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# Housing hardship and energy insecurity among native-born and immigrant low-income families with children in the United States

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## Abstract

The costs for rent and utilities account for the largest share of living expenses, yet these two critical dimensions of material hardship have seldom been examined concurrently in population-based studies. This paper employs multivariate statistical analysis using American Community Survey data to demonstrate the relative risk ratio of low-income renter-occupied households with children experiencing "rent burden," "energy insecurity," or a "double burden" as opposed to no burden. Findings suggest that low-income households are more likely to experience these economic hardships in general but that specific groups are disproportionately burdened in different ways. For instance, whereas immigrants are more likely to experience rental burden, they are less likely to experience energy insecurity and are also spared from the double burden. In contrast, native-born African Americans are more likely than all other groups to experience the double burden. These results may be driven by the housing stock available to certain groups due to racial residential segregation, decisions regarding the quality of housing low-income householders are able to afford, as well as home-country values, such as modest living and energy conservation practices, among immigrant families. This paper also points to important policy gaps in safety net benefits related to housing and energy targeting low-income households.

### Keywords

rental burden; energy insecurity; double burden; material hardship; immigrant groups; vulnerable populations; housing and health

## Introduction

The Great Recession of the late 2000s jeopardized both household economic solvency and housing stability for millions of Americans (Pew Social Trust 2010). In the aftermath of these circumstances, new economic and housing realities have emerged. With the recession

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driven by a foreclosure crisis that was most pervasive among the economically vulnerable, home ownership has become increasingly difficult to achieve, resulting in an upsurge in rental markets for lower-income groups. A recent report indicates that as the demand for rental units has increased, the income of renters has stagnated or declined in the same time period (Joint Center for Housing Studies of Harvard University 2013). Notwithstanding this trend, the cost of housing—regardless of tenure status (as owner or renter)—is accompanied by hidden hardship related to household energy. Combined, rent and utility bills constitute the largest share of living expenses, yet "rent burden" and "energy insecurity" have seldom been examined concurrently in population-based studies. Based on data from the American Community Survey, this paper examines rent burden, energy insecurity, and their confluence. In this article, we argue that current metrics for calculating housing hardship are insufficient as they fail to account for related basic needs that place an undue burden on vulnerable populations.

Our understanding of the problem of rent burden, energy insecurity, and the double burden is rooted in the long-standing sociological literature on material hardships and coping strategies of the poor, the social determinants of health, and the protective factors of immigration (Markides and Coreil 1986; Scribner 1996). Earlier work on economic burdens of welfare recipients and the working poor acknowledged housing expenses as a main cost burden but did not fully account for utilities hardships (Edin and Lein 2008; Heflin 2011). Utilities expenses cover heating, cooling, lighting, cooking, and refrigeration, among other basic functions, and therefore constitute a key dimension of housing and an everyday necessity. Hence, comprehensive (and realistic) assessments of housing expenditures should account for energy expenditures. The under-acknowledgment of energy as a basic need has also translated into less support for energy assistance as compared with housing and other social benefits.

Two recent policy briefs published by the National Center for Children in Poverty (NCCP) examine rent burden and energy insecurity using national data sets. Rent burden, which disproportionately affects low-income families, is defined as spending more than 30% of household income on rent (Schwartz and Wilson 2008). The study finds that the proportion of households with children affected by rent burden has increased significantly in recent years (Aratani et al. 2011). The rent burden brief showed that in 2011, more than half of renter-occupied households with children (59%) and three-quarters of low-income renter-occupied households (74.5%) experienced rent burden. Key differences by race, ethnicity, and immigration status have also been identified elsewhere. For instance, a New York City–based study showed that non-native-born renters suffer disproportionately high levels of rent burden as compared with native non-Hispanic white renters (Schill et al. 1998). There is also evidence that immigration status may be a factor in rent burden, with undocumented immigrants being at greater risk than documented immigrants (McConnell 2013). These figures do not capture the added burden of relatively high utility costs in addition to the weight of housing costs.

A novel Household Energy Insecurity Scale (HEIS) examines the experience or threat of utilities shutoff and common stresses induced by household energy costs (Colton 2003) and recipients of the Low Income Home Energy Assistance Program (LIHEAP) benefits. Murray

and Mills analyzed HEIS results with data from the Residential Energy Consumption Survey (RECS). The authors captured not only fiscal burden, but the worry associated with energy costs (2012). Unfortunately, the data are specific to LIHEAP recipients and thus represents only a subset of the broader U.S. low-income population of interest in this paper.

Economic energy insecurity is defined in this study as spending greater than 10% of household income on utility expenses (Hernández 2014; Hernández et al. 2014). Using this definition, the NCCP energy insecurity brief demonstrated that over 80% of severely impoverished households experience energy insecurity, as do many others hovering around the poverty line. Certain racial/ethnic groups (i.e., African Americans and native born) were also disproportionately impacted by energy insecurity. The brief's authors found that renters, along with African American and native-born households, were more likely to allocate upwards of 10% of household income on utilities (Hernández et al. 2014).

While rent burden is well represented in the literature, energy insecurity remains less so. The factors involved in energy insecurity are complex, and the relationship between energy insecurity and the populations disproportionally affected by it is confounded by multiple variables. We believe that energy insecurity is most proximally determined by housing type, housing quality, and income/poverty status. It is generally accepted that multifamily homes and buildings are more energy efficient than single family dwellings (Brown and Wolfe 2007). The same can be said for attached versus detached homes (Hernandez et al. 2011). Housing quality or condition can adversely impact energy efficiency via structural problems, such as leaks or cracks and holes in walls and flooring, and less-expensive building materials, for example, single-paned versus double-paned glass, etc. (Hernández 2013). As demonstrated in the NCCP policy brief, poverty appears to be a significant risk factor. This is likely due to the simple fact that scarce resources among the poor must be stretched further to meet basic necessities (Heflin et al. 2011; Hernández 2014).

Simultaneously, there are numerous upstream variables that would theoretically increase or decrease one's susceptibility to energy insecurity via the proposed proximal factors. Residential segregation remains a pervasive societal issue, influencing the quality and location of housing inhabited by a given racial group (Williams and Collins 2001). But race also remains strongly correlated with household income (DeNavas-Walt and Bernadette 2013). Furthermore, urban housing type is typically different from its rural counterpart; urban locations tend to have more attached and multifamily dwellings (Joint Center for Housing Studies 2013). And, finally, the heterogeneous climate geography of the United States could influence these factors further because, for instance, the temperature and humidity profile of Louisiana differs greatly from that of New Hampshire. Because heating and cooling are among the most burdensome energy costs, region must be accounted for in energy insecurity analyses across the nation (U.S. Energy Information Administration 2012).

Energy use and expenditures also reflect a complex web of social, economic, and cultural facets. Yet, there is a dearth of research regarding energy use and energy expenses among various groups, including immigrant populations. The little existing research points to the idea that impoverished immigrants may use less energy than similarly impoverished non-immigrants (Throgmorton and Bernard 1986; Lutzenhiser 1997). Throgmorton and

Bernard's study, one of the first to look at minority energy use, found that Hispanic households used less energy on average than African American or non-Hispanic white households. Lutzenhiser's work explored this area further by also looking at English-speaking Hispanic versus Spanish-speaking-only Hispanic households (indicative of more recent immigration). His study showed that regardless of income level, Spanish-speaking Hispanic households used less energy than African American, English-speaking Hispanic, or non-Hispanic white households (Lutzenhiser 1997). While the United States has near-universal access to electricity, in many lower-income parts of the world large segments of the population still lack an adequate energy infrastructure. For example, it was estimated that in 2009 over 40% of people living on the continent of Africa did not have access to electricity. Many parts of Asia and some parts of Latin America are also without it (Li et al. 2014). People emigrating from these areas to the United States may well have a relationship with energy different from that of American-born individuals.

This paper examines the experiences of low-income families with children in the U.S. to understand which among them are most greatly affected by the dual housing hardship of rent plus energy expenditures. We seek to explore whether combined housing and utilities expenses indeed represent a "double burden" that would comprise upwards of 40% of household expenditures, including the standard 30% housing and 10% energy expenditures. The analysis provides a comprehensive and realistic perspective on economic hardship associated with basic household living expenses. From a poverty and public health perspective, the analysis offered in this paper is of critical importance, as it advances our current understanding of material hardship while pointing to often hidden health and social consequences rooted in the fundamental causes of disease and disadvantage (Link and Phelan 1995). This paper also points to important policy gaps in safety net benefits related to housing and energy.

## Data and Methodology

### American Community Survey (ACS) 2011

We employed the 2011 ACS data to answer a critical question: to what degree are low-income renters, specifically low-income families with children, disproportionately burdened by housing and utilities expenses, both independently and in tandem? ACS is an annual nationwide survey that collects information on demographic, social, economic, and housing characteristics. The U.S. Census Bureau contacts over 3.5 million households to participate in the survey each year. The universe for the ACS consists of all valid, residential housing unit addresses in all county and county equivalents in the 50 states and the District of Columbia.

**Independent variables—**A series of dummy variables for race/ethnicity and immigration status were coded using responses self-reported in the ACS data. For (1) Race and Ethnicity, the categories include (a) whites who reported as "white alone"; (b) black/African-Americans who reported as "black or African American alone"; (c) Hispanics/Latinos who reported "Hispanic origin" regardless of racial category; (d) Asians and Pacific Islanders who were combined from two categories, "API alone" and "Native Hawaiian and Other

Pacific Islander alone"; and (e) others, among them American Indians, Alaska natives, those who reported as other races alone, and those who reported as two or more major race groups. For (2) Immigration, status is coded based on the citizenship status. Those who were born in the U.S. or in Puerto Rico, Guam, the U.S. Virgin Islands, or the Northern Marianas, or who were born abroad of American parent(s), are coded as native-born; and those who are U.S. citizens by naturalization, or not citizens of the U.S., are coded as immigrant/foreign-born.

**Dependent variables—**Rent burden is coded as 1 if the family was spending more than 30% of household income on rent but otherwise coded as 0. Economic energy insecurity is coded as 1 if the family was spending more than 10% of household income on utility expenses but otherwise coded as 0. We created four groups based on the level of housing insecurity: no burden (no rent burden and no energy insecurity), energy insecurity only, rent burden only, and double-burden (rent burden and energy insecurity).

**Control variables—**Control variables include household head's age; family income level as a ratio to the federal poverty line (FPL); the household head's education level, categorized as less than high school, high school graduate, some college, or college graduate or more; region of the residence, coded as Northeast, Midwest, South, or West; geographical area type, coded as metropolitan area or rural area; and household type, including single house/small apartment building, large apartment building, or mobile home or trailer.

Multinomial logistic regression was employed to examine differences in the relative risk ratio of experiencing rent burden and economic energy insecurity against no burden among low-income families by race/ethnicity and immigration status. We controlled for various socio-economic characteristics, including the region and metropolitan status of the area of residence, family income status, education level, and household head's age. We also further stratify the analyses by region (Northeast, Midwest, South, and West) and by metropolitan status (metropolitan and rural area).

## Findings

The sample includes 63,193 households whose income is under 200% of the federal poverty line, defined as low-income, with children under age 18. This sample is comprised of about 40% percent white, 24% black/African American, 29% Hispanic/Latino, 3% API, and about 4% other race/ethnicity. Of the total population, about 2% are foreign-born/immigrant white, 2% are foreign-born/immigrant black/African American, 19% are foreign-born/immigrant Hispanic/Latino, and 3% are foreign-born/immigrant API.

Table 1 shows the percentage of low-income households with children under age 18 for four burden types (no burden, rent burden only, economic energy insecurity (EI), and double burden) by the demographic characteristics of the households. Twenty-nine percent of the sample do not have any burden, 25% experience rent burden only, 12% experience only economic EI, and about 34% experience double burden.[1] Non-Hispanic blacks are most

[1]Percentages may not add to 100 due to rounding.

likely to experience double burden (44%), followed by their experiencing no burden at all (21 percent), rent burden only (17 percent), and EI only (17 percent). Hispanics or API, however, have the largest share of families experiencing rent burden only (respectively, 36% and 45%) but the smallest share of families experiencing economic EI only. All immigrants, regardless of their race/ethnicity, are disproportionately likely to experience rent burden, but least likely to experience economic EI.

The regional difference in burden type is evident. Residents from the Northeast, Midwest, or South are inclined to experience double burden, whereas residents from the West tend to experience rent burden (43%). Among the higher end of the low-income families (150 – 200% FPL), a large percentage of families face no burden (62%), yet, among the lower end of the income spectrum (below 50% FPL), the majority of families (72%) face a double burden. The distribution of burden type by educational level is very similar for all educational groups without college degrees.

Living in a metropolitan area is a risk factor for rent burden, compared with having a rural residence. Further, those in two types of housing structures, “single-detached house” and “attached house or small apartment building (with less than 10 apartments),” share very similar burden patterns, with 35–37% of the households facing double burden, followed by the percentages of those households facing no burden, rent burden only, and EI only. Families living in large apartment buildings (with 10 apartments or more), however, are more likely to experience rent burden than other burden types.

Table 2 shows the results of multinomial logistic regression that estimate the effects of race/ethnicity and immigration status on experiencing the different types of burden, net of social and demographic covariates. The results are shown in relative risk ratios. In the far left column, the result shows that compared with native-born white families, black, Hispanic, and API families have about the same likelihood of experiencing rent burden as opposed to no burden (neither rent burden nor economic energy insecurity). However, the significant interaction terms with the immigrant and race/ethnicity variables indicate that the association between race/ethnicity and rent burden is stronger particularly for foreign-born/immigrants. The relative risk ratio of experiencing rent burden against no burden is 66% higher for immigrant whites, 49% higher for immigrant blacks/African Americans, and 20% higher for immigrant Hispanics than for native-born whites. Living in a metropolitan area instead of a rural area increased the relative ratio of experiencing rent burden against no burden by 211%. Similarly, living in an attached house or large apartment building instead of a single detached house increased the relative risk ratio by 21% and 59%, respectively.

The middle column, however, shows that when it comes to economic energy insecurity (EI), native-born non-Hispanic blacks are significantly more likely (111%) to experience such hardship than native-born whites. The significance of interaction terms between immigrant status and race/ethnicity suggest that immigrant status further reduces the relative risk ratio of experiencing economic EI against no burden. For example, the relative risk ratio of experiencing economic EI as opposed to experiencing no burden is 68% lower among foreign-born/immigrant blacks/African Americans than among native-born whites and 58% lower among foreign-born/immigrant Hispanics than among native-born whites. In contrast

to what is found for rent burden, living in an attached house or large apartment building rather than in a single detached house decreases the relative risk of experiencing economic EI against no burden by 35% and 61%, respectively, while living in mobile home or trailer increases such risk by 9%.

Shown in the far right column, native-born non-Hispanic black/African American families are 49% more likely than native-born whites to experience double burden as opposed to no burden. Immigrant minorities (except for those in the “other” category) are in general significantly less likely (about 33–45%) to experience the double burden.

Since rent and energy costs and climate vary by region, we also examined the relative risk ratio of experiencing each type of burden by region (Northeast, Midwest, South, and West). The results in Table 3 show some regional variations in the pattern of housing and energy burden for certain racial/ethnic groups, while for others the pattern was consistent across the U.S. For example, among native-born groups, in the Northeast blacks and Hispanics have higher relative risk ratio of experiencing rent burden than native-born whites. However, across four regions, native-born APIs do not differ from their native-born white counterparts in experiencing rent burden. Foreign born/immigrant minority individuals are all or mostly at a higher relative risk ratio of experiencing rent burden in the Northeast and the South, while in the Midwest they are no more likely to experience rent burden than native-born whites. This may be due to relatively inexpensive housing costs in the Midwest.

With regard to economic EI, native-born African-Americans continue to experience higher relative risk ratios than native-born whites in all regions. In the Midwest, except for Hispanics, all racial/ethnic minority groups experience higher relative risk ratios of energy insecurity than whites. In the Northeast, South, and West, native-born Hispanics and Asian-Pacific Islanders do not consistently differ at a significant level from their native-born white counterparts. As we previously found, foreign-born/immigrant Hispanics are overall significantly less likely to experience economic EI across the country.

As expected, native-born African-Americans are at a significantly higher relative risk ratio of experiencing double burden across the country; the relative risk ratios are higher than those for native-born whites by about 40–45% in the Northeast, South, and West and by 93% in the Midwest. In the Midwest, South, and West, black and Hispanic immigrants are much less likely to experience double burden than their white counterparts.

Table 4 shows results from multinomial logistic regression stratified by geographical characteristics. Since rent varies considerably depending on whether one lives in a metropolitan or rural area, we also examined whether the effects of race/ethnicity coupled with immigrant status on different burden type vary by metropolitan characteristics. With regard to rent burden only, native-born blacks have a higher relative risk ratio than native-born whites of experiencing rent burden against no burden in metropolitan areas, but they have a lower relative risk ratio of such burden in rural areas. Immigrant blacks and Hispanics are more likely than native-born whites (by 48% and 22%, respectively) to experience rent burden against no burden in metropolitan areas. Yet in rural areas, such differences were not statistically significant. This indicates that for some immigrants, living in metropolitan areas

is a risk factor for experiencing rent burden. This may be due to the fact that unlike native-born whites, newly arrived immigrants are not immediately able to take advantage of rent control where such regulation is available or to qualify for federal-level rent subsidies (i.e., Section 8 or public housing). For economic EI, the results are consistent for all racial/ethnic and immigrant groups across metropolitan and rural areas, indicating a lack of variability by geographic type.

## Discussion

This paper presents the results from a multivariate statistical analysis using data from the American Community Survey to demonstrate the relative risk of experiencing rent burden, energy insecurity, and double-burden against no burden among low-income rental households with children. Findings suggest that low-income households are more likely to experience these economic hardships in general but that specific groups are disproportionately burdened in different ways. For instance, whereas in general, immigrants are more likely to experience rental burden, they are less likely to experience energy insecurity. Many are also spared the double burden, with the exception of immigrant whites and immigrant others. After we stratify the analysis by metropolitan and rural area, results show that the differences in rent burden between minority immigrants and the native-born holds for people who reside in metropolitan areas but not for people who reside in rural areas. In other words, such disparity may be driven by the fact that immigrant families tend to concentrate in metropolitan areas, where rents are high (Singer and Wilson 2011). In contrast, native-born African Americans are more likely than all other groups to experience the double burden, and this trend was consistent regardless of the metropolitan status of the area of residence. These results may be driven by the housing stock available to certain groups due to racial residential segregation as well as decisions regarding the quality of housing low-income householders are able to afford (Friedman and Rosenbaum 2004; Hernández 2014). Interestingly, native-born Hispanics, while having virtually the same risk as the referent population for rent burden and energy insecurity, appear to be protected from the double burden in both rural and urban settings.

In the case of foreign-born householders, these findings are reminiscent of the literature on the protective factors of immigration and the mortality paradox of impoverished immigrants who have been found to live longer, healthier lives (Markides and Coreil 1986). Here, too, immigrants were less likely to experience energy insecurity, which also reduced the likelihood of the double burden. Questions regarding the behavioral and coping strategies that immigrants retain from their home countries and transfer to the new host settings touch on a series of issues that have not yet been explored in great detail in the housing literature. Not explored here are the structural conditions or quality of housing inhabited by various groups.

Ethnic enclave communities are often viewed as risk environments without consideration for the resources that they can, and do, simultaneously confer to buffer the impacts of low socioeconomic status (Martins et al. 2014). Although this may not be universally true, the concept does beg an understanding of the potential ways in which immigrants may improve their own living conditions. Authors including Mike Davis have discussed past trends

whereby Hispanic/Latino immigrants have historically 'tropicalized cold urban space,' characterized by their transformation of often dilapidated areas into revitalized neighborhoods (Davis 2000). It may also be possible that immigrants are more likely to spend additional resources on newer and energy-efficient homes, which mitigate their energy costs. Indeed, the statistical analysis demonstrates that immigrants are on average at higher risk of rent burden than of energy insecurity. However, the mechanisms by which immigrants save on energy expenditures may simultaneously have adverse implications for their health and well-being.

While the empirical evidence is scant, recent work has linked utilities hardships to complex coping strategies and utilities disconnections to broader material hardship associated with maternal physical and mental health (Heflin et al. 2011 and 2012; Hernández 2014). Thus, there may also be differences in strategies to cope with economic hardship, which may have health consequences. For example,Heflin et al. (2011) found that the majority of low-income families usually do not pay the full amount of their utility bills but, rather, pay them partially to avoid service interruptions. Meanwhile, low-income households are also more likely to resort to expensive and unsafe coping strategies to keep their homes warm in the winter, such as using their stoves or electric space heaters for heat (Harrington et al. 2005; Hernández 2014; Wilkinson et al. 2001; Wilkinson et al. 2004). Conversely, an equally troubling possibility is that families may sacrifice thermal comfort by simply living in uncomfortably hot or cold homes. "Doubling up," as defined as having more than one family or additional adults living in the home, is another coping strategy seen in low-income households, particularly in immigrant households. For example, the Schill et al. study (1998) in New York City found that foreign-born renter households were far more likely to be overcrowded and have more than one person per room than native-born households.

Low-income and immigrant households tend to be more crowded, of lower quality and poorer structural conditions, and more likely to have pest infestations than middle- or high-income households (Evans 2004; Krieger et al. 2002; Rauh et al. 2002). All of these housing conditions are associated with poor health outcomes, including asthma, cardiovascular disease, and mental health problems (Evans 2004; Krieger et al. 2002; Rauh et al. 2002). Therefore, if foreign-born households are compromising their comfort, health, and safety simply to save money, they may pay a higher price later in life in the form of stress and/or chronic illness.

## Limitations

Many of the relationships indicated by this analysis bolster the hypothesis that energy insecurity is mediated by housing condition or quality. Unfortunately, however, the dataset in use does not have housing condition/quality indicators. Another concern pertains to Census regions used as a measurement of climate and/or regional cost differences. Census regions are geographically vast and may be heterogeneous. They may, consequently, be incomparable. Metropolitan status is similarly crude in measure. The metropolitan versus rural classification excludes nuances of suburban, exurban, or other such development types. Finally, the racial/ethnic category of 'other' demonstrates several interesting relationships that often deviate from those among other racial groups. The degree to which this

relationship is meaningful or who the findings pertain to, however, is unknown, because this grouping is typically an agglomeration of subpopulations that do not exactly match traditional census categorizations.

## Conclusion

Immigrant families are more likely to live in poverty, and experience more economic hardship, than native-born families, due to lack of education, limited English proficiency, or, if undocumented, limited access to social safety net programs and employment options (Landale et al. 2011; Waters and Jiménez 2005). However, this study shows surprising findings with regard to how immigrant families strive to make ends meet and save where they can. In particular, immigrant families tend to spend less on their energy bills, which results in having a lower relative risk of experiencing the double burden of rent and utility bills. We believe this is reflective, in part, of home-country values and practices centered on energy conservation and modest living. Further research into this phenomenon may significantly contribute to public health, energy efficiency, and equity efforts. Findings also support the notion that the urban environment is energy efficient compared with rural settings. Future research should endeavor to address the following gaps: 1) accounting for energy expenditures in overall material hardships; 2) comparing low-income native-born and immigrant families' housing/living conditions; 3) investigating the differences regarding home energy use and conservation between native-born and immigrant households; 4) determining the role of finer-scale geographic and climate influences on energy use; 5) understanding the influence of age and family structure, i.e., if the elderly are impacted differently from younger families; and 6) understanding any health consequences associated with conservation efforts. These lessons could be used to promote energy conservation, reduce financial burdens for the economically vulnerable, and improve health. Future policy measures should consider energy insecurity when measuring household expenditures, so as to have a fuller account of burdens borne by basic living expenses. As an emerging framework, the study of the double burden of rental burden plus energy insecurity begins to disentangle the current black box of material hardship by helping to illuminate its role at the intersection of social and built environments.

## Biographies

Diana Hernández, Ph.D., is an assistant professor of sociomedical sciences at Columbia University's Mailman School of Public Health and JPB environmental health fellow at the Harvard T.H. Chan School of Public Health. Her research focuses on the social and environmental determinants of health, specifically evaluating the impacts of policy and place-based interventions on the health and socioeconomic well-being of vulnerable populations. Dr. Hernández's community-oriented research examines the intersections among the built environment (housing and neighborhoods), poverty/equity, and health, with a particular emphasis on energy insecurity.

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Douglas Phillips has worked on several studies involving low-income populations and housing, as well as research with currently incarcerated and recent parolee populations. He received his M.P.H. from Columbia University's Mailman School of Public Health in 2013.

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**Table 1**

Descriptive characteristics of low-income renter-occupied households with children under age 18 by burden type (N=63,193)

| | | No burden | Rent burden only | EI only | Double burden |
|---|---|---|---|---|---|
| **Variable** | **N** | **Percent** | **Percent** | **Percent** | **Percent** |
| **All** | 63,193 | 28.7% | 24.6% | 12.5% | 34.1% |
| **Race/ethnicity** | | | | | |
| Non-Hispanic white | 25,117 | 32.6% | 19.5% | 14.0% | 34.0% |
| Non-Hispanic black | 15,223 | 21.1% | 17.1% | 17.4% | 44.4% |
| Hispanic | 18,510 | 29.7% | 36.3% | 6.7% | 27.3% |
| API | 2,036 | 27.1% | 44.9% | 3.7% | 24.3% |
| Other | 2,307 | 31.0% | 18.4% | 19.5% | 31.2% |
| **Immigrant** | | | | | |
| Foreign-born/immigrant white | 1,410 | 24.5% | 39.6% | 4.0% | 31.8% |
| Foreign-born/immigrant non-Hispanic black | 1,238 | 25.5% | 36.3% | 5.4% | 32.7% |
| Foreign-born/immigrant Hispanics/Latinos | 12,155 | 30.8% | 40.4% | 5.0% | 23.9% |
| Foreign-born/immigrant API | 1,804 | 27.3% | 45.7% | 3.5% | 23.4% |
| Foreign-born/immigrant other | 273 | 24.9% | 35.5% | 6.2% | 33.3% |
| **Region** | | | | | |
| Northeast | 8,368 | 22.7% | 25.2% | 11.0% | 41.1% |
| Midwest | 11,649 | 32.5% | 13.5% | 16.8% | 37.3% |
| South | 25,816 | 29.7% | 16.9% | 16.5% | 37.0% |
| West | 17,360 | 27.7% | 43.4% | 4.6% | 24.3% |
| **Poverty status** | | | | | |
| Family income below 50% FPL | 15,210 | 7.2% | 10.7% | 9.8% | 72.3% |
| Family income 50%–100% FPL | 19,428 | 16.1% | 28.4% | 15.4% | 40.1% |
| Family income 100%–150% FPL | 16,295 | 38.8% | 33.0% | 14.2% | 14.0% |
| Family income 150%–200% FPL | 12,260 | 62.2% | 24.7% | 9.2% | 3.9% |
| **Household head education** | | | | | |
| Less than high school | 16,779 | 26.7% | 25.6% | 12.7% | 34.9% |

| | | No burden | Rent burden only | EI only | Double burden |
|---|---|---|---|---|---|
| **Variable** | **N** | **Percent** | **Percent** | **Percent** | **Percent** |
| High school | 20,204 | 30.1% | 22.4% | 13.4% | 34.0% |
| Some college | 21,715 | 28.9% | 23.8% | 12.8% | 34.5% |
| College degree or above | 4,495 | 29.1% | 34.7% | 6.9% | 29.3% |
| **Metropolitan Status** | | | | | |
| Rural area | 11,631 | 34.9% | 9.0% | 24.4% | 31.7% |
| Metropolitan area | 47,427 | 26.6% | 29.5% | 9.0% | 34.9% |
| **Housing type** | | | | | |
| Single detached house | 25,490 | 29.6% | 18.7% | 15.2% | 36.6% |
| Attached house or small apartment building | 23,099 | 27.4% | 27.6% | 10.6% | 34.5% |
| Large apartment building | 9,725 | 26.9% | 41.5% | 5.3% | 26.3% |
| Mobile home or trailer | 4,852 | 34.3% | 8.0% | 22.6% | 35.2% |

**Table 2**

Results from Multinomial logistic regression

| N=63193 | Rent burden | | | EI only | | | Double burden | | |
|---|---|---|---|---|---|---|---|---|---|
| | Relative risk ratios | | Std. err. | Relative risk ratios | | Std. err. | Relative risk ratios | | Std. err. |
| **Race/ethnicity (reference: Native-born non-Hispanic white)** | | | | | | | | | |
| Native born, non-Hispanic black | 1.03 | | 0.04 | **2.11** | ** | 0.09 | **1.49** | ** | 0.06 |
| Native-born Hispanic | 1.03 | | 0.05 | 1.06 | | 0.06 | **0.85** | ** | 0.04 |
| Native-born API | 1.13 | | 0.21 | 0.87 | | 0.29 | 1.12 | | 0.24 |
| Native-born other | **0.67** | ** | 0.05 | **1.57** | ** | 0.12 | **0.70** | ** | 0.05 |
| Foreign-born/immigrant white | **1.66** | ** | 0.13 | **0.54** | ** | 0.08 | **1.18** | + | 0.11 |
| Foreign-born/immigrant non-Hispanic black | **1.49** | ** | 0.13 | **0.32** | ** | 0.05 | **0.70** | ** | 0.07 |
| Foreign-born/immigrant Hispanics/Latinos | **1.20** | ** | 0.05 | **0.42** | ** | 0.03 | **0.68** | ** | 0.03 |
| Foreign-born/immigrant API | **1.16** | | 0.22 | **0.52** | + | 0.19 | **0.55** | ** | 0.13 |
| Foreign-born/immigrant other | **2.15** | ** | 0.42 | **0.60** | + | 0.17 | **1.87** | ** | 0.40 |
| **Region (reference: West)** | | | | | | | | | |
| Northeast | **0.69** | ** | 0.03 | **3.56** | ** | 0.22 | **2.83** | ** | 0.13 |
| Midwest | **0.32** | ** | 0.01 | **2.28** | ** | 0.12 | **1.12** | ** | 0.05 |
| South | **0.42** | ** | 0.01 | **2.36** | ** | 0.12 | **1.31** | ** | 0.05 |
| **Poverty status (reference: 150–200% FPL)** | | | | | | | | | |
| Family income below 50% FPL | **4.40** | ** | 0.22 | **10.81** | ** | 0.61 | **244.51** | ** | 14.96 |
| Family income 50%–100% FPL | **5.28** | ** | 0.18 | **6.80** | ** | 0.31 | **52.87** | ** | 2.88 |
| Family income 100%–150% FPL | **2.38** | ** | 0.07 | **2.47** | ** | 0.11 | **6.45** | ** | 0.36 |
| **Household head education (reference: college degree or above)** | | | | | | | | | |
| Less than high school | **0.46** | ** | 0.02 | **1.35** | ** | 0.10 | **0.54** | ** | 0.03 |
| High school graduates | **0.58** | ** | 0.03 | **1.16** | * | 0.09 | **0.62** | ** | 0.04 |
| Some college | **0.71** | ** | 0.03 | **1.30** | ** | 0.10 | **0.80** | * | 0.05 |
| **Age of household head** | **1.01** | ** | 0.00 | **1.02** | ** | 0.00 | **1.02** | ** | 0.00 |
| **Metropolitan area** | **3.11** | ** | 0.13 | **0.70** | ** | 0.02 | **2.04** | ** | 0.07 |
| **Housing type (reference: single detached house)** | | | | | | | | | |

| N=63193 | Rent burden | | | EI only | | | Double burden | | |
|---|---|---|---|---|---|---|---|---|---|
| | Relative risk ratios | | Std. err. | Relative risk ratios | | Std. err. | Relative risk ratios | | Std. err. |
| Attached house or small apartment building | **1.21** | ** | 0.04 | **0.65** | ** | 0.02 | **0.59** | ** | 0.02 |
| Large apartment building | **1.58** | ** | 0.04 | **0.39** | ** | 0.02 | **0.44** | ** | 0.02 |
| Mobile home or trailer | **0.44** | ** | 0.03 | **1.09** | + | 0.06 | **0.72** | ** | 0.04 |
| **Constant** | **0.25** | ** | 0.02 | **0.04** | ** | 0.00 | **0.02** | ** | 0.00 |

** Significance p<.01;

* p<.05;

+ p<.10

**Table 3**

Results from Multinomial Logistic Regression by Region

| **No Burden (base outcome)** | **Northeast (N=7,932)** | | **Midwest (N=10,882)** | | **South (N=23,520)** | | **West (N=16,724)** | |
|---|---|---|---|---|---|---|---|---|
| | **Relative risk ratios** | **Std. err.** | **Relative risk ratios** | **Std. err.** | **Relative risk ratios** | **Std. err.** | **Relative risk ratios** | **Std. err.** |
| **Rent burden only** | | | | | | | | |
| Race/ethnicity (reference: Native-born Non-Hispanic White) | | | | | | | | |
| Native-born, non-Hispanic Black | **1.26** * | 0.15 | **1.42** ** | 0.13 | **0.82** ** | 0.05 | 1.11 | 0.11 |
| Native-born Hispanic | **1.51** ** | 0.18 | 1.23 | 0.19 | 0.93 | 0.07 | 0.91 | 0.06 |
| Native-born API | 0.28 | 0.22 | 0.92 | 1.11 | 1.30 | 0.59 | 1.17 | 0.25 |
| Native-born other | 1.11 | 0.29 | **0.64** * | 0.14 | 0.87 | 0.14 | **0.51** ** | 0.06 |
| Foreign-born/immigrant white | **3.20** ** | 0.61 | **1.51** * | 0.32 | **1.51** * | 0.22 | **1.37** * | 0.18 |
| Foreign-born/immigrant non-Hispanic black | **1.58** ** | 0.26 | 0.69 | 0.19 | **1.99** ** | 0.24 | 0.77 | 0.18 |
| Foreign-born/immigrant Hispanics/Latinos | **1.33** * | 0.16 | 0.79 | 0.14 | **1.16**+ | 0.09 | 1.02 | 0.05 |
| Foreign-born/immigrant API | **9.65** ** | 7.88 | 1.82 | 2.24 | 0.93 | 0.45 | **1.31** ** | 0.07 |
| Foreign-born/immigrant other | **2.80** * | 1.22 | 0.91 | 0.60 | 1.50 | 0.58 | **0.40** ** | 0.04 |
| **EI burden only** | | | | | | | | |
| No Burden (base outcome) | Northeast | | Midwest | | South | | West | |
| Race/ethnicity (reference: Native-born, non-Hispanic white) | | | | | | | | |
| Native born, non-Hispanic black | **1.67** ** | 0.22 | **2.27** ** | 0.20 | **2.09** ** | 0.11 | **2.93** ** | 0.49 |
| Native-born Hispanic | 1.24 | 0.18 | 1.22 | 0.19 | 0.95 | 0.08 | 1.14 | 0.15 |
| Native-born API | 0.51 | 0.42 | **4.08**+ | 3.43 | 0.19 | 0.21 | 1.05 | 0.52 |
| Native-born other | 0.97 | 0.29 | **1.46** * | 0.23 | **1.44** * | 0.20 | **1.97** ** | 0.28 |
| Foreign-born/immigrant White | 1.07 | 0.31 | **0.51** * | 0.17 | **0.29** ** | 0.09 | 0.67 | 0.23 |
| Foreign-born/immigrant non-Hispanic black | **0.36** ** | 0.10 | **0.36** * | 0.13 | **0.25** ** | 0.06 | 0.68 | 0.28 |

| **No Burden (base outcome)** | **Northeast (N=7,932)** | | **Midwest (N=10,882)** | | **South (N=23,520)** | | **West (N=16,724)** | |
|---|---|---|---|---|---|---|---|---|
| | **Relative risk ratios** | **Std. err.** | **Relative risk ratios** | **Std. err.** | **Relative risk ratios** | **Std. err.** | **Relative risk ratios** | **Std. err.** |
| Foreign-born/immigrant Hispanics/Latinos | **0.37** ** | 0.07 | **0.45** ** | 0.09 | **0.48** ** | 0.05 | **0.66** ** | 0.07 |
| Foreign-born/immigrant API | 0.75 | 0.66 | 0.19 + | 0.17 | 2.25 | 2.48 | **0.43** ** | 0.06 |
| Foreign-born/immigrant other | 1.27 | 0.78 | 0.61 | 0.38 | 0.68 | 0.35 | 1.12 | 0.17 |
| **Double burden** | | | | | | | | |
| No Burden (base outcome) | Northeast | | Midwest | | South | | West | |
| Race/ethnicity (reference: Native-born non-Hispanic white) | | | | | | | | |
| Native-born non-Hispanic black | **1.41** ** | 0.16 | **1.93** ** | 0.16 | **1.40** ** | 0.07 | **1.45** * | 0.17 |
| Native-born Hispanic | **1.35** ** | 0.16 | 1.06 | 0.15 | **0.75** ** | 0.06 | **0.66** ** | 0.06 |
| Native-born API | 0.46 | 0.29 | **4.93**+ | 4.64 | 0.43 | 0.23 | 1.16 | 0.31 |
| Native-born other | 1.03 | 0.25 | **0.70** * | 0.12 | 0.86 | 0.12 | **0.48** ** | 0.06 |
| Foreign-born/immigrant white | **2.33** ** | 0.47 | 1.42 | 0.32 | 0.81 | 0.15 | 0.86 | 0.15 |
| Foreign-born/immigrant non-Hispanic black | 1.13 | 0.20 | **0.45** * | 0.13 | **0.66** * | 0.09 | **0.51** * | 0.16 |
| Foreign-born/immigrant Hispanics/Latinos | 0.89 | 0.11 | **0.73**+ | 0.13 | **0.70** ** | 0.06 | **0.59** ** | 0.05 |
| Foreign-born/immigrant API | 2.47 | 1.61 | **0.17**+ | 0.17 | 1.42 | 0.80 | **0.35** ** | 0.10 |
| Foreign-born/immigrant other | **3.04** * | 1.37 | 0.88 | 0.52 | 1.63 | 0.67 | 1.33 | 0.51 |

Note: Controlling for all the socioecomic characteristics that were presented in Table 2.

Significance **p<.01;

*p<.05;

+p<.10

**Table 4**

Results from multinomial logistic regression by geographical area

| No burden (base outcome) | Rent burden only | | | | EI burden only | | | | Double Burden | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Metropolitan (N=47,427) | | Rural (N=11,631) | | Metropolitan (N=47,427) | | Rural (N=11,631) | | Metropolitan (N=47,427) | | Rural (N=11,631) | |
| **Race/ethnicity (reference group: Native-born, non-Hispanic white)** | **Relative risk ratios** | **Std. err.** | **Relative risk ratios** | **Std. err.** | **Relative risk ratios** | **Std. err.** | **Relative risk ratios** | **Std. err.** | **Relative risk ratios** | **Std. err.** | **Relative risk ratios** | **Std. err.** |
| Native-born, non-Hispanic black | **1.08**$^{+}$ | 0.04 | **0.74**$^{*}$ | 0.10 | **2.22**$^{**}$ | 0.11 | **1.86**$^{**}$ | 0.15 | **1.51**$^{**}$ | 0.06 | **1.43**$^{**}$ | 0.13 |
| Native-born Hispanic | 1.08 | 0.05 | 0.81 | 0.13 | 1.08 | 0.07 | 0.94 | 0.12 | **0.88**$^{*}$ | 0.05 | **0.70**$^{**}$ | 0.10 |
| Native-born API | 1.16 | 0.22 | 1.72 | 1.01 | 0.95 | 0.35 | 0.52 | 0.43 | 1.29 | 0.29 | **0.09**$^{*}$ | 0.11 |
| Nativeborn other | **0.79**$^{*}$ | 0.07 | **0.41**$^{**}$ | 0.07 | **1.48**$^{**}$ | 0.17 | **1.40**$^{**}$ | 0.15 | 0.87 | 0.09 | **0.40**$^{**}$ | 0.05 |
| Foreign-born/immigrant white | **1.74**$^{**}$ | 0.15 | **1.62**$^{+}$ | 0.42 | **0.55**$^{**}$ | 0.10 | **0.48**$^{*}$ | 0.15 | **1.27**$^{*}$ | 0.13 | **0.57**$^{+}$ | 0.17 |
| Foreign-born/immigrant non-Hispanic black | **1.48**$^{**}$ | 0.13 | 0.90 | 0.72 | **0.32**$^{**}$ | 0.05 | **0.24**$^{*}$ | 0.16 | **0.69**$^{**}$ | 0.07 | 0.81 | 0.48 |
| Foreign-born/immigrant Hispanics/Latinos | **1.22**$^{**}$ | 0.06 | 0.95 | 0.18 | **0.40**$^{**}$ | 0.03 | **0.49**$^{**}$ | 0.08 | **0.69**$^{**}$ | 0.04 | **0.55**$^{**}$ | 0.10 |
| Foreign-born/immigrant API | 1.14 | 0.22 | 1.37 | 0.95 | **0.49**$^{+}$ | 0.19 | 1.27 | 1.21 | **0.46**$^{**}$ | 0.11 | **27.59**$^{*}$ | 33.87 |
| Foreign-born/immigrant other | **1.82**$^{*}$ | 0.36 | **7.16**$^{**}$ | 4.92 | 0.69 | 0.22 | 0.47 | 0.40 | **1.53**$^{+}$ | 0.35 | 3.14 | 2.44 |

Note: Controlling for all the socioecomic characteristics that were presented in Table 2.

Significance **p<.01;

$^{*}$p<.05;

$^{+}$p<.10