 had unaffordable housing; overpayment stood at 23.3 percent for those in owner-occupied housing.¹

Insert Table 2 about here

Vulnerability associates strongly with unaffordable housing, except for recent military veterans and those over 75. In 2005-07, over three-quarters of people in poverty paid over 35 percent of their incomes for housing. About two-fifths of people in single-parent households, Hispanics, recent immigrants, blacks (African Americans), and non-high school graduates had unaffordable housing. On average, people over 75 years old have the same rates of overpayment as those under 75. Nationally, only 19 percent of recent veterans had unaffordable housing, a rate just two-thirds that of non-veterans.

In 2005-07, an estimated 7.7 percent of the residents of these 84 metros lived in dwellings with more than one person per room, the federal standard for **overcrowded** units. Eight of the 11 aspects of vulnerability associated in 2005-07 with higher than average rates of crowding; the exceptions are being 75 or over, a recent veteran, or disabled. Especially high rates of crowding afflict Hispanics and recent immigrants. Almost a fifth (19 percent) of people in poverty live in overcrowded housing. Sixteen percent of non-high school graduates lived in overcrowded housing. Fourteen percent of children live in overcrowded housing. About 11 percent of American Indians live in crowded housing. Overcrowding is also elevated among blacks (African Americans), about 8.3 percent of whom have more than one person per room, but their crowding varies across regions.

People with most of these vulnerabilities are more likely to **rent** than those without them. Across the whole population, 31.9 percent of people in these 84 metro areas lived in rental housing in 2005-07. All the vulnerabilities we examined associate with elevated levels of renting except being 75 years old or over; fewer than a quarter of seniors rent. Almost 70 percent of people in poverty lived in rental housing in 2005-07, as did almost 57 percent of post-1990 immigrants. About half of blacks, people in single-parent households, and Hispanics live in rental housing.

About 45 percent of people in 2005-07 lived in **structures built before 1970**. Seven of our 11 personal vulnerabilities associated with higher levels of living in older housing; between half and 56 percent of those 75 or over, non-high school graduates, blacks, people with disabilities, people in poverty, and people in single-parent households lived in housing built before 1970. Children, American Indians, and recent veterans were less likely than average to live in older housing. Although structure ages vary

¹ Renter estimates include mobile homes; owner-occupied estimates omit mobile homes.

across regions, most of these relationships held true across regions; the most important exception to this rule is recent immigrants.²

Among our vulnerable groups, only children do not live disproportionately in *dwelling other than single-family units*. About 65 percent of people in these metro areas live in single-family detached units. By contrast, only about two-fifths of post-1990 immigrants and those below poverty lived in single-family units; about a quarter of people in each of these two categories lived in small and medium-sized apartment buildings (5-49 dwellings, respectively), compared with only 12 percent of everyone in these metro areas. Between half and 55 percent of black non-Hispanic, Hispanic, non-high school graduates, and people in single-parent households lived in single-family detached housing in 2005-07. Disabled people and especially older seniors sort differently across structure types than other people. First, about 9 percent of seniors and 7 percent of those with at least one disability live in group quarters, compared with fewer than 2 percent of others. Of the household population constituting the remainder, about 10 percent of older seniors live in large structures (50 or more units), and almost 5 percent live in mobile homes or trailers. About 7 percent of people with at least one disability live in large structures, and 6 percent live in mobile homes or trailers. It may be that these circumstances represent opposite ends of the continuum of precarious housing; large structures are more institutional and often offer both ancillary support services and security staff to protect the health and safety of their residents. People living in mobile homes do not have those protections, but since many mobile-home residents live in parks (especially in metro areas), they often have access to community resources from neighbors. For both seniors and the disabled, it may be more difficult to live alone in an older single-family house in a neighborhood undergoing transitions than in a rental multi-family unit.

All these precarious housing conditions become more common as the number of personal vulnerabilities increases. Over one-fifth of people with three or more vulnerabilities (of whom there are over 30 million in these 84 metro areas) live in an overcrowded housing unit, a rate 15 times higher than that for people with no vulnerabilities. More than half of these most vulnerable people also live in unaffordable housing (54%), rental housing (63%), pre-1970 housing (54%), or attached housing and mobile homes (57%).

Our binary logit regressions identify the independent relationship between each vulnerability and housing outcomes in 2005-07. The dependent variables in the regressions are tenure (propensity to rent), affordability (propensity to pay more than 35 percent of income on housing costs), overcrowding (propensity of living in a unit with more than one person per room), living in old (pre-1970) housing, and living in attached housing or mobile homes. Since tenure may change the relationship between personal vulnerabilities and exposure to other precarious housing conditions, we conducted separate regressions for renters and owners for the other four precarious conditions. We treat each vulnerability as a categorical independent variable, except that age and household income are continuous instead of categorical vulnerabilities (children, older seniors, and people below poverty). Additionally, since the influence of age changes over the life course and since the impacts of income may not be linear, we

² Recent immigrants in the South and Northwest are less likely than non-recent immigrants to live in old housing. But immigrants in the most populous regions (Greater Los Angeles, Norfolk-Boston, Great Lakes, and Florida) are more likely than other people to live in old housing, and the number of both immigrants and old units is large in these three regions.

included quadratic terms of both in the model. To account for the impact of additional vulnerabilities within the same household, we included the average number of vulnerabilities of other household members. Sex and number of persons in the household are also included as control variables. We control for broader housing-market conditions by including 15 broad regional locations as fixed effects in the model; we do not report on these fixed effects, though in all cases the signs and magnitudes were consistent with our expectations. With such a large number of cases, all our explanatory variables were statistically significant. In the regressions predicting homeowners' precarious housing situations, however, the modeling required that we drop the age-squared term and combine two of the housing regions to yield results.

Income has significant negative relationships with all precarious housing conditions (Table 3). That is, as household income rises, an individual becomes less likely to rent, overpay, overcrowd, live in old housing, or live in attached housing. We will illustrate further in the simulations below that income (unsurprisingly) has the biggest impact on the probability of practically every precarious housing outcome, underscoring the longstanding contention that income support is among our best housing policies.

Insert Table 3 about here.

Age has significant quadratic relationships with all precarious housing conditions. The propensity to rent, overpay, or overcrowd increases with age, but this impact diminishes over time. The propensity to overcrowd and to live in single-family housing declines with age, but this, too, slows over time.

All of the other vulnerabilities raised the probability of renting (Table 2). Renting, in turn, associates independently with higher odds of overcrowding, living in old housing, and living in attached housing; on the other hand, holding income constant, home owners are over twice as likely to pay more than 35 percent of their income on housing as are renters.³

Immigrants, Hispanics, and people with **less than a high-school** education have higher likelihoods of living in precarious housing after tenure is accounted for (Figure 3). Immigrant renters are twice as likely to overcrowd and to live in non-single family housing as non-immigrant renters, all else being equal. Immigrant home owners are over 1.5 times more likely to pay over 35 percent of income for their housing than others. Immigrant owners also are 1.6 times more likely to overcrowd and 1.8 times more likely to live in attached or mobile homes than other home owners. Independent of whether or not they are recent immigrants, Hispanic renters and owners alike have higher odds of overcrowding, living in old housing, and living in attached housing than non-Hispanics. Those with less than a high-school education also have elevated risk of overcrowding and living in old housing. **American Indians** also have somewhat elevated risk of all three of these remaining precarious conditions (all, that is, except overpayment).

Insert Figure 3 about here.

³ This unexpected result suggests that households make tenure decisions first based on their income, but that when low income households decide to buy a house they are extremely likely to pay more than 35 percent of their incomes to do so, at least in 2005-07.

Black non-Hispanics are only about 75 percent as likely as others to live in crowded housing, net of household size and income; blacks are, however, more likely to live in old and attached housing, with black owners much more likely to live in old housing and black renters much more likely to live in attached housing than others. People in **single parent households**, like black non-Hispanics, are less likely than others to overpay or overcrowd; those who own homes are somewhat more likely to live in attached and older housing units than are those in other household types. **Recent veterans** and people with at least one **disability** have lower odds than others to live in precarious housing; both of these statuses depress the odds of overpaying and overcrowding at least a little, but those with disabilities are slightly more likely than others to live in old housing.

To help visualize the corollaries of personal vulnerabilities in housing markets, we estimate the probability that each of five hypothetical people will experience a particular housing outcome. All five live in a metropolitan area in the South Central region. Jim, Frank, and Larry are all 37-year-old high-school graduates; all are married with one child. Jim and Frank are white non-Hispanic, and Larry is black non-Hispanic. Jim and Larry both have household incomes of \$40,000 per year; Frank's household income is \$12,000. Jim's household has one child and no other vulnerabilities; Frank's and Larry's households both have three vulnerabilities in addition to Frank's and Larry's one. Janet is a 28-year-old Haitian immigrant and Maria is a 78-year-old Mexican immigrant. Neither has a high-school diploma; both rent their housing. Both immigrated to the U.S. since 1990. Janet earns \$15,000 per year and is the single parent of two children. Maria earns \$6000 per year and lives alone.

Income differences have a very large effect on housing outcomes (Figure 4). Frank, who resembles Jim in all respects but two (income and vulnerability of other household members), is 20 percentage points more likely to rent than Jim and 30 percentage points more likely to overpay. The income difference has a much more modest impact on living in old or attached housing, four and three percentage points, respectively. Larry also resembles Jim in all respects but two (race and vulnerability of other household members); because Larry is African American, he has a 43 percent probability of renting, compared with 26 percent for Jim. He is also nearly 10 percentage points more likely to live in old housing than Jim.

Insert Figure 4 about here.

Janet and Maria have multiple vulnerabilities; both of them rent, though statistically speaking Maria has only a 27 percent probability of renting (owing to her advanced age). Renting raises their odds of experiencing any of the other precarious housing conditions. If Janet were a homeowner, her odds of overcrowding and living in attached housing would decline significantly. Her odds of overpayment would not change, however, and her odds of living in old housing would increase by nine percentage points. (Janet is the only one of these hypothetical people with appreciable odds of overcrowding—about a 20 percent probability—because she is a low-income young immigrant renter with children.) Maria, by contrast, would have a much lower probability of both overpayment and living in attached housing if she owned her home. This is not to say, of course, that changing these renters into home owners would somehow automatically reduce their exposure to other precarious conditions. Many complex factors are not modeled here and undoubtedly shape housing outcomes.

Discussion: Vulnerability, precariousness, and regional resilience

Today's political, social, and economic environment hinders a concerted response to concentrated vulnerability at either the personal, the household, or the neighborhood level. Our responses often focus on a single vulnerability (e.g., disability or the lack of a high-school diploma) while ignoring other challenges within the same person or household. Some vulnerabilities, especially those related to race, ethnicity, and citizenship status, have become flashpoints and for many Americans both in institutions (government, business, and civil society alike) and as individuals. Still others—advanced old age, in particular—have not fully entered our consciousness as growing challenges. American politics, society, and economic conditions will undoubtedly change as the baby boom enters retirement and second- and third-generation immigrants come of age; once those changes set in, it may become more acceptable, if not routine, to deal directly with these vulnerabilities.

The precarious housing situations we explore in this research, by contrast, are widely accepted concerns for public policy, civil society, and business. We therefore suspect that continued efforts to anticipate, guard against, and mitigate precarious housing situations may be both more tractable and more durable than efforts to address some of personal and household vulnerabilities more directly. Returning to Figure 1, such efforts would “shrink the box” of precarious situations so that fewer vulnerable people ended up there. Longer-term efforts might also shrink the box of turbulent environments, if, for example, they can help avoid future financial collapses like those of the 2000s or epidemics of violence like those in many central cities in the 1980s and early 1990s.

Reducing precariousness in housing is especially important in light of our findings about the “piling-on” of selected vulnerabilities. A few vulnerabilities strongly correlate with others; about a third of those in poverty, in particular, have three or more other vulnerabilities, and nearly another quarter have two others. Non-high school graduates, Hispanics, recent immigrants, and people in single-parent households also have a high incidence of other vulnerabilities that may reduce their resilience in the face of stresses on themselves, their households, or their broader environments. The most vulnerable immigrants—the undocumented, who are undercounted by the Census and probably underestimated in the ACS—experience poverty and have even lower rates of high-school completion than the legal immigrants who are better represented by official counts.

Some characteristics we examined, however, do not correlate with other vulnerabilities. Over half of post-1990 veterans have none of the other vulnerabilities, and only 15 percent had three or more. Their rates of poverty, disability, and living in single-parent households were much lower than those of the total population, and their high-school completion rate was almost 100 percent. It is possible that the most vulnerable recent veterans do not live in households but rather are either homeless or institutionalized. Children, unlike veterans, are inherently vulnerable, though over two-fifths of children have none of the other vulnerabilities we explored. Children have higher rates of poverty than the national average, and over 30 percent live in one-parent households. Recent research by the Urban Institute shows that most children who are born into poverty stay poor for most of their lives, a statistic that only underscores the urgency to society of redoubling our efforts to improve living standards and options for low-income families (Ratcliffe and McKernan 2010).

Over three-quarters of people in these 84 metros share their housing. Whether or not a person has one of the vulnerabilities we examined, she has the potential to bear a greater burden if she shares housing with children, elders, disabled people, recent immigrants, or people subjected to discrimination because of their skin color or ethnicity. In fact, most of those living with vulnerable people have vulnerabilities of their own.

While the measures of precarious housing we used cannot capture the full range of conditions that can cause instability in housing in the face of environmental strains or shocks, we find substantial confirmation for our assumption that many personal vulnerabilities correlate with precarious housing situations. People with these vulnerabilities are more likely than the average person to live in housing that has at least two of the five precarious conditions we explored. Six of the vulnerabilities—lacking a high-school diploma, living below poverty or in a single parent household, or being black non-Hispanic, Hispanic, or a recent immigrant—correlate with above-average levels of living in all five of the precarious situations. Seniors, children, and recent veterans appear as groups to be relatively less exposed to these precarious conditions.

Holding these conditions constant, we find that income matters more than any other single factor in Americans' ability to avoid precarious housing, but that race—particularly being African American—and nativity still have important independent relationships with living in precarious housing. While native-born Hispanics are less likely to live in precarious housing situations than native-born African Americans, recent Hispanic immigrants are more likely than otherwise similar native-born African Americans to rent. If they do own their houses, Hispanic immigrants also are more likely than otherwise similar native-born African Americans to overpay, overcrowd, and live in non-single family detached dwellings, even when they earn as much as \$40,000 per year.

Our findings about overcrowding merit further comment and reveal the complexity of the relationship between personal vulnerability and precarious housing situations. In the 1990s, many immigrant and Hispanic families had crowded in extended-family households, saving for a down payment and establishing themselves in the labor force. In the 2000s, mortgages became easier and cheaper to obtain, and many subfamilies formed their own households (Ong and Ong 2009). When they did so, however, affordability declined both for themselves (because previously shared housing costs became entirely their own responsibility and their gross household income dropped simultaneously) and for their "origin" households (which now had less income to pay for housing). In short, "cheap" mortgages often created two highly precarious housing situations (two households overpaying) out of one ambiguously precarious situation (one crowded household). Since the housing crash, vacancy rates have increased or held steady—even in rental housing, which some observers expected would accommodate many former home owners—while housing prices have declined. This suggests that many households have responded to the shock by re-combining (Painter 2010).

With the ability to relate potential housing challenges to vulnerabilities that we can forecast, policy makers have the ability to gauge with reasonable accuracy the nature, magnitude, and geography of areas of future housing concern. The findings confirm, for example, that African American households are disproportionately likely—even holding constant their incomes—to live in older housing units,

meaning that the wealth-building potential of home ownership needs to be balanced against the costs of living in old houses. Sometimes these costs come suddenly, as when an old roof or boiler needs replacement. At other times, the costs are borne over time and experienced only indirectly, as when household air quality deteriorates or lead paint threatens child development. Immigrants, by contrast, experience overcrowded housing and—since recent immigrants often share the same communities and neighborhoods—therefore place comparatively high demands on public infrastructure.

The findings also confirm, however, that some populations—military veterans and the “old old,” for example—are for the most part relatively well housed. People over 75 do live at statistically high rates in older housing, multi-family units, and mobile homes, but such situations may often be sensible for them and even protect them from some risks. Children, for another example, are statistically more likely than adults to live in overcrowded housing, but sharing rooms with several siblings probably ranks fairly low in the range of long-term threats to mental health, and it may even build resilience and adaptability.

Many of the precarious housing situations we examined here are significant not only for their occupants but also for their cities and regions. Efforts to reduce the potential impacts of precarious housing and turbulent environments upon vulnerable people will require at least some responses that are regional. Historically, the most seriously precarious housing conditions have occurred in central cities, obscuring their importance in regional markets. By now, however, overcrowding, old housing, overpayment, renting, and non-single family housing appear in many jurisdictions in most metropolitan areas (Kneebone and Garr 2010), though concentrated poverty is still mostly an urban phenomenon. Regions that anticipate the many challenges of protecting and improving this housing stock will do much to guard against stresses that will affect our most vulnerable residents and thereby exhibit greater resilience.

The federal government can do much to help metropolitan areas become more resilient in the face of precarious housing conditions. Federal programs have recognized this for many years. The 1990 Cranston-Gonzalez Act, in creating the HOME block grants, provided a new incentive for consortia of localities to collaborate on affordable housing. Under the current administration, HUD seeks to improve connections between housing policy and transportation policy, recasting the achievement of excellent and affordable “H+T” bundles as a goal that can meet the needs of vulnerable people more effectively than can affordable housing alone. Considering the needs for both public transit and affordable housing among many of the vulnerable populations we consider here, especially the “old old,” people in poverty, and the disabled, such a move would provide important new protections. And since transportation planning already occurs in a regional context, a move encouraging metropolitan areas to square their transportation and housing goals has the potential to improve regional resilience where housing is concerned.

Since every federal housing program offers substantial flexibility and respects local decision-making, state and local decision-makers continue to matter in the development of regional resilience in the face of housing stresses. Metropolitan areas have widely differing challenges, with some facing high levels of crowding and overpayment and others struggling with high vacancy rates and abandonment in older housing. Furthermore, capacity varies among local governments. Sometimes local governments have

the capacity to deal with precarious housing by themselves; other local governments—especially the smaller suburbs and exurbs where precarious housing will emerge as a new issue—do not. Often even capable governments have too few incentives or resources to collaborate with their neighbors. State government already plays some role in addressing precarious housing conditions; every state administers bond programs and low-income tax credit allocations, and some states require or encourage local and regional housing planning. Regions in states with active, responsive, and appropriate housing policies will likely have greater capacity, develop better mechanisms for forecasting and scenario-building, and meet their housing challenges earlier and more comprehensively. With these elements—capacity, foresight, early action, and comprehensive responses—regions are, in turn, much more likely to reduce the worst impacts of stresses on their most vulnerable residents.

While HUD's new Office of Sustainable Communities focuses appropriately on the metropolitan level as the locus of the "H+T" equation, therefore, the state level should not at all be forgotten as one level at which responses can emerge. Federal incentives that encourage states to plan more seriously for metropolitan housing markets, for example, would create new knowledge and relationships and energize new constituencies that could overcome inertia and build preparedness. Even if they contain no requirements for "fair share" approaches or other clear threats to suburban autonomy, this encouragement of foresight and knowledge-generation would build resilience. Ultimately, the relationships and knowledge built from the process of housing planning may even yield a broader recognition of the truly metropolitan nature of housing needs, with consequent new willingness to deal with precarious housing by previously unconcerned or hostile mayors and city councils.

Conclusion

By beginning from the level of individuals and households, we have built the groundwork for a more robust approach toward concentrated disadvantage. Whereas most urban and housing policy analysis considers mainly concentration of poverty and racial segregation at the neighborhood level, we have established that some vulnerabilities concentrate within individuals and particular households. We also establish that some vulnerabilities predispose individuals toward living in a variety of precarious housing situations. Some of this concentration is a consequence of income difference; some results from other personal and household characteristics, including race and nativity, that still hinder people's attainment of equal housing opportunity.

Further research is needed to understand how concentrated disadvantage relates to decisions both past and present about housing and neighborhoods. Today's suitable dwelling may become tomorrow's white elephant; today's desirable neighborhood may be tomorrow's pocket of poverty. By understanding the long history of housing, neighborhoods, and concentrated disadvantage, we may be better prepared to respond to future challenges in broader national and metropolitan environments. As that understanding grows, furthermore, it can become a guide to action if the institutional context is appropriate, thereby enhancing resilience for new generations of metropolitan residents.

Appendix A: Metro areas included, sorted by 15 geographic areas

- Florida peninsula: Daytona Beach, FL; Fort Lauderdale-Hollywood-Pompano Beach, FL; Fort Myers-Cape Coral, FL; Jacksonville, FL; Lakeland-Winterhaven, FL; Melbourne-Titusville-Cocoa-Palm Bay, FL; Miami-Hialeah, FL; Orlando, FL; Punta Gorda, FL; Sarasota, FL; Tampa-St. Petersburg-Clearwater, FL; West Palm Beach-Boca Raton-Delray Beach, FL
- Mid-Gulf: Baton Rouge, LA; Mobile, AL; New Orleans, LA; Pensacola, FL
- South Central: Austin, TX; Dallas-Fort Worth, TX; Galveston-Texas City, TX; Houston-Brazoria, TX; Little Rock--North Little Rock, AR; Memphis, TN/AR/MS; Oklahoma City, OK; San Antonio, TX; Sherman-Davidson, TX; Tulsa, OK
- Four Corners: Albuquerque, NM; Colorado Springs, CO; Denver-Boulder, CO; El Paso, TX; Fort Collins-Loveland, CO; Greeley, CO; Phoenix, AZ; Provo-Orem, UT; Salt Lake City-Ogden, UT; Tucson, AZ
- Greater LA: Las Vegas, NV; Los Angeles-Long Beach, CA; Riverside-San Bernardino, CA; San Diego, CA; Ventura-Oxnard-Simi Valley, CA
- Central Valley: Bakersfield, CA; Fresno, CA; Sacramento, CA; Stockton, CA
- SF Bay Area: San Francisco-Oakland-Vallejo, CA; San Jose, CA; Santa Cruz, CA; Santa Rosa-Petaluma, CA
- Pacific NW: Portland, OR-WA; Salem, OR; Seattle-Everett, WA; Tacoma, WA
- Plains: Kansas City, MO-KS; Lawrence, KS; Minneapolis-St. Paul, MN; Omaha, NE/IA; St. Louis, MO-IL; Wichita, KS
- Great Lakes: Akron, OH; Ann Arbor, MI; Canton, OH; Chicago, IL; Cleveland, OH; Detroit, MI; Fort Wayne, IN; Grand Rapids, MI; Kankakee, IL; Kenosha, WI; Milwaukee, WI; Racine, WI; Toledo, OH/MI; Youngstown-Warren, OH-PA
- Mid-Ohio: Cincinnati-Hamilton, OH/KY/IN; Columbus, OH; Dayton-Springfield, OH; Hamilton-Middleton, OH; Indianapolis, IN; Louisville, KY/IN
- Upstate NY-PA: Albany-Schenectady-Troy, NY; Allentown-Bethlehem-Easton, PA/NJ; Binghamton, NY; Buffalo-Niagara Falls, NY; Elmira, NY; Glens Falls, NY; Harrisburg-Lebanon--Carlisle, PA; Jamestown-Dunkirk, NY; Pittsburgh, PA; Rochester, NY; Scranton-Wilkes-Barre, PA; Syracuse, NY; Utica-Rome, NY
- Norfolk-Boston: Atlantic City, NJ; Baltimore, MD; Boston, MA-NH; Bridgeport, CT; Brockton, MA; Danbury, CT; Dutchess Co., NY; Fitchburg-Leominster, MA; Hartford-Bristol-Middleton- New Britain, CT; Manchester, NH; Monmouth-Ocean, NJ; Nashua, NH; New Haven-Meriden, CT; New York-Northeastern NJ; Newburgh-Middletown, NY; Norfolk-VA Beach--Newport News, VA; Philadelphia, PA/NJ; Portsmouth-Dover--Rochester, NH/ME; Providence-Fall River-Pawtucket, MA/RI; Richmond-Petersburg, VA; Springfield-Holyoke-Chicopee, MA; Stamford, CT; Trenton, NJ; Vineland-Milville-Bridgetown, NJ; Washington, DC/MD/VA; Waterbury, CT; Wilmington, DE/NJ/MD; Worcester, MA
- Southeast: Atlanta, GA; Birmingham, AL; Charleston-N. Charleston, SC; Charlotte-Gastonia-Rock Hill, NC-SC; Columbia, SC; Greensboro-Winston Salem-High Point, NC; Greenville-Spartanburg-Anderson SC; Knoxville, TN; Nashville, TN; Raleigh-Durham, NC
- Honolulu: Honolulu, HI

Note: Since we used 2000 PUMA boundaries to acquire data, some CBSAs are overbounded and some underbounded by our data. For a map of the areas we used or a list of the PUMAs, please contact the lead author.

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Table 1. Incidence of vulnerability, 84 U.S. metro areas, 2000 and 2005-07

	Persons	Percent of persons
Total	198,455,671	100.0%
<i>Number of vulnerabilities</i>		
None	59,804,825	30.1%
1	63,702,549	32.1%
2	40,820,129	20.6%
3 or more	34,128,168	17.2%
<i>Personal vulnerabilities</i>		
Black, non-Hispanic	26,899,780	13.6%
Hispanic	34,967,263	17.6%
American Indian (non Hispanic)	740,602	0.4%
At least one disability	23,679,203	11.9%
Military veteran since 1990	3,203,563	1.6%
Post-1990 immigrant	18,768,325	9.5%
Not a high school graduate	21,152,198	10.7%
Single parent household	43,816,007	22.1%
Below poverty	27,578,369	13.9%
Under 18	49,613,487	25.0%
75 or over	10,410,210	5.2%

Source: American Community Survey, 2005-07, microdata, extracted using IPUMS (Steven Ruggles, J. Trent Alexander, Katie Genadek, Ronald Goeken, Matthew B. Schroeder, and Matthew Sobek. Integrated Public Use Microdata Series: Version 5.0 [Machine-readable database]. Minneapolis: University of Minnesota, 2010).

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Table 2. Vulnerability and Precarious Housing, 2005-07

Vulnerability	Persons	Percent with precarious housing:				
		Unafford- able	Crowded	Rented	Pre- 1970	Non- SFDU
Black non-Hispanic	26,005,400	39.0%	8.3%	51.5%	53.0%	49.1%
Hispanic	34,443,698	39.8	23.4	48.9	49.2	47.0
American Indian (non Hispanic)	708,202	29.9	11.0	42.8	39.6	38.2
At least one disability	21,770,521	35.0	4.2	34.8	52.0	40.9
Post-1990 veteran	2,968,157	19.3	2.8	37.8	30.8	37.0
Post-1990 immigrant	18,525,545	39.2	23.1	56.9	45.0	58.9
Less than HS education	20,073,312	38.0	15.7	46.4	55.9	47.7
Single parent household	43,871,860	40.6	11.1	51.1	51.6	48.0
Below poverty	23,415,886	76.5	19.2	69.4	52.6	60.5
Under 18	49,497,367	34.7	13.9	34.6	41.9	31.5
75 or over	9,543,270	28.1	1.2	22.5	55.7	38.7
Number of vulnerabilities						
None	59,706,820	1.3	15.0	17.3	39.9	23.9
One	62,461,626	4.6	23.1	24.7	41.8	29.1
Two	39,445,429	11.5	34.7	39.7	48.0	41.6
Three or more	32,208,284	20.7	54.4	63.0	54.3	57.0
Average (all people)	193,982,450	28.1%	7.7%	31.9%	44.6%	34.7%

Source: U.S. Census Bureau, 2005-07 American Community Survey, microdata, authors' calculations from 84 metropolitan areas.

Vulnerable People, Precarious Housing, and Regional Resilience

Table 3. Regression results: Vulnerability and precarious housing, 2005-07

<i>Coefficients</i>	Overpay		Overcrowd		Old housing		Non-SFDU		
	Rent	Owners	Renters	Owners	Renters	Owners	Renters	Owners	Renters
Black non-Hispanic	0.4158	0.0381	-0.2144	-0.3472	-0.2602	0.3659	0.1669	0.0306	0.1769
Hispanic	0.0790	-0.0484	-0.3305	0.2696	0.2934	0.3646	0.2885	0.1681	0.3290
American Indian	0.3544	-0.4033	-0.3231	0.2075	0.4333	0.1048	0.0523	0.1923	0.0741
At least one disability	0.1253	-0.1145	-0.0854	-0.0346	-0.2185	0.1505	0.0569	0.0887	-0.1114
Post 1990 veteran	0.4779	0.0190	-0.0554	-0.1339	-0.4653	-0.4975	-0.5730	-0.0648	0.1442
Post 1990 immigrant	0.7732	0.5398	0.0561	0.4642	0.7377	-0.3411	-0.1923	0.6117	0.8146
Less than HS education	0.3285	-0.1874	-0.3070	0.3704	0.2190	0.2614	0.1811	0.2118	0.0056
Single parent household	0.1179	-0.1668	-0.0173	-0.3865	-0.6016	0.2335	0.0210	0.1687	-0.1632
Vulnerability of others in household	0.3747	0.1070	-0.0383	0.4619	0.3517	0.0842	0.0482	0.2012	0.1428
Household size	-0.1760	0.0986	0.1886	1.2885	1.1086	0.0363	0.0741	-0.1797	-0.3467
Male	0.0406	-0.0262	-0.0195	0.0321	0.0291	0.0348	0.0685	0.0177	-0.0408
Age (decades)	0.0072	-0.1466	0.0833	-0.0498	-0.2530	0.0777	0.1121	-0.0095	-0.1288
Age (decades), squared	-0.0005		-0.0130		0.0288		-0.0082		0.0083
Household income (\$000)	-0.0188	-0.4030	-1.0139	-0.0977	-0.0586	-0.0473	-0.0297	-0.0620	-0.0478
Household income (\$000) squared	1.81E-05	2.92E-05	4.70E-05	6.10E-06	4.44E-06	5.72E-06	4.00E-06	6.44E-06	5.59E-06
Constant	1.6174	0.9141	3.5019	-9.5501	-5.8584	-1.5787	-0.5546	-1.3584	2.4527
<i>Odds ratios</i>									
Black non-Hispanic	1.516	1.039	0.807	0.707	0.771	1.442	1.182	1.031	1.193
Hispanic	1.082	0.953	0.719	1.309	1.341	1.440	1.334	1.183	1.390
American Indian	1.425	0.668	0.724	1.231	1.542	1.111	1.054	1.212	1.077
At least one disability	1.134	0.892	0.918	0.966	0.804	1.162	1.059	1.093	0.895
Post 1990 veteran	1.613	1.019	0.946	0.875	0.628	0.608	0.564	0.937	1.155
Post 1990 immigrant	2.167	1.716	1.058	1.591	2.091	0.711	0.825	1.844	2.258
Less than HS education	1.389	0.829	0.736	1.448	1.245	1.299	1.199	1.236	1.006
Single parent household	1.125	0.846	0.983	0.679	0.548	1.263	1.021	1.184	0.849
Vulnerability of others in household	1.454	1.113	0.962	1.587	1.422	1.088	1.049	1.223	1.154
Household size	0.839	1.104	1.208	3.627	3.030	1.037	1.077	0.836	0.707
Male	1.041	0.974	0.981	1.033	1.030	1.035	1.071	1.018	0.960
Age (decades)	1.007	0.864	1.087	0.951	0.776	1.081	1.119	0.991	0.879
Age (decades), squared	1.000	1.000	0.987		1.029		0.992		1.008
Household income (\$000)	0.981	0.668	0.363	0.907	0.943	0.954	0.971	0.940	0.953
Household income (\$000) squared	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Number of observations (unweightec	4,857,270	3,714,091	1,143,179	3,714,091	1,143,179	3,714,091	1,143,179	3,657,801	1,134,746
All coefficients significant at less than 0.001% confidence level.									
Percent of observed correctly predicted									
Without vulnerability	90.2	94.7	86.5	99.2	96.2	76.5	65.5	99.6	22.1
With vulnerability	50.9	42.5	80.1	47.3	54.3	50.2	65.8	2.6	94.4
Total	78.4	83.4	84.1	96.8	88.8	65.5	65.7	85.5	73.5

Regional fixed effects omitted.

Figure 1. The Intersection between Vulnerable, Precarious, and Turbulent Environments

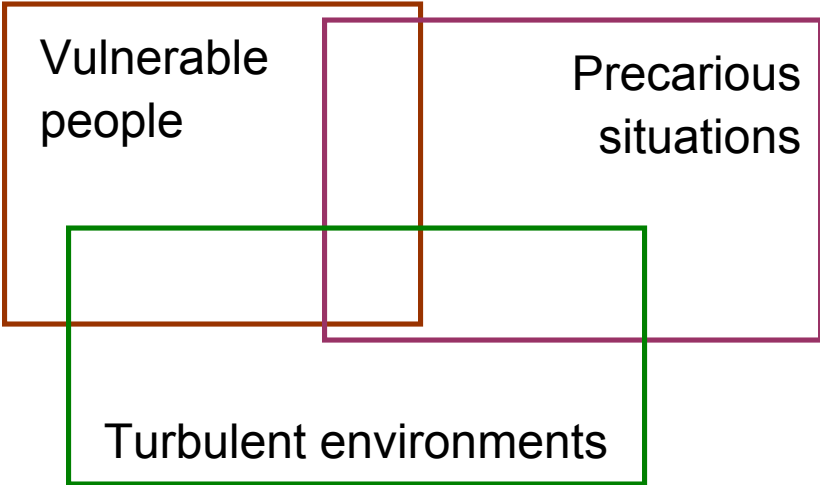
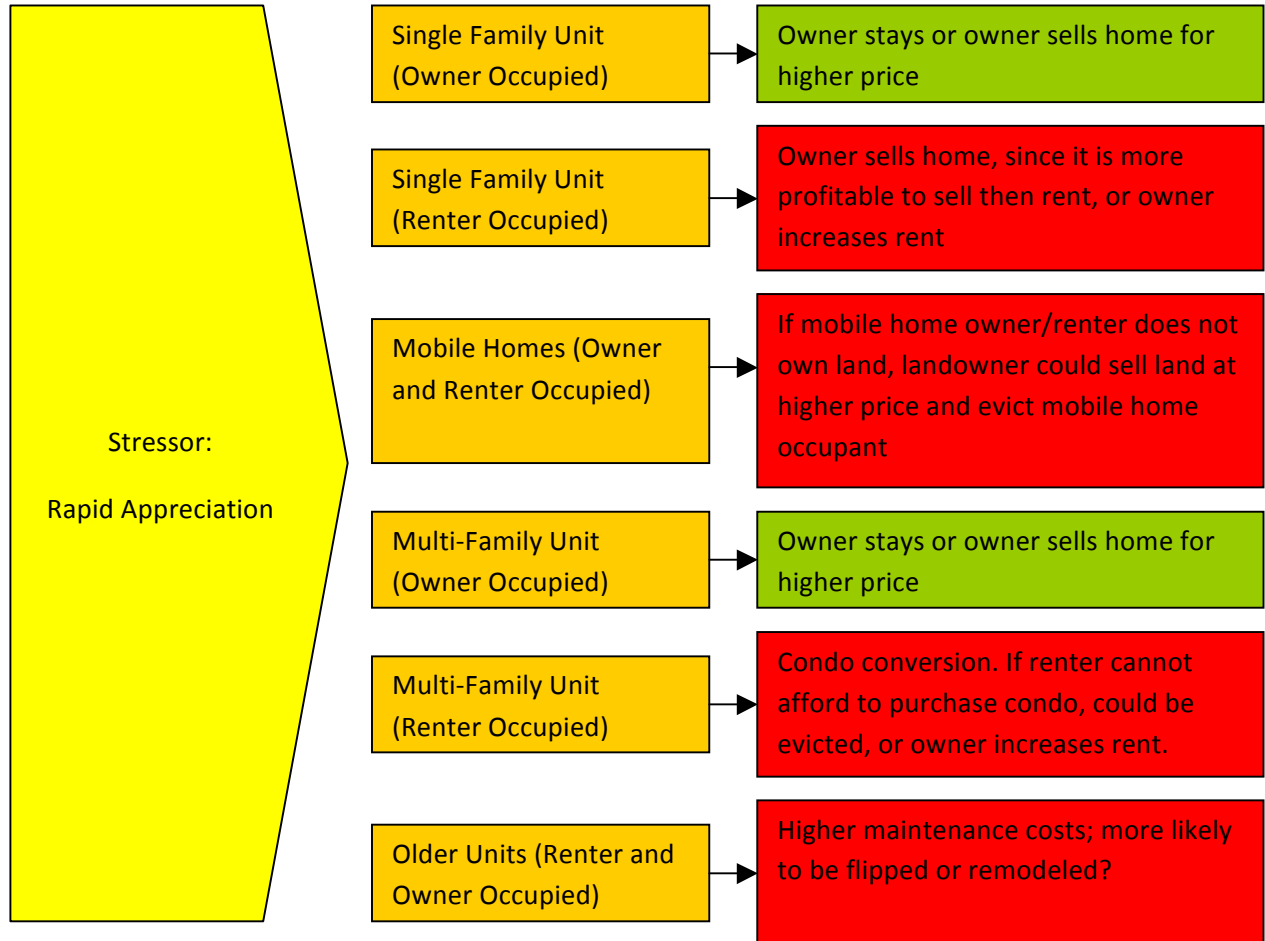


Figure 2: Theorized Effects of Rapid Appreciation by Housing Stock and Tenure



Vulnerable People, Precarious Housing, and Regional Resilience

Figure 3. Independent odds of experiencing precarious housing in the presence of specified vulnerabilities, renters and owners, 2005-07

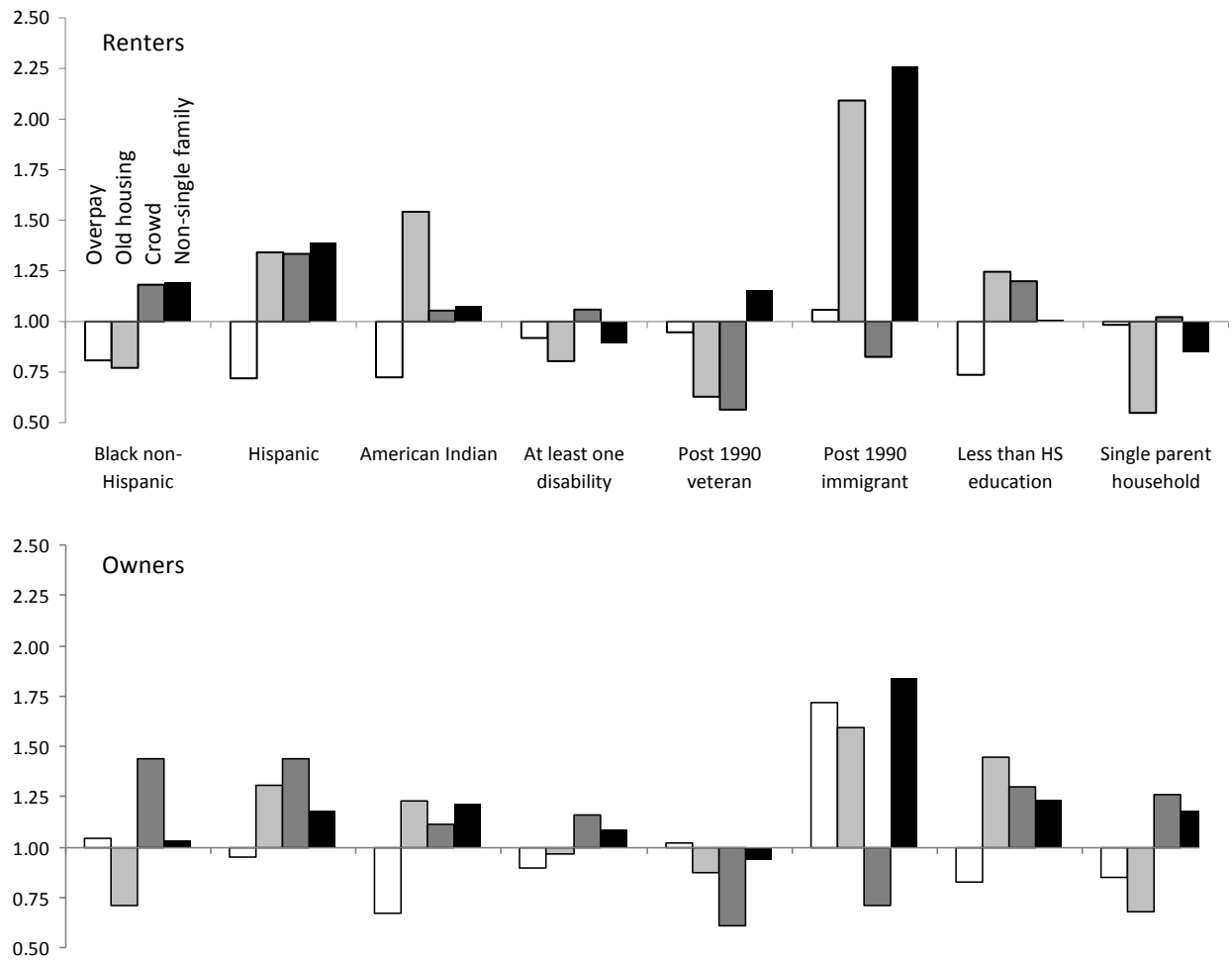


Figure 4. Odds of experiencing precarious housing, hypothetical persons, 2005-07

