RACIAL DISPARITY IN MANUFACTURED HOUSING: A STUDY OF AFFORDABILITY IN THE UNITED STATES

By

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ABSTRACT

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Due to historical racial discrimination and the generational wealth gap, as of 2017, low-income populations are disproportionately made up of people of color. Since manufactured housing is one of the most affordable housing options for low-income populations, it is unclear why whites are more likely to occupy manufactured housing than people of color. Understanding this phenomenon could address the housing needs of households of color, especially during the affordability crisis. County-level data from the 2013-2017 American Community Survey 5-Year Estimates and the 2010 U.S. Census were analyzed to determine associations between Black, Hispanic/Latinx, and Non-Hispanic White manufactured housing occupancy and four independent variables: racial disparities in homeownership, the geographic distribution of manufactured homes across rural and urban locations and across census divisions (i.e., regions of the country), and the age of residents using linear regression. Despite significance in the relationships, all were substantively small. The most prominent takeaway from this study is the severity of the racial homeownership gap for Black and Hispanic/Latinx households in comparison to Non-Hispanic Whites. In addition, that Hispanic/Latinx households are less likely to live in mobile homes as they become homeowners and are more likely to live in mobile homes in rural areas. The study concludes with a discussion of policy and planning implications, including ways to eliminate barriers to manufactured housing as an affordable housing opportunity for communities of color.

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Chapter 1: Introduction

Homeownership in the United States has long been associated with the "American Dream," a concept passed down from the founding fathers, as it was thought that citizens would hold a higher amount of loyalty to a nation when they had a stake in it (Wright, 1983). However, as the term "citizens" have grown to include disenfranchised populations, many disenfranchised groups have faced considerable obstacles in accessing the "American Dream" of homeownership (Shlay, 2006). Communities of color have historically been restricted from various levels of homeownership through racial and economic zoning and redlining, contributing to the racial wealth and homeownership gap still present today (Rothstein, 2017; Gyourko et al., 1999; Boehm & Schlottmann, 2004). For example, after the foreclosure crisis and Great Recession that began in 2007, people of color were more likely to become renters than maintain homeownership, and from 2001 to 2016 Black and Hispanic/Latinx renters were about 10% more burdened by housing costs than white renters (Joint Center for Housing Studies of Harvard University, 2017).

With real estate and rental housing markets currently surging during the current affordable housing crisis in the United States, the supply of available rental units has not met the demand, specifically with communities of color and very low-income families (Joint Center for Housing Studies of Harvard University, 2017; U.S. Department of Housing and Urban Development, 2019). In addition, rising housing prices in metro areas, have provided little opportunity for traditional homeownership for low-income populations (Joint Center for Housing Studies of Harvard University, 2018). Manufactured housing is one of the most affordable housing types for low-income populations, but the majority of residents in manufactured housing are white (Durst & Sullivan, 2019). As of 2017, due to historical racial discrimination and the generational wealth gap, low-income populations are disproportionately made up of people of color, specifically Black,

Hispanic/Latinx, and Native American populations. (Aurand et al., 2019; U.S. Census Bureau, 2017). Since manufactured housing is one of the most affordable housing options for low-income populations, it is unclear why whites are more likely to occupy manufactured housing than people of color (Durst & Sullivan, 2019). Understanding why this is the case may be an important means of addressing the housing needs of households of color, and especially the need for affordably priced housing options.

To address this gap in the literature, this study answers two research questions:

1. Manufactured housing is an affordable housing option for low-income communities; however, the majority of manufactured housing residents are white. As African American, Latinx, and Native American communities are a larger representation of low-income populations, why are there not a greater proportion of African American, Latinx, and Native American residents occupying manufactured housing?
2. How can policy promote access to this affordable housing option in communities of color?

1.1. Motivation

1.1.1. Aims

This study examines four potential explanations for this disparity in mobile home occupancy and its potential implications for planning and policy. The first hypothesis of this study is that Black, Latinx, and Native Americans are underrepresented in manufactured housing simply because they are in homeownership in general. The second hypothesis is that there are less people of color residing in manufactured housing because manufactured housing is located disproportionately in rural areas, while communities of color reside disproportionately in mostly urban areas. The third hypothesis is there are less people of color residing in manufactured housing because of the uneven distribution of manufactured housing across different regions (i.e., census

divisions) of the country. Lastly, the fourth hypothesis is that Black and Latinx households may be less likely to have older residents (65+) live in manufactured housing as they enter manufactured housing as a means of affordability, unlike white households. The analysis in this study is conducted using 5-Year Estimates from the 2013-2017 American Community Survey and data from the 2010 U.S. decennial census at the county level in the United States. The study concludes with a discussion of policy and planning implications, including ways to eliminate barriers to manufactured housing as an affordable housing opportunity for communities of color.

1.1.2. Expected Findings

The expected findings of this study were to see an underrepresentation in manufactured housing occupancy by communities of color. However, the level of representation would change based on geographic division areas of the country, as well as urban and rural boundaries. The amount of manufactured housing would differ depending on location, for example as greater amounts of manufactured housing and a larger African American population are located in the south, a racial disparity may not occur (Jovan and Joseph, 1997). In addition, for rural areas manufactured housing is a prevalent housing choice, as rural areas have twice the national rate of manufactured housing (George and Barr, 2005). As less communities of color live in rural areas across the United States, Non-Hispanic White households may have a higher occupancy rate.

Another expected finding was that the racial disparity in manufactured housing may be closely associated with racial disparities in homeownership, as people of color are also underrepresented in homeownership. . Lastly, I also anticipated that that the majority of the white population who reside in manufactured housing would be 65 years of age or older, as they may no longer be concerned with building equity or may be investing in a “second home” for retirement (Jovan and Joseph, 1997). In comparison, it is expected that people of color who reside in

manufactured housing will be younger entry-level residents and who will utilize manufactured housing as a means of affordability.

1.1.3. Potential Implications

This study on racial disparities in manufactured housing can help identify potential solutions for the current housing affordability crisis (Herbert et al., 2005). Addressing barriers to African American, Latinx, and Native American occupancy in manufactured homes is key to increasing affordable housing opportunities because manufactured housing is a viable affordable housing option for low-income communities (MacTavish, 2009; U.S. Census Bureau, 2017). This study may assist in identifying locations where the development and placement of manufactured homes could help relieve the current affordability crisis.

1.2. Structure

The study is developed in four chapters. Chapter 2 begins with a review of the literature on the affordable housing crisis, the historical racial disparity in access to housing, and the affordability of manufactured housing. Chapter 3 describes the data and methods used in the study, including an analysis of descriptive statistics, choropleth maps, and regression analysis using data derived from the 2013-2017 American Community Survey 5-Year Estimates and the 2010 U.S. decennial census. Chapter 4 contains the results of the analysis for each hypothesis, and the fifth chapter will conclude with a summary of the findings and policy and planning implications, the limitations of the study, and recommendations for future research.

Chapter 2: Literature Review

People of color make up a disproportionate percentage of the low-income population in comparison to whites (U.S. Census Bureau, 2017). Meanwhile with manufactured housing as one of the most affordable housing options for low-income populations, it is unclear why people of color are less likely to live in manufactured housing than whites (Durst & Sullivan, 2019). In order to address this question this chapter begins with an overview of the affordable housing crisis to identify the need for innovative solutions to combat affordability challenges faced by low-income populations. The review then examines the racial disparity in access to housing throughout the history of the United States. In order to identify manufactured housing as a potential solution to the affordability crisis an introduction to manufactured housing and their level of affordability is discussed. Finally, the literature regarding the racial disparities in manufactured housing occupancy is presented.

2.1. Affordable Housing Crisis

Due to the weak housing market created by the foreclosure crisis, an influx of renters has hit the real estate market (Joint Center for Housing Studies of Harvard University, 2017). Renters are now more likely to be families with children, people of color, and low-income than homeowners (Joint Center for Housing Studies of Harvard University, 2017). Currently, low-income renters cannot afford the cost of a modest rental home, as unaffordability is due to low wages, a shortage of affordable rental homes, racial inequities, and wage inequality (Aurand et al., 2019).

In addition, there is a lack of mobility in the housing market with a limited inventory of homes for sale and rent (Joint Center for Housing Studies of Harvard University, 2018). New construction is geared toward higher-income renters, yet older housing stock is not trickling down

to low-income renters as expected (Aurand et al., 2019; Joint Center for Housing Studies of Harvard University, 2017). In strong markets landlords are reinvesting in their properties to attract higher rents, and in weak markets landlords are incentivized to find other uses for the property as rent would not cover general upkeep and maintenance (Aurand et al., 2019; Joint Center for Housing Studies of Harvard University, 2017). Since construction has not met demand, the competition for a low supply of existing homes continues to raise prices (Joint Center for Housing Studies of Harvard University, 2018). Higher-income households have also been occupying rental homes in the private market that are affordable for lower-income households (Aurand et al., 2019). With a shortage of subsidized housing and less low-cost rentals available on the market, low-income populations are left with few choices for rental housing (Joint Center for Housing Studies of Harvard University, 2018).

For low-income renters, only 37 affordable homes exist for every 100 in need, and no state has an adequate supply (Aurand et al., 2019). The national median rent increased 20% faster and the median home price increased 41% faster than inflation from 1990-2016 (Joint Center for Housing Studies of Harvard University, 2018). Since the foreclosure crisis, the rate of housing cost-burden has also increased for renters and has now decreased for homeowners (Joint Center for Housing Studies of Harvard University, 2017; Dumont, 2019). Cost-burdened renters have risen, with almost 50% of renters paying more than the federal standard threshold of affordability (30% of their income on housing) and are more likely to be households with income at or below the poverty level (Joint Center for Housing Studies of Harvard University, 2018; Aurand et al., 2019). Cost-burdened renters are more likely to limit spending on other essential needs such as food, healthcare, and transportation (Aurand et al., 2019). Cost-burdened renters are also at a greater risk for housing instability (Aurand et al., 2019). Housing instability for low-income

households can lead to frequent moves for families or periods of homelessness, both of which can have serious repercussions for a child's academic success (Crowley, 2003).

However even before the foreclosure crisis in 2005, the Department of Housing and Urban Development issued a report stating low-income and minority households were behind the national average for homeownership (Herbert et al., 2005). The key barriers to homeownership facing low-income and minority households were a lack of savings to purchase the home (down payment and the closing costs), as well as racial discrimination (Herbert et al., 2005).

2.2. Historical Racial Disparity in Access to Housing

Homeownership is a tax- favored status, whose home equity plays a key role in the creation and retention of household wealth in the United States (Gyourko et al., 1999). Mortgage interest deduction, exclusion of significant portions of capital gains, property tax deductions, and exclusion of imputed rental income on owner-occupied housing are some of the many advantages the tax code offer homeowners (Poterba & Sinai, 2008). However, communities of color, and specifically African Americans, have historically been restricted from various levels of homeownership through racial and economic zoning and redlining, contributing to the racial wealth and homeownership gap that is still present today (Rothstein, 2017; Gyourko et al., 1999; Boehm & Schlottmann, 2004). While racial zoning, prohibiting African Americans to purchase homes on blocks with a white majority, was deemed unconstitutional in 1917 by the *Buchanan v. Warley* Supreme Court ruling due to its infringement of property owner rights, economic exclusionary zoning became an encouraged method to keep African Americans out of white communities (Callies & Simon, 2017; Rothstein, 2017). Economic zoning, exclusionary zoning to low-income households who were unable to afford single-family homes zoned in middle-class white

neighborhood, was rare prior to the racially charged zoning rush after the *Buchanan v. Warley* decision ruling (Rothstein, 2017).

In the 1960's real estate market "blockbusting", the fear mongering of agents claiming that property values would drop due to members of minority groups moving into the neighborhood, led to white flight and assisted suburbanization (Ouazad, 2015; Rothstein, 2017). This reaction created a market of inflation for African American homebuyers, most of whom were unable to procure a traditional mortgage loan from the Federal Housing Administration (FHA) or bank due to "credit blacklisting" or "redlining" (Jacobs, 1961; Pogge, 1992; Rothstein, 2017). The term redlining refers to the color of the lines drawn around supposedly "high risk areas,", most of which were minority neighborhoods, on security maps made by lending institutions (Pogge, 1992; Rothstein, 2017). Homes were sold to African American homebuyers on installment plans known as contract sales, in which no equity accumulated from down payments or monthly payments for 15 to 20 years (Rothstein, 2017). If one monthly payment was late owner-speculators could evict the would-be-owner and sell to another contract sales buyer (Rothstein, 2017).

Homeownership for a white homebuyer was 1.6 times more likely than that of an African American homebuyer in 1970, and that same proportion existed still in 1990 (Gyourko et al., 1999). Within the 1990s African American mortgage applicants were almost twice as likely to be rejected in comparison to white households, accounting for credit history and household wealth (Charles & Hurst, 2002). However African Americans were less likely to apply for a mortgage in the first place, due to a lack of assistance available for a down payment (Charles & Hurst, 2002). While those with sufficient wealth amongst all races have no difference in homeownership levels, whites with constrained wealth have higher rates of homeownership than minorities (Gyourko et al., 1999). Due to generational wealth, 27% white applicants had assistance from family, which

plays a large role in determining whether a household procures a mortgage, in comparison to 7% of black households (Charles & Hurst, 2002). A large part of the minority population is less likely to achieve and/or maintain homeownership status due to their overrepresentation in lower-income brackets. (Gyourko et al., 1999; Boehm & Schlottmann, 2004). Even as the number of African Americans becoming first-time homebuyers during the 2000-decade increased, purchasing a home was not a prosperous asset accumulation for low to moderate-income African American families, while white first-time homebuyers experienced a short-term increase in total net worth during the years between recessions (2003-2005) (Newman & Holupka, 2016). If a city's housing market managed to come out unscathed during the recessions, while white first-time homebuyers would also be unscathed, African American first-time homebuyers' net worth would decline regardless (Newman & Holupka, 2016).

With the 2008 bursting of the housing bubble, lenders use of "reverse redlining", providing gratuitous marketing of exploitative loans targeting minority communities, created a further divide in the wealth gap for African American households (Fisher, 2009; Rothstein, 2017). Finding any path to renting or homeownership can be difficult for communities of color, as the credit scoring system was founded in a history of racial housing discrimination, and disparately impacts communities of color (Rice and Swesnik, 2012). In California, Hispanic/Latinx renters face significant levels of discrimination when inquiring about the availability of homes for sale, and Hispanic homebuyers are discriminated against for financial assistance (Turner & Ross, 2003). Research on discrimination in housing practices in the 2000s also found that Native Americans experienced greater levels of discrimination for rental housing within the states of Montana, Minnesota, and New Mexico than the national levels of discrimination from all other minorities combined (Turner & Ross, 2003).

In fact, the homeownership gap continues to widen between people of color and white Americans today (Joint Center for Housing Studies of Harvard University, 2018). Native American, Black, and Latinx households are more likely to be low-income renters who are below the poverty level than white households, as the white population has higher levels of homeownership and higher incomes (Aurand et al., 2019). This places a greater cost-burden on housing for communities of color, and thus on their ability to pay for food, healthcare and transportation (Aurand et al., 2019). Ultimately the barrier of unaffordable housing diminishes the ability for communities of color to provide the best life for their families. One potential solution to the affordable housing crisis that is disproportionately affecting communities of color would be access to more affordable housing units, such as manufactured housing.

2.3. Introduction to Manufactured Housing

The U.S. Department of Housing and Urban Development defines manufactured housing as housing units that are "built in the controlled environment of a manufacturing plant and are transported in one or more sections on a permanent chassis" (U.S. Department of Housing and Urban Development, 2019, p.1). The term "mobile homes" and "manufactured housing" are used interchangeably, as federal regulations changed over to the term "manufactured housing" in 1980 (Beamish et al., 2001). Throughout this paper both terms will be used interchangeably as well. While the term "mobile home" often conjures up pictures of rural living, 46% of manufactured units are located in metropolitan areas (Durst and Sullivan, 2019). Mobile home residents are often first-time homebuyers or retirees living in the south and southwest regions of the United States with an average age trending towards older adults (Jovan & Joseph, 1997). Non-Hispanic whites make up about three quarters of heads of households in mobile home parks (Durst & Sullivan, 2019).

Seemingly the largest barrier to the broader use of manufactured housing as an affordable housing solution is the negative perception of manufactured housing units (and often the residents who reside there). A stigma of a "rural slum" exists for rural mobile home parks, as those who live there are still ridiculed as "trailer trash" (MacTavish, 2009). The stigma of trailer trash is unjustly fixed on low-income residents, with a connotation of poor physical appearance and that they exhibit unacceptable social behaviors (Beamish et al., 2001). This stigma can lead to exclusionary zoning practices (MacTavish, 2009). These perceptions can also lead to monetary effects, as research found that site-built dwellings located in closer proximity to manufactured housing have lower property values, all else being equal (Wubneh & Shen, 2004). However, in some communities double-wide manufactured homes can blend into a community so well that residents do not know it is different from a site-built single-family home (Beamish et al., 2001). While that doesn't help improve the image of manufactured housing, it illustrates that the stigma surrounding manufactured housing is often misplaced.

2.4. Affordability of Manufactured Housing

From 1993 to 1999 manufactured housing accounted for 23% of homeownership growth for low-income households (Apgar et al., 2002). Manufactured housing provides more affordability than conventional or rental housing stock when analyzed by total monthly housing costs, monthly housing costs per square foot, monthly housing costs as a share of household income, and monthly housing costs relative to local fair market rents (Durst & Sullivan, 2019). In fact, in 1994 the average cost per square foot for a manufactured home was 46% of the average cost of a site-built home (White, 1996). However, there are varying levels of affordability for manufactured housing based upon whether the home and land are both owned, the home is owned, and the land is rented, or both the land and home are rented. Owning a manufactured home and

the land beneath is the most affordable type of manufactured housing, otherwise a purchased manufactured home will be treated similarly to auto financing, needing to secure the purchase with a personal property loan or chattel loan (Durst & Sullivan, 2019; Apgar et al., 2002). Chattel loans often have higher interest rates and less favorable contract terms than a traditional mortgage (Apgar et al., 2002). However, manufactured housing renters, who rent both the home and land, with an average housing cost of $700 per month, have higher costs than either form of manufactured housing ownership ($670 for owners/land renters and $530 for owners of both) (Durst & Sullivan, 2019). In comparison to conventional housing stock where owners pay approximately $1,300 per month and renters pay $1,000 per month in housing costs, the cost saving of a manufactured home is still substantial (Durst & Sullivan, 2019). While ownership of both the land and manufactured home may be more expensive on the outset than just owning the manufactured home with the total average sales price ranging from $93,551 to $82,500, rather than from $51,409 - $29,689, land and homeownership for manufactured housing is a better investment as it provides greater long-term affordability, especially when compared to the total sales price of a similar site built home at $144,000 (NAHB Research Center, Inc., 1998).

Manufactured housing also provides higher quality housing stock than traditional rented homes, and at a lower cost than conventional ownership (Boehm, 1995). Manufactured housing is perceived similarly in structural quality to traditional housing (owned and rented) and provides an advantage due to the low cost and perception of high structural integrity (Boehm, 1995; Dawkins & Koebel, 2009). Manufactured housing can also provide an affordable and available housing option for those looking to provide their families with stability (MacTavish, 2009). Household mobility rates show that conventional renters are twice as likely to move as those with similar

income who own manufactured housing (Boehm, 1995). Overall, manufactured housing can provide affordability, stability, and quality housing for low-income communities.

2.5. Racial Disparities in Manufactured Housing Occupancy

Communities of color disproportionately represent low-income communities, and because manufactured housing is a more affordable housing option, an expectation would be that there would be more people of color residing in mobile homes. In 2017 the estimated median income of black households was $38,183, while Native Americans and Latinx had median incomes of $40,315 and $46,627, respectively; this is substantially lower than the $63,256 estimated median income of white households (U.S. Census Bureau, 2017). In addition, in 2017 the estimated percentage of white households below the poverty line was 10.2%, far lower than the estimated percentage below the poverty line for Native American, Black, and Hispanic/Latinx households which was 26.7%, 25.1%, and 22.1%, respectively. (U.S. Census Bureau, 2017).

Manufactured housing is an affordable housing option for low-income communities; therefore, an expectation would be to anticipate that a greater share of households of color would reside in manufactured housing. In 1976 an expected occupancy level for black households in mobile homes was generated for African Americans based on demographic variables that could affect the probability of living in a mobile home, as African Americans had lower income-levels in comparison to whites, and poorer housing conditions (Smith, 1976). Due to these circumstances black households were expected to have relatively high mobile home occupancy rate (Smith, 1976). However, when calculated in 12 southern states the actual occupancy rate ranged from 4 - 45% of expected levels (Smith, 1976).

Through analysis of geographic locations of mobile homes, Boehm (1995) found that minorities do not choose manufactured housing based on location, but instead on where their

family and friends live. If minority populations do move, 82.2% choose to remain in the central city, which provides less opportunity to move to a mobile home park, which are usually located in suburban or rural areas (Boehm, 1995). This phenomenon may be due in part to a migration of 58% of the black population from the rural south to live in urban centers further north occurred from 1950-1970 (Massey and Denton, 1988). In opposition, the white population within the same timeframe moved further out of the urban center into suburbs (Massey and Denton, 1988). Manufactured housing is considered to be mostly rural, while communities of color usually reside in mostly urban areas. In rural areas manufactured housing is predominant, with twice the national rate of manufactured housing (George and Barr, 2005). The lack of communities of color in rural areas may contribute to the racial disparity in manufactured housing.

Racial disparities in manufactured housing may be linked to the absence of communities of color in specific geographic division locations. Black, Latinx, and Native American populations may be more likely to reside in manufactured housing in different regions of the county. From 1950 to 1970 Latinx communities moved from rural areas to urban metropolitan areas in the Southwest and Midwest (Massey and Denton, 1988). In addition, 9 out of 10 rural black households live in the South, where manufactured housing is more customary (George and Barr, 2005). Rural pockets of poverty that disproportionally comprise communities of color can be found in certain geographic areas across the United States, such as African Americans in the south, Latinx in the Rio Grande Valley and border states, and Native American reservations in the Great Plains and Southwest (Lichter and Johnson, 2007).

Black, Latinx, and Native American manufactured housing residents are younger entry-level residents and utilize manufactured housing as a means of affordability, whereas white manufactured housing residents are typically older retirees who select manufactured housing by

choice. The majority of manufactured housing residents are younger or older than residents in the traditional site-built housing (Apgar et al., 2002). While low-costs and easy entry for a first time resident assist younger populations looking to get by with limited income, older generations choose manufactured housing as they may be less concerned with a lack of equity build up from land ownership and prefer to liquidate their assets for other needs (Apgar et al., 2002). As white residents are more likely to build equity throughout their lifetime, they are more likely to comprise the older generation who choose to live in manufactured housing, adding to the racial disparity.

2.6. Conclusion

A weak housing market created by the foreclosure crisis, has increased renters and decreased homeownership levels while increasing unaffordable housing units through low wages, a shortage of affordable rental homes, racial inequities, and wage inequality (Aurand et al., 2019; Joint Center for Housing Studies of Harvard University, 2017). Communities of color are more likely to be renters than whites and have also historically been restricted from homeownership through racial and economic zoning and redlining, contributing to the racial wealth and homeownership gap that is still present today (Rothstein, 2017; Gyourko et al., 1999; Boehm & Schlottmann, 2004). A potential solution to the affordable housing crisis that is disproportionately affecting communities of color would be access to more affordable housing units, such as manufactured housing. Manufactured housing is an affordable housing option for low-income communities; however, the majority of manufactured housing residents are white (Durst & Sullivan, 2019). African American, Latinx, and Native American communities are a larger representation of low-income populations, so why are there not a greater proportion of African American, Latinx, and Native American residents residing in manufactured housing? How can

policy promote access to this affordable housing option in communities of color? The next chapter describes the research framework and chosen data sources, methods and measurements used to address these questions.

Chapter 3: Methods, Data Sources, and Measurement

Historically Black, Latinx, and Native American populations have been racially discriminated against when attempting to access housing (Turner & Ross, 2003; Rothstein, 2017; Gyourko et al., 1999; Boehm & Schlottmann, 2004). The Fair Housing Act of 1968 outlaws acts of outright discrimination regarding housing, however generational wealth gaps and inaccessibility to affordable housing affects communities of color still today (Turner & Ross, 2003; Rothstein, 2017; Gyourko et al., 1999; Boehm & Schlottmann, 2004). The affordability crisis affects low-income populations, which are disproportionately made up of people of color, illustrating a need for greater access to affordable housing (Aurand et al., 2019; U.S. Census Bureau, 2017). Manufactured housing is one of the most affordable housing options for low-income populations, the question remains why more people of color do not reside in manufactured housing (Durst & Sullivan, 2019). This study proposes to identify potential factors that might contribute to the racial/ethnic disparity among manufactured housing residents.

This project consists of two research questions:

- Research Question #1: Manufactured housing is an affordable housing option for low-income communities; however, the majority of manufactured housing residents are white. As African American, Latinx, and Native American communities are a larger representation of low-income populations, why are there not a greater proportion of African American, Latinx, and Native American residents residing in manufactured housing?
- Research Question #2: How can policy promote access to this affordable housing option in communities of color?

This chapter describes the site selection, data source, unit of analysis, and analytical methods used in this study.

3.1. Data Sources and Site Selection

Data used in this study were acquired from the Integrated Public Use Microdata Series (IPUMS) National Historic Geographic Information System (NHGIS) database (Manson et al., 2019), including county-level estimates of household data from the 2013-2017 American Community Survey 5-Year Estimates and county-level estimate of population data from the 2010 U.S. decennial census. These data are derived from a 5% sample of the population. The county level was chosen initially as the unit of observation in order to ensure that it would be large enough avoid the selection of geographies comprised entirely of Non-Hispanic Whites. In addition, the county level would have smaller sampling errors than census tracts due to larger populations. The larger geography of counties, as opposed to tracts, would also allow for more easily interpreted maps at the national scale. There were initially 3,222 observations (i.e., 3,222 counties), with 5 observations lost in data processing; this resulted in a total of 3,218 total observations.

The total Black occupied housing map, shown in Figure 1, shows that the majority of the counties in the continental U.S. have less than 5,000 Black occupied households, and that counties that do hold more than 5,000 Black households are often congregated together and/or are near urban areas. The county with the largest number of Black households is Cook County, which holds the City of Chicago. While California (near L.A.) and the Northeastern region (New York City) contain small pockets of Black households, the region that has the largest collection of counties with more Black households is the South (North Carolina, South Carolina, Florida, Georgia, Alabama, Mississippi).

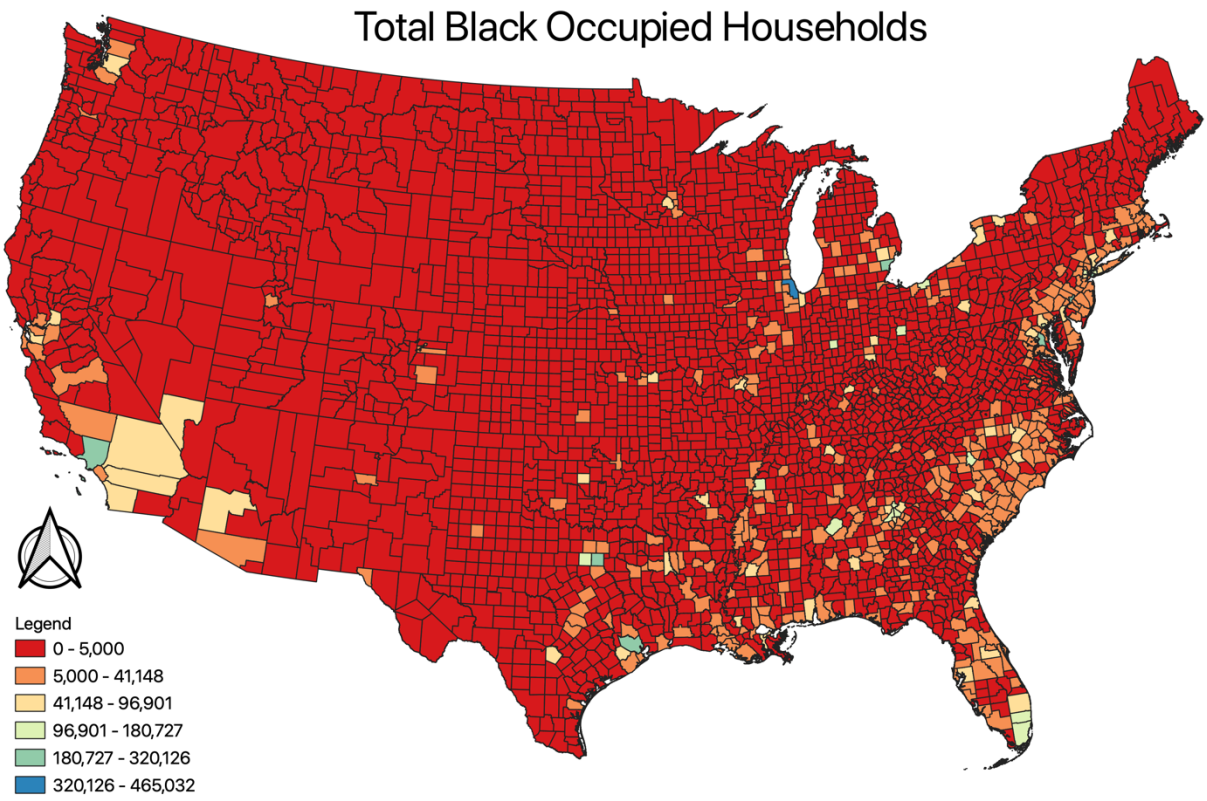

Figure 1: Total Black Occupied Housing Map

The total Native American occupied housing map, illustrated in Figure 2, shows that not only does the majority of the counties in the continental U.S. have less than 5,000 Native American occupied households, but overall in comparison to other races there is not a large number of Native American occupied housing. Counties that do contain more than 5,000 Native American households are often congregated together and/or are near urban areas. The region that has the largest collection of counties with more Native Americans households is the Southwest (California, Arizona, New Mexico). In addition, there is a region of Oklahoma and North Carolina where Native Americans reside in greater numbers due to tribal territory. Lastly larger urban areas, such as the counties that contain Seattle and Chicago, also have a large number of

Native American occupied housing units.

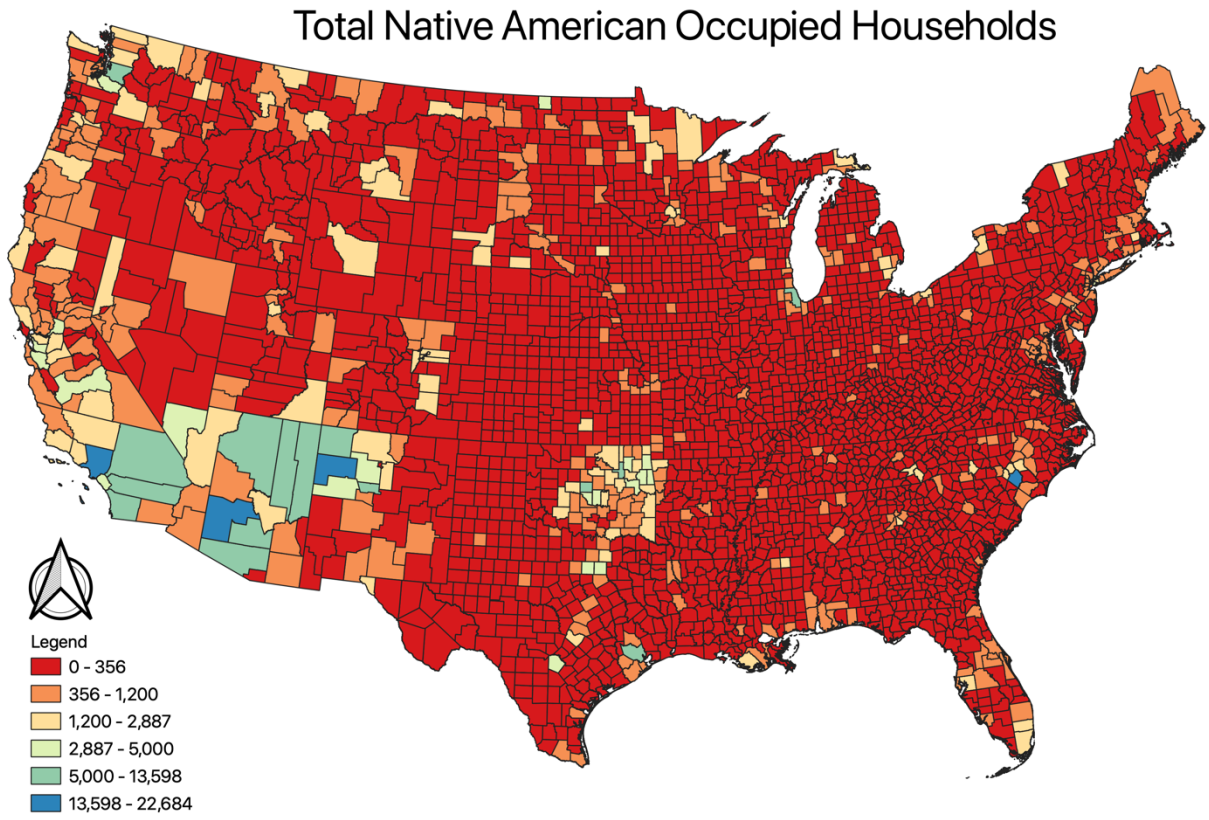

Figure 2: Total Native American Occupied Housing Map

The total Hispanic/Latinx occupied housing map, illustrated in Figure 3, shows that the majority of the counties in the continental U.S. have less than 5,000 Hispanic/Latinx occupied households, and that counties that do hold more than 5,000 Hispanic/Latinx households are congregated together, often along the U.S.-Mexico border and/or are near urban areas. The county with the largest number of Hispanic/Latinx households is Los Angeles County, which holds the City of Los Angeles. While Florida (near Miami) and the Northeastern region (New York City) contain areas of Hispanic/Latinx households, the region that has the largest collection of counties with more Hispanic/Latinx households is the Southwest (California, Arizona, New

Mexico and Texas).

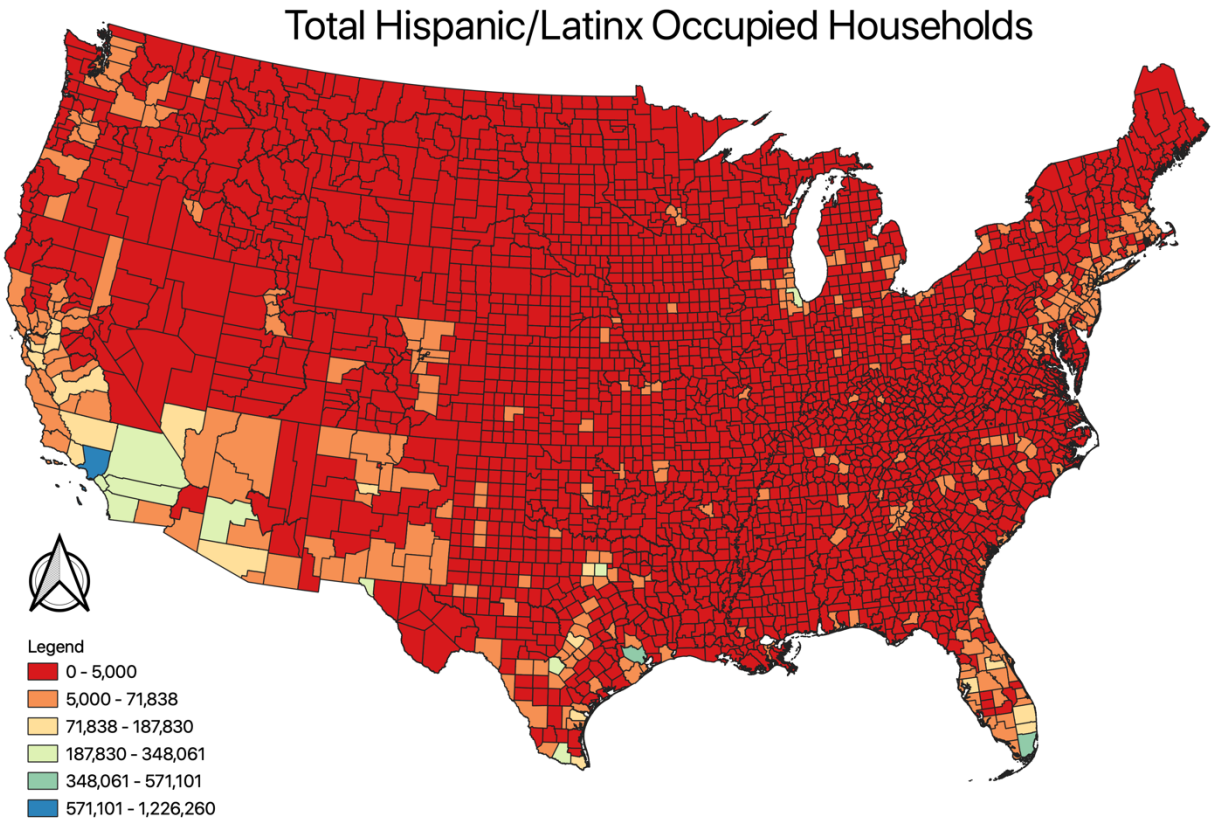

Figure 3: Total Hispanic/Latinx Occupied Housing Map

For brevity "White" will refer to Non-Hispanic Whites moving forward. Thus, the total White occupied housing map, illustrated in Figure 4, shows that the majority of the counties in the continental U.S. have over 5,000 White occupied households, with the exception of a strip of land that runs vertically throughout the plains, which encompasses parts of North Dakota, South Dakota, Nebraska, Kansas, Oklahoma and Texas. However, the break in White household representation could be due to the high amount of rural agriculture land, and thus low populations, in that region. Counties with the largest number of White households are usually near urban areas.

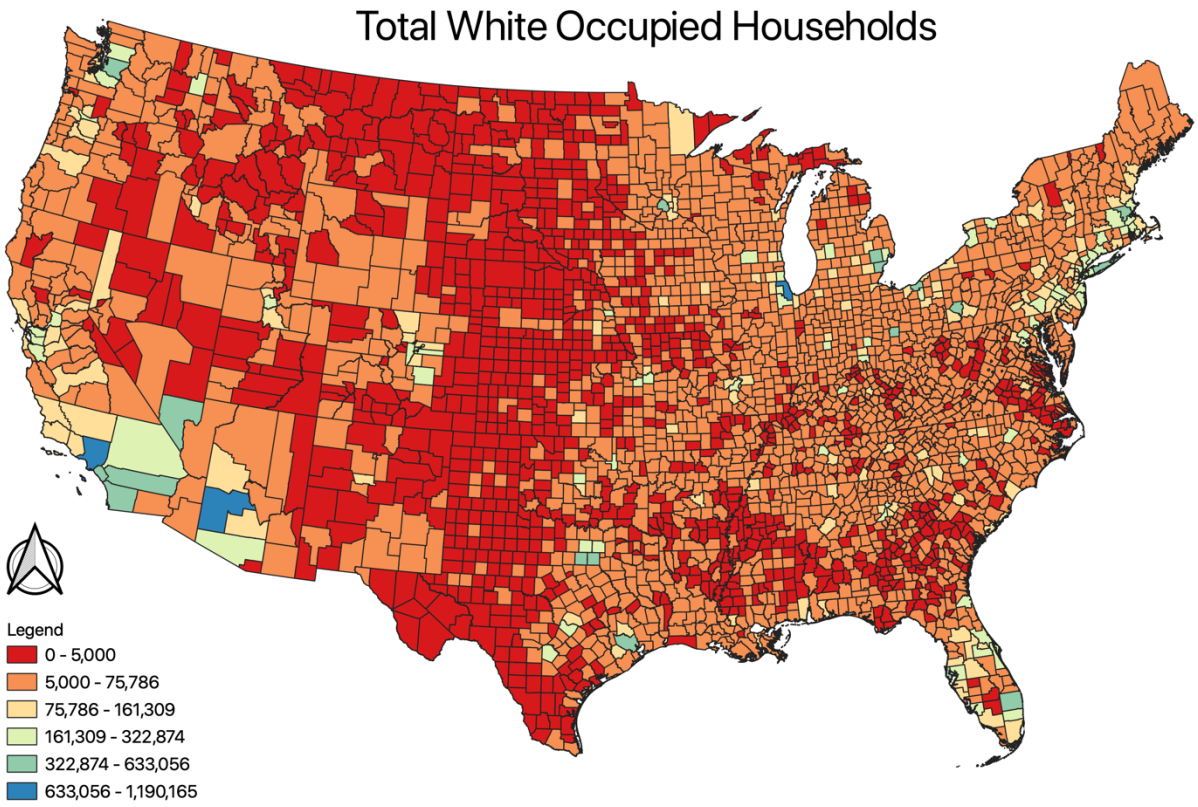

Figure 4: Total White Occupied Housing Map

Where people live is integral to understanding potential housing choices, in order to determine if mobile homes are a viable option for specific populations know it is also important to know where mobile homes are most prevalent across the country. Overall across the distribution of the percent of mobile homes, the counties where mobile homes are highest (from 32% - 59%) are in the regions of Appalachia, the South, and the Southwest. The higher amount of mobile homes in these areas could be attributed to the climate, as colder weather makes living in mobile homes potentially uncomfortable due to less insulation (Aman and Yarnal, 2010). Where mobile homes are least likely to make up a significant amount of the housing stock (0% - 7%) is throughout the Midwest, the Northeastern coast, and parts of California, Utah, and Colorado. Many of the areas where mobile homes are least likely also appear close to major

urban areas, such as New York City in the Northeast, Los Angeles in California, Metro Detroit and Chicago in the Midwest, as well as Denver and Salt Lake City in Colorado and Utah. However, there are many rural counties in the Midwest that still contain a low percentage of mobile homes, but again this could be attributed to the climate.

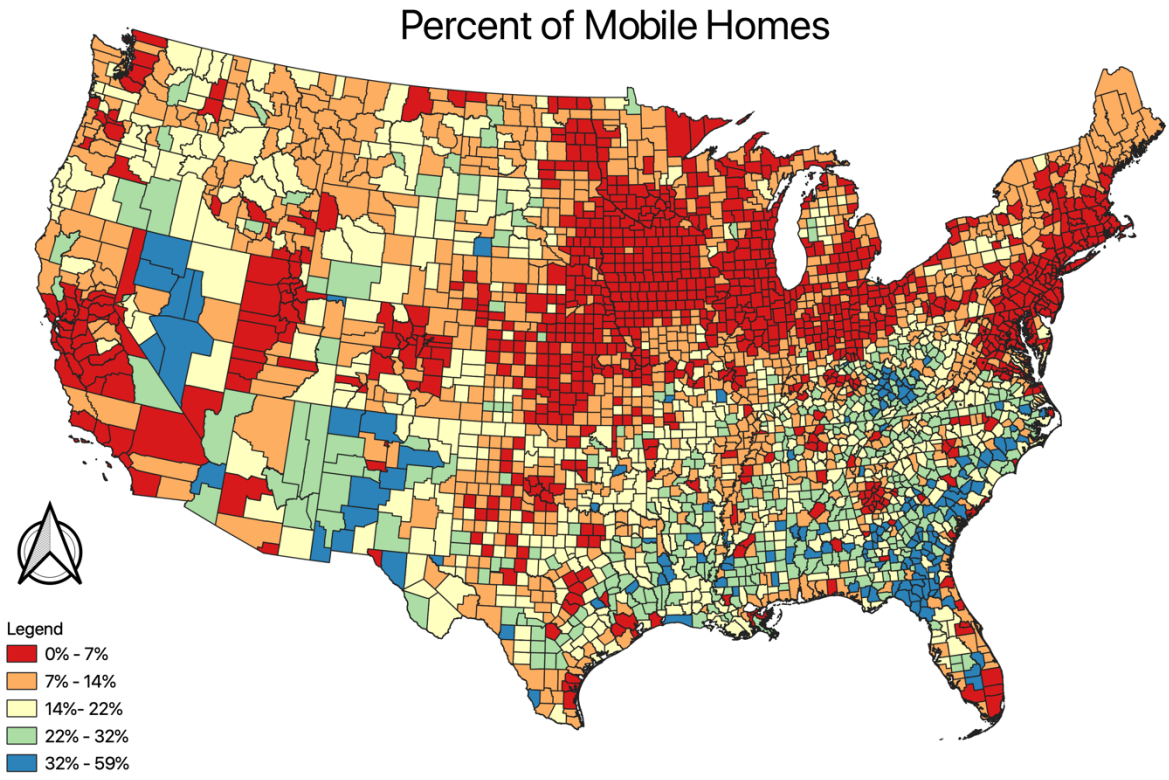

Figure 5: Map of the Percent Mobile Homes

To ensure that any trends identified were attributed to actual population characteristics and not merely sampling variation, counties were removed from the analysis if there were fewer than 5,000 households for the race/ethnicity in question. Limiting the sample to geographic units with a sufficient sample of a sub-population is a common practice in analyses of residential segregation; for example, prior scholars have limited their analyses to metropolitan areas with over 10,000 households, since estimations become less effective with too few households (Jargowsky, 1996;

Reardon and Bischoff, 2011). Since the unit of analysis within this study is counties, rather than metropolitan areas, the household limit was placed lower at 5,000 households. As the occupied households' maps illustrated, the counties with the greatest amount of people of color are found to be near urban centers (counties that represent all races are counties that include Los Angeles, Chicago, and Houston), while the amount of mobile homes is least likely near urban centers. This leads to a marked reduction in sample size after limiting the sample to counties with 5,000 households of each race. Of the 3,218 counties in the nation, 2,034 had more than 5,000 Non-Hispanic White households, 425 had more than 5,000 for Black households, 411 had more than 5,000 Latinx/Hispanic households, and only 21 counties had more than 5,000 for Native American households. Unfortunately, as the number of counties with 5,000 or more Native American households was so low, this hypothesis could not be tested. Asian Americans were also omitted from this study as on average the median income for Asian Americans is higher than Non-Hispanic White households. Therefore, only Black, Hispanic/Latinx, and (Non-Hispanic) White households were compared in analysis for the four hypotheses in this study.

3.2. Method: Ordinary Least Squares Regression

In the statistical data science software, Stata, Ordinary Least Squares (OLS) regression was used to examine and analyze the relationship between the racial disparity in mobile home occupancy and four variables of interest, as illustrated in the following model:

$$Y = \beta_0 + \beta_1 X_{1i} + \varepsilon_i$$

where Y, the dependent variable, is a measure of racial disparity in manufactured housing for Non-Hispanic White, Black, and Latinx households. X is a vector of independent variables representing the homeownership disparity for the racial or ethnic group in question, the percent of residents in the county residing in rural areas, the geographic division in which the county is

located, and the percentage of residents who are elderly (i.e., 65 years of age or older. *i* indicates the counties analyzed across the United States, and ε is the error term. Analyses of the model residuals confirmed that the regression assumptions, including the normality of residuals, were met. Tests for multicollinearity were also conducted and identified no problematic collinearity between the independent variables. Each of the variables included in the regression model, as well as the hypotheses tested via the regression model specified above, are discussed in Table 1. A description on how I calculated these variables follows. Any association between the dependent variable and the independent variables identified in this study do not necessary represent the causal effect of these factors on racial disparity in manufactured housing.

Table 1: Variable Descriptions

Categories	Variables	Definition	Data Source
Dependent Variable	Black Mobile Home Occupancy Index	Mobile Home Disparity for African Americans in each county	2013-2017 American Community Survey 5-Year Estimates
	Native American Mobile Home Occupancy Index	Mobile Home Disparity for Native Americans in each county	2013-2017 American Community Survey 5-Year Estimates
	Non-Hispanic White Mobile Home Occupancy Index	Mobile Home Disparity for the Non-Hispanic White population in each county	2013-2017 American Community Survey 5-Year Estimates
	Hispanic/Latino Mobile Home Occupancy Index	Mobile Home Disparity for the Hispanic/Latino population in each county	2013-2017 American Community Survey 5-Year Estimates
Independent Variables: Hypothesis 1	Black Homeownership Index	Homeownership disparity for African Americans in each county	2013-2017 American Community Survey 5-Year Estimates

Table 1 (cont'd)

	Non-Hispanic White Homeownership Index	Homeownership disparity for the Non-Hispanic White population in each county	2013-2017 American Community Survey 5-Year Estimates
	Hispanic/Latinx Homeownership Index	Homeownership disparity for the Hispanic/Latinx population in each county	2013-2017 American Community Survey 5-Year Estimates
Independent Variables: Hypothesis 2	Percent Rural	Percentage of rural area in 2010	2010 U.S. Census
Independent Variables: Hypothesis 3	Divisions	Census/ACS geographic divisions of the United States	2013-2017 American Community Survey 5-Year Estimates
Independent Variables: Hypothesis 4	Percent Elderly	Percentage of elderly who reside in mobile home units	2013-2017 American Community Survey 5-Year Estimates

3.3 Dependent Variable: Manufactured Housing Occupancy Index

The dependent variable in this study is the manufactured housing occupancy index for White, Black, and Latinx households. This is calculated, as illustrated in Equation 1 below, by subtracting the percentage of housing units in a county that are mobile homes from the percentage of a particular race that resides in mobile homes. Using 2013-2017 American Community Survey 5-Year Estimates at the county level the percentage of a race living in manufactured housing units was calculated by dividing the number of mobile homes occupied by a particular race by the total number of housing units that race occupies in the county. The percentage of total manufactured housing units in a county is calculated by dividing the number of mobile homes by the total number of housing units in the county. To offer greater flexibility for comparison each section of the population (a particular race or ethnicity) was compared to the population as a whole. (Race) will

be representative of one of the three race/ethnicities mentioned in the hypotheses (Black, Latinx, and White).

Equation 1: Manufactured Housing Occupancy Index

$$\left(\frac{\#(Race)Housing\ Units\ in\ MH}{\#(Race)County\ Housing\ Units} - \frac{\#MH\ Housing\ Units}{\#Housing\ Units}\right) = \text{Manufactured Housing Occupancy Index}$$

(%(Race) MH - %MH) = Manufactured Housing Occupancy Index

If Equation 1 produces a positive number, it illustrates that residents of the race or ethnicity in question are more likely to reside in manufactured than the average resident of the county (overrepresentation). However, if the equation produces a negative number, it indicates that residents of the race or ethnicity in question are less likely to reside in manufactured housing than the average resident of the county (underrepresentation).

3.4. Hypothesis #1. Homeownership Index.

The first hypothesis of this study is that Black, and Hispanic/Latinx are underrepresented in manufactured housing because they are underrepresented in homeownership in general. To illustrate underrepresentation for homeownership, a similar index is created. This is calculated, as illustrated in Equation 2 below, by subtracting the total homeownership rate from the homeownership rate of a particular race. Using 2013-2017 American Community Survey 5-Year Estimates data at the county level, the homeownership rate for a particular race was calculated by dividing the number of owner-occupied housing units of a particular race by the total number of housing units that race occupies in the county. The percentage of total homeownership in a county is calculated by dividing the number of owner-occupied housing units by the total number of housing units in the county. Please see Equation 2 below. (Race) will be representative of one of the three race/ethnicities mentioned in the hypotheses (Black, Latinx, and White).

Equation 2: Racial Homeownership Index

$$\left(\frac{\#(Race)Owner\ Occupied\ HU}{\#(Race)\ Housing\ Units} - \frac{\#Owner\ Occupied\ HU}{\#Housing\ Units}\right) = Racial\ Homeownership\ Index$$

(% (Race) Homeownership - % Total Homeownership) = Racial Homeownership Index

If the equation produces a positive number as a result, it indicates that residents of the race or ethnicity in question are more likely to be homeowners than the average resident of the county (overrepresentation). However, if the equation produces a negative result then residents of the race or ethnicity in question are less likely to be homeowners than the average resident of the county (underrepresentation). I hypothesize that the homeownership index by race will have a positive relationship with the manufactured housing occupancy index. Thus, disparities in homeownership may contribute to disparities in mobile home occupancy.

3.5. Hypothesis #2. Urban vs. Rural.

The second hypothesis in this study is that there may be fewer people of color residing in manufactured housing because manufactured housing is disproportionately rural, while communities of color disproportionately reside in urban areas. 2010 Census data will be used at the county level for this hypothesis, as the 2010 Census includes data on rural vs. urban units. The U.S. Census Bureau categorizes urban and rural areas as:

- Urbanized Areas – Population of 50,000 or more
- Urban Clusters –Population of at least 2,500 and less than 50,000
- Rural – Any population, housing or territory not in an urban area or urban cluster.

In order to calculate the percentage of people living in rural areas in the county, we divide the total number of people located in rural areas by the total number of people in each county

(urban area, urban cluster, and rural) and multiply by 100. For this hypothesis, I expect that people of color will be underrepresented in manufactured housing in more rural areas and overrepresented in more urban areas.

Equation 3: Percent Rural

$$\left(\frac{Rural\ Population}{Total\ County\ Population}\right) 100 = \%\ Rural$$

3.6. Hypothesis #3. Geographic Divisions.

The third hypothesis in this study is that there may be fewer people of color residing in manufactured housing because the under- or over-representation of Black and Hispanic/Latinx in manufactured housing may be contingent on the geographic division (i.e., region) of the country in which they reside. 2013-2017 American Community Survey 5-Year Estimates will be used at the county level for this hypothesis and compared across 9 divisions of the United States. The Census/ACS divisions are:

- 0. Puerto Rico
- 1. New England Division: Connecticut, Maine, Massachusetts, New Hampshire, Rhode Island, Vermont
- 2. Middle Atlantic Division: New Jersey, New York, Pennsylvania
- 3. East North Central Division: Illinois, Indiana, Michigan, Ohio, Wisconsin
- 4. West North Central Division: Iowa, Kansas, Minnesota, Missouri, Nebraska, North Dakota, South Dakota
- 5. South Atlantic Division: Delaware, District of Columbia, Florida, Georgia, Maryland, North Carolina, South Carolina, Virginia, West Virginia
- 6. East South Central Division: Alabama, Kentucky, Mississippi, Tennessee
- 7. West South Central Division: Arkansas, Louisiana, Oklahoma/Indian Territory, Texas

- 8. Mountain Division: Arizona, Colorado, Idaho, Montana, Nevada, New Mexico, Utah, Wyoming
- 9. Pacific Division: Alaska, California, Hawaii, Oregon, Washington

The manufactured housing occupancy index will be examined across each division to determine based on the disparity indices if there is an overrepresentation or underrepresentation for each race or ethnicity in each division. Once compared, I hypothesize that there will be an overrepresentation for the Black population in the South Atlantic Division and the Latinx population in the Mountain and West South Central Division.

3.7. Hypothesis #4. Age.

The fourth hypothesis in this study is that Black and Hispanic/Latinx manufactured housing residents may be younger, entry-level residents and utilize manufactured housing as a means of affordability, whereas white manufactured housing residents are older (retirees, snowbirds) who select manufactured housing by choice. 2013-2017 American Community Survey 5-Year Estimates will be used at the county level to measure the percentage of heads of household residing in mobile homes who are over 65 years of age, as illustrated in Equation 4[1]. I hypothesize that the Black and Latinx households will be over-represented in manufactured housing when mobile home residents are, on average, younger, while White households will be over-represented when mobile home residents are older.

Equation 4: Percent Elderly in Mobile Homes

$$\left(\frac{\#Mobile\ Home\ Occupied\ Householders\ 65+}{\#Mobile\ Home\ Occupied\ Householders\ All\ Ages\ (15+)}\right) 100 = \%\ Elderly\ in\ Mobile\ Homes$$

[1] A note should be made that the universe used to measure this by the ACS include mobile homes, recreational vehicles, and boats.

3.8. Conclusion

This chapter proposed potential factors that might contribute to the racial/ethnic disparity among manufactured housing residents. Data was analyzed using county-level estimates from the 2013-2017 American Community Survey 5-Year Estimates and the 2010 U.S. decennial census. Ordinary Least Squares (OLS) regression was used to examine the relationship between the mobile home occupancy index and four variables of interest: homeownership index, urban vs. rural area, geographic divisions, and age. The following chapter details the analysis of the data and holds a discussion on the results of the analysis.

Chapter 4: Results and Discussion

This chapter conducts an analysis of data from the ACS and decennial census in order to examine the potential factors that may contribute to racial disparities in manufactured housing occupancy. First, in order to visualize each hypothesis, this chapter begins with an analysis of descriptive statistics for each variable, histograms, and choropleth maps.[2] In the next section, scatterplots and linear regression is used to analyze the relationship between the dependent variable, racial disparity in manufactured housing, and the independent variables in each hypothesis.

4.1. Descriptive Statistics and Maps

Dependent Variable: Manufactured Housing Occupancy Index

Descriptive statistics for the dependent variable, manufactured housing occupancy index, are presented in Table 2. Only counties with greater than 5,000 households are summarized here. Comparing Black, Hispanic/Latinx and Non-Hispanic White mobile home occupancy index, more similarities appear than differences in the data. The mean for all races lies less than two points from zero disparity. Black and White households are on average slightly underrepresented in mobile homes, while Hispanic/Latinx are on average slightly overrepresented. Although White households are on average slightly underrepresented, the standard deviation shows that they are more likely to stay closer to zero disparity than Black households. Hispanic/Latinx also have a larger standard deviation, but due to their higher average disparity show a greater range in overrepresentation than Black or White households. This trend is also seen in the data for maximum values as Hispanic/Latinx households have the

[2] In order to show the greatest variation in trends, only the contiguous United States is shown in the maps.

highest amount of overrepresentation in mobile homes. Overall White mobile home disparity is more consistent than both the Black and Hispanic/Latinx mobile home disparities with a small average disparity, small standard deviation, and the minimum and maximum values with the lowest absolute magnitude. On average, however, the racial disparities in mobile home occupancy are lower in magnitude than anticipated. A complete set of descriptive statistics from the original data set of counties can be found in Appendix 1.

Table 2: Descriptive Statistics of the Dependent Variable

Variable	Observation	Mean	Std. Dev.	Min	Max
Black Mobile Home Occupancy Index	425	-1.699667	3.95422	-18.51678	23.03536
Hispanic/Latinx Mobile Home Occupancy Index	411	1.68749	4.359079	-14.22984	24.55885
Non-Hispanic White Mobile Home Occupancy Index	2,034	-.7786145	1.800471	-12.75989	16.22145

Initially looking at the Black Mobile Home Disparity map, three regions with the greatest underrepresentation stand out: The Southwest region, Appalachia, and Florida. However, looking back to Figure 1, the number of Black households in the counties for the Appalachian region are less than 5,000. Thus, from a sampling perspective, Florida and the Southwest region appear be the regions that have the most underrepresentation of Black households in mobile homes.

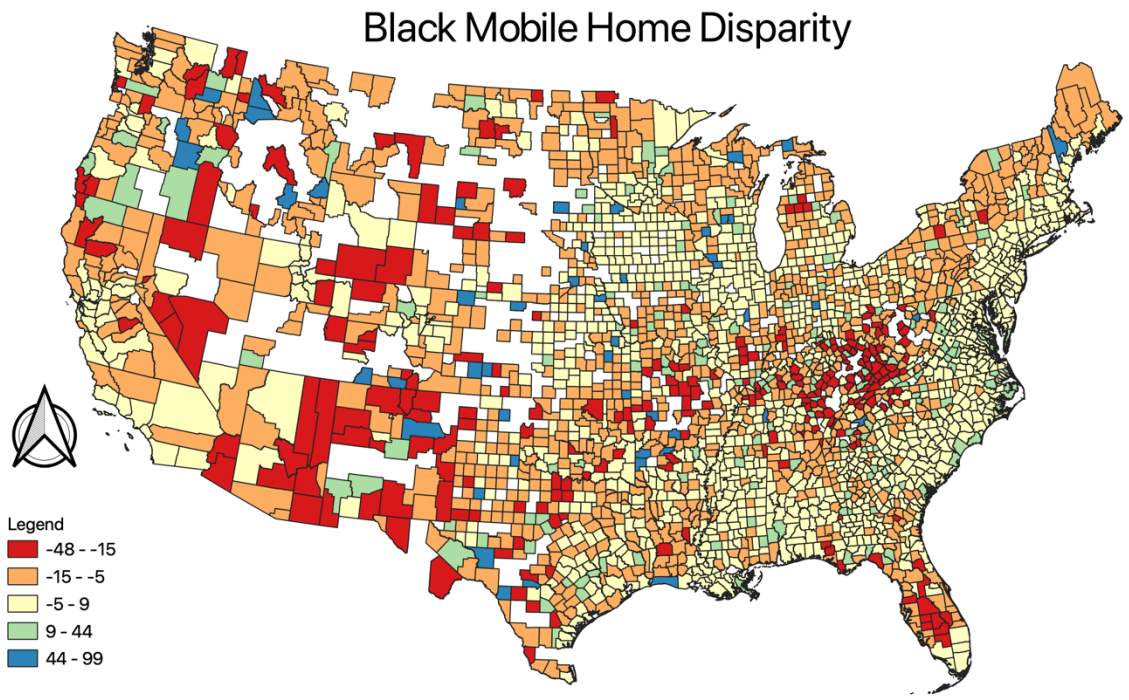

Figure 6: Black Mobile Home Disparity Map

The Hispanic/Latinx Mobile Home Disparity map shows three regions with the greatest underrepresentation: The Upper Mountain region, Appalachia, and the South. However, looking back at the Figure 3, the number of Hispanic/Latinx households in the counties for all three regions are less than 5,000. Thus, from a sampling perspective, no specific region can accurately account for underrepresentation or overrepresentation for Hispanic/Latinx households occupying mobile homes.

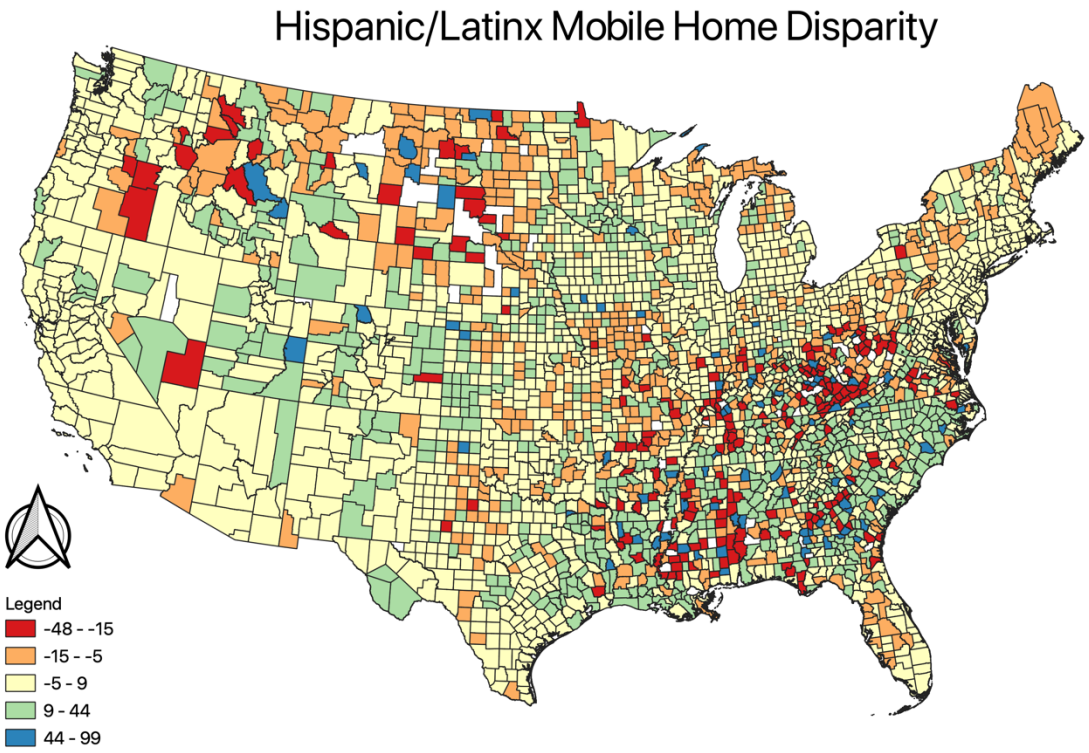

Figure 7: Hispanic/Latinx Mobile Home Disparity Map

Across the United States there are only a handful of counties that have a severe overrepresentation of Whites in mobile homes. In most of the country, White households have little to no disparity in their manufactured housing. Only three regions mildly stand out for underrepresentation across the country: The South, New Mexico, and the same vertical strip of land seen in Figure 4, that runs vertically throughout the plains, which encompasses parts of North Dakota, South Dakota, Nebraska, Kansas, Oklahoma and Texas. For the vertical strip, as less than 5,000 White households live in those areas, there is a likelihood that the underrepresentation is due to a sampling error. However, the South and New Mexico both appear to be the regions that have the most underrepresentation for White households occupying mobile homes.

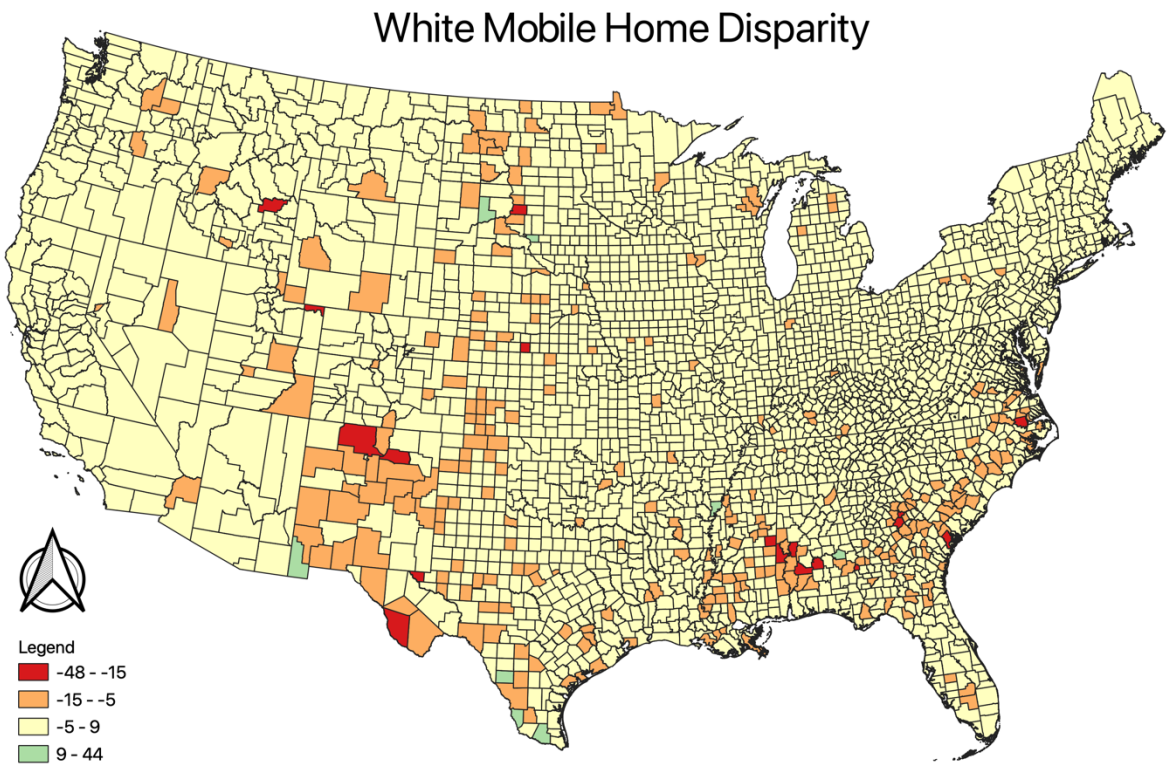

Figure 8: White Mobile Home Disparity Map

Overall looking at populated counties that are representative of each race, no large disparity trends occur within any race. Surprisingly Hispanic/Latinx households' trend toward overrepresentation, however this may be due to the overwhelming congregation of colonias and informal settlements in certain geographic regions (Durst and Wegmann, 2017). Black households have the greatest amount of underrepresentation of the three races, but White households show a similar trend of slight underrepresentation as well.

Hypothesis #1: Racial Disparity in Homeownership

I now turn to an analysis of the relationship between racial disparities in homeownership and the disparities in manufactured housing discussed above. As illustrated in Table 3, the Non-Hispanic White homeownership index has the highest mean, thus trending toward overrepresentation in homeownership, and also has the smallest standard deviation from the mean and the lowest magnitude minimum and maximum of the three races; this suggests that disparities in homeownership tend to be less extreme than for Black and Latinx households. In stark contrast, the Black and Hispanic/Latinx homeownership indices both have similar minimum and maximums, where at the worst there are counties with severe underrepresentation in homeownership for both races/ethnicities. The Black homeownership index, with a mean of -19.57, is more severe than the Hispanic/Latinx homeownership index (-12.92). This statistic, perhaps more than any other discussed in this study, highlights the systematic and longstanding inequality experienced by Black households in attempting to access the "American Dream" of homeownership. However, overall the homeownership disparity falls along racial divides with Whites represented in homeownership, while people of color are not.

Table 3: Descriptive Statistics of Independent Variables (Hypothesis 1)

Variable	Observation	Mean	Std. Dev.	Min	Max
Black Homeownership Index	425	-19.57773	11.07998	-44.42333	3.390099
Hispanic/Latinx Homeownership Index	411	-12.92472	10.20112	-43.03255	4.052277
Non-Hispanic White Homeownership Index	2,034	3.671718	3.63471	-9.340549	25.17353

Almost every county where Black households actually reside, as shown in the Figure 1, shows an underrepresentation in homeownership. While there are counties labeled as overrepresentation (9 - 44) across the Plains and Texas when comparing the Figure 1 to Figure 9, the areas where overrepresentation are shown are places where there are less than 5,000 Black households and thus these positive disparities are likely attributable to sampling error. The counties that are missing in white represent no Black households, yet despite a number of missing counties this map serves as a stark reminder of homeownership disparity for African Americans.

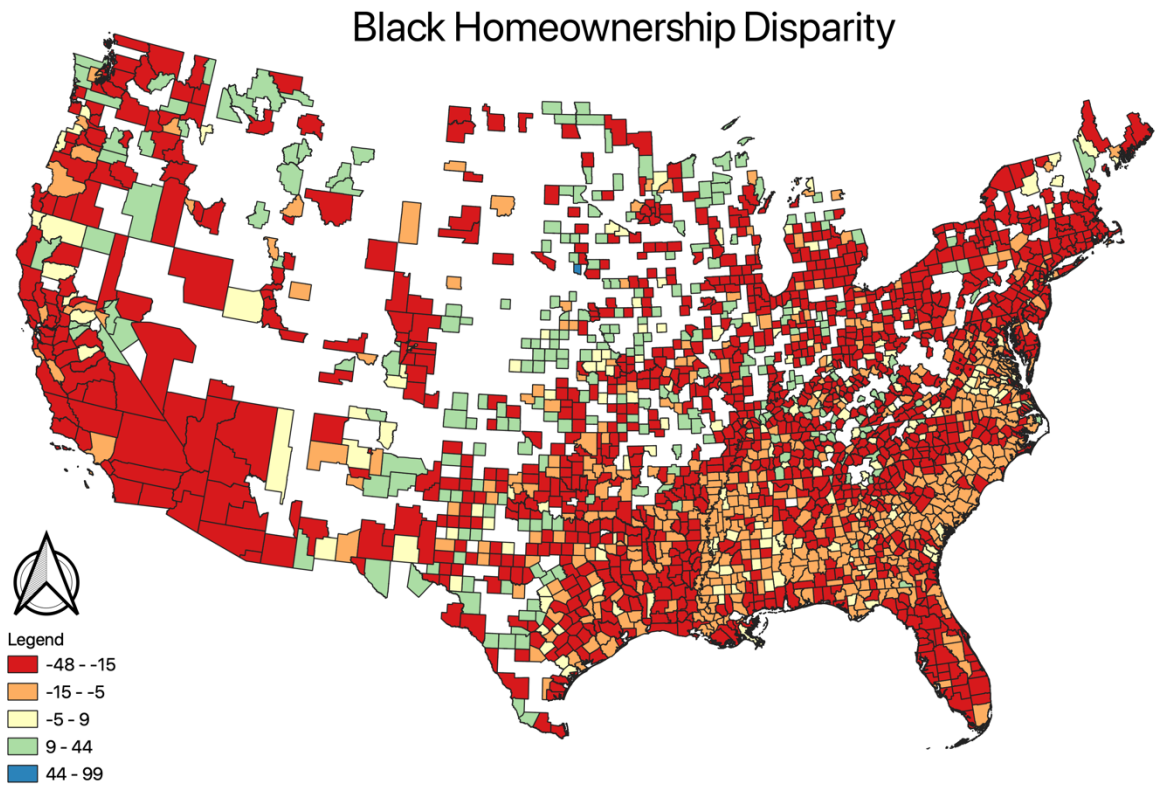

Figure 9: Black Homeownership Disparity Map

With the exception of New Mexico and Texas, in almost every county with more than 5,000 Hispanic/Latinx households, as shown in Figure 3, Hispanics/Latinx are underrepresented in homeownership. While there are counties labeled as overrepresentation (9 - 44) across the

Mountain region, Appalachia, and the South, as illustrated in Figure 10, the areas where overrepresentation are shown are places where there are less than 5,000 Hispanic/Latinx households and thus the estimates are potentially altered by a sampling error. The counties that are missing in white represent no Hispanic/Latinx households. This map illustrates a less severe homeownership disparity than for African Americans, yet still serves as an austere reminder of homeownership disparity for Hispanic/Latinx households in comparison to Whites.

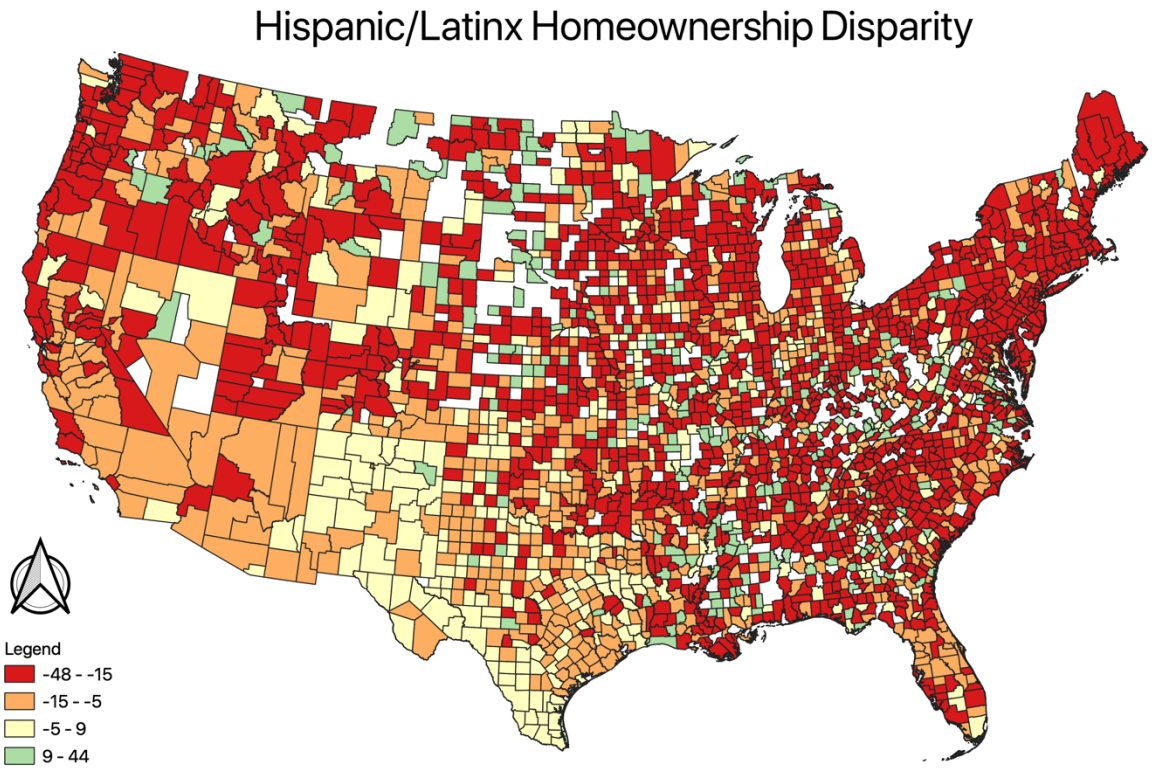

Figure 10: Hispanic/Latinx Homeownership Disparity

Across the United States there is little to no White homeownership disparity, and in comparison, provides a glaring contrast to both the Black and Hispanic/Latinx Homeownership Disparity maps, shown in Figures 9 and 10. While there are counties labeled as underrepresented (-48 - -15) in White homeownership in Texas and New Mexico, there is significantly more

overrepresentation (9 - 44) across the South, Northeast, and California, as illustrated in Figure 11. Overrepresentation also occurs in counties in the Midwest that have an urban center, such as Chicago, Detroit, and Cleveland.

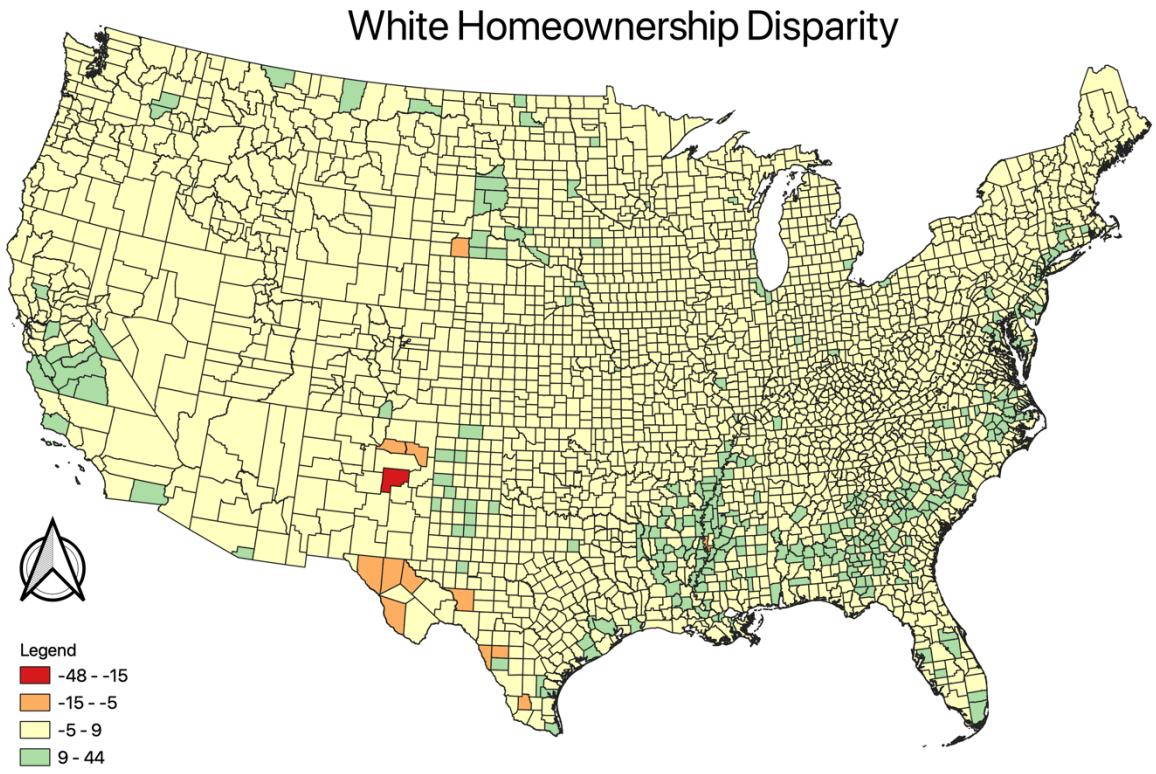

Figure 11: White Homeownership Disparity Map

Overall looking at populated counties that are representative of each race, large disparity trends occur within each race. Black households are severely underrepresented in homeownership, Hispanic/Latinx are underrepresented in homeownership, and White households are overrepresented in homeownership.

Hypothesis #2: Urban vs. Rural

As shown in Figure 12, most of the geographic area of the contiguous United States is 63% - 100% rural. The least rural areas are obviously mapped around metropolitan areas,

however most of Florida, California, and the Northeastern Atlantic Coast are also considered some of the least rural areas in the United States. The most rural areas in the country include portions of Appalachia and a large swath of land that runs vertically throughout the plains, which encompasses parts of North Dakota, South Dakota, Nebraska, Kansas, Oklahoma and Texas.

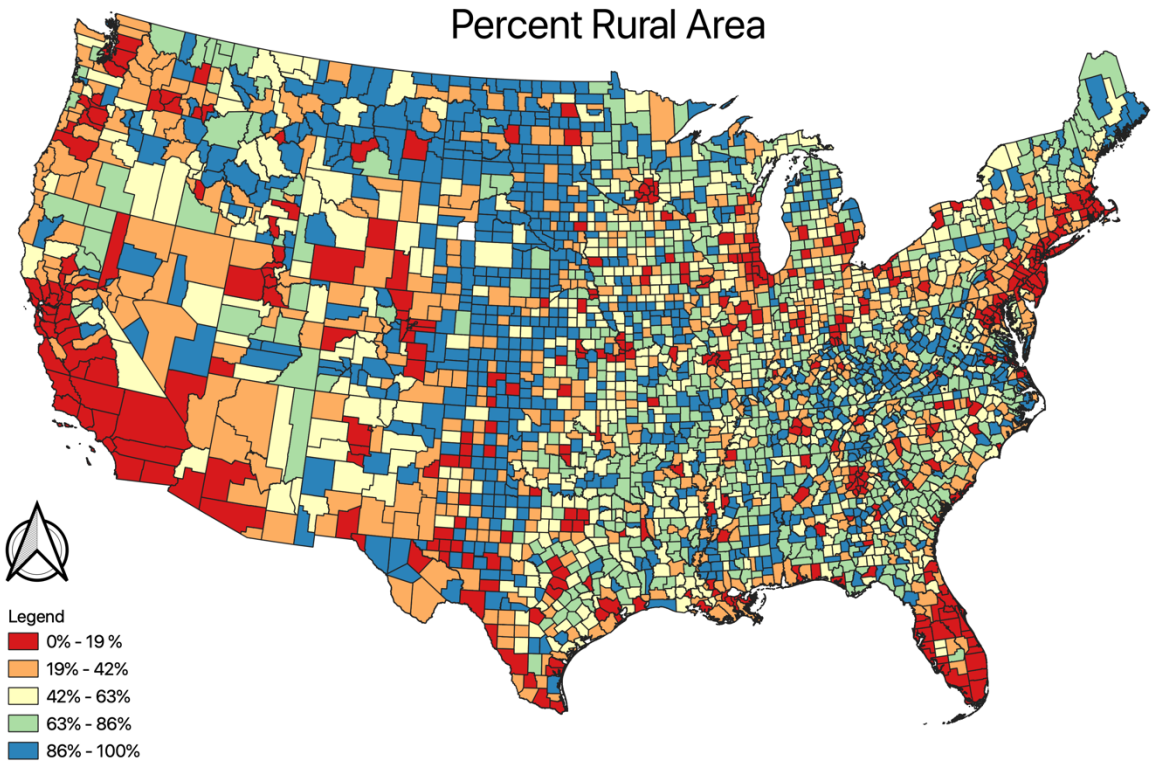

Figure 12: Percent Rural Map

Seen in Table 4, the descriptive statistics of the percent rural area in the United States illustrates that in the average county 57.52% of people are located in rural areas. Counties with over 5,000 White households are on average 47.03% rural. In addition, White households are more likely to reside in all areas (urban and rural), as the standard deviation illustrates a wide range of 27.67% around the mean. Both Black and Hispanic/Latinx are less likely to reside in rural areas than white households, as counties that have over 5,000 Black households are 19.95% rural, and

counties that have over 5,000 Hispanic/Latinx households are only 12.28% rural. Hispanic/Latinx households are less likely to reside in rural areas than Black households as the standard deviation illustrates the smallest range of 13.6% around the mean.

Table 4: Descriptive Statistics of Independent Variables (Hypothesis 2)

Variable	Observation	Mean	Std. Dev.	Min	Max
Percent Rural	3,221	57.52	32.04	0	100
Percent Rural - Black Counties > 5,000	428	19.95192	20.8144	0	100
Percent Rural - Hispanic/Latinx Counties > 5,000	414	12.28398	13.62221	0	100
Percent Rural – Non-Hispanic White Counties > 5,000	2,037	47.03191	27.67297	0	100

Hypothesis #3: Geographic Divisions

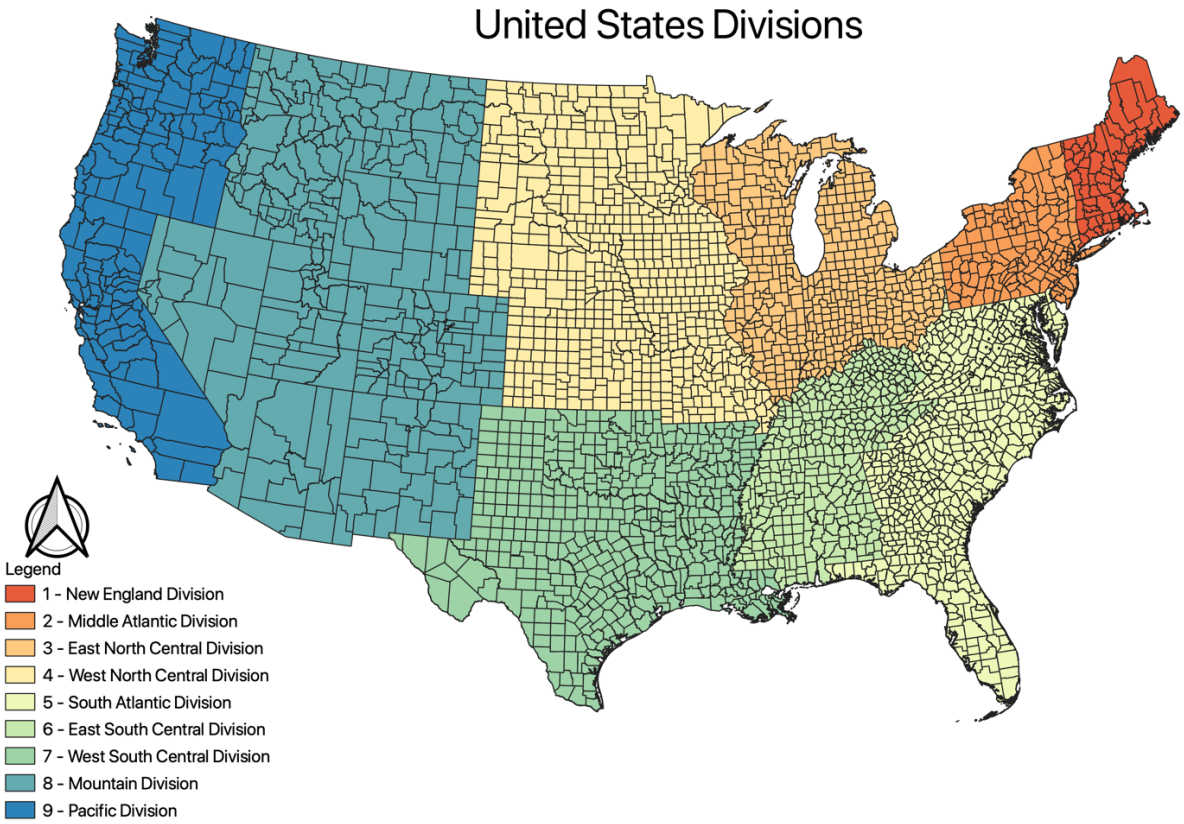

Figure 13: U.S. Geographic Divisions Map

The descriptive statistics of mobile home disparity across geographic divisions in the United States, as shown in Table 5, illustrate an average overrepresentation for Hispanic/Latinx households in divisions 3, 4, 5, 6, 7, 8, and 9. The division with the highest overrepresentation for Hispanic/Latinx households is the East South Central Division, which consists of Alabama, Kentucky, Mississippi, Tennessee. An underrepresentation in mobile homes for white households is present for all divisions, except New England where a small overrepresentation occurs. The most prevalent divisions for underrepresentation for white households were West South Central Division, Mountain Division, and Pacific Division. However, Black households on average represent underrepresentation in mobile homes across all divisions. Underrepresentation is seen to be most prevalent on average in the East South Central, West South Central, Mountain, and Pacific Divisions for Black households.

Table 5: Descriptive Statistics of Independent Variables (Hypothesis 3)

Division	Mean for Divisions - Black Counties > 5,000	Mean for Divisions – Hispanic/Latinx Counties > 5,000	Mean for Divisions – Non-Hispanic White Counties > 5,000
0 (Puerto Rico)	-.0219911	-.1601941	n/a
1 (New England)	-.7201476	-.6357596	.5530777
2 (Middle Atlantic)	-1.085876	-.0116713	-.2528365
3 (East North Central)	-1.70696	1.516015	-.7156097
4 (West North Central)	-1.117992	3.327284	-.8694399
5 (South Atlantic)	-1.355634	2.342616	-.8351095
6 (East South Central)	-2.354945	6.348653	-.74642947
7 (West South Central)	-2.840976	2.782024	-1.747902
8 (Mountain)	-2.634012	3.727328	-1.747902
9 (Pacific)	-2.226438	1.24861	-.1703135

As shown in both Table 5 and Figure 14, analyzing the frequency of mobile home disparity broken down by U.S. Census designated geographic regions, depending on a specific race, certain regions are shown to have greater mobile home disparity than others. For African Americans the largest amount of underrepresentation for mobile homes is in the South Atlantic Division, which

includes Delaware, District of Columbia, Florida, Georgia, Maryland, North Carolina, South Carolina, Virginia, West Virginia. This finding contradicts the initial hypothesis that Black households would be overrepresented in the South Atlantic Division. Smaller amounts of underrepresentation for Black mobile home disparity can also be found in the East and West South Central Divisions, which includes Alabama, Kentucky, Mississippi, Tennessee, Arkansas, Louisiana, Oklahoma/Indian Territory, and Texas.

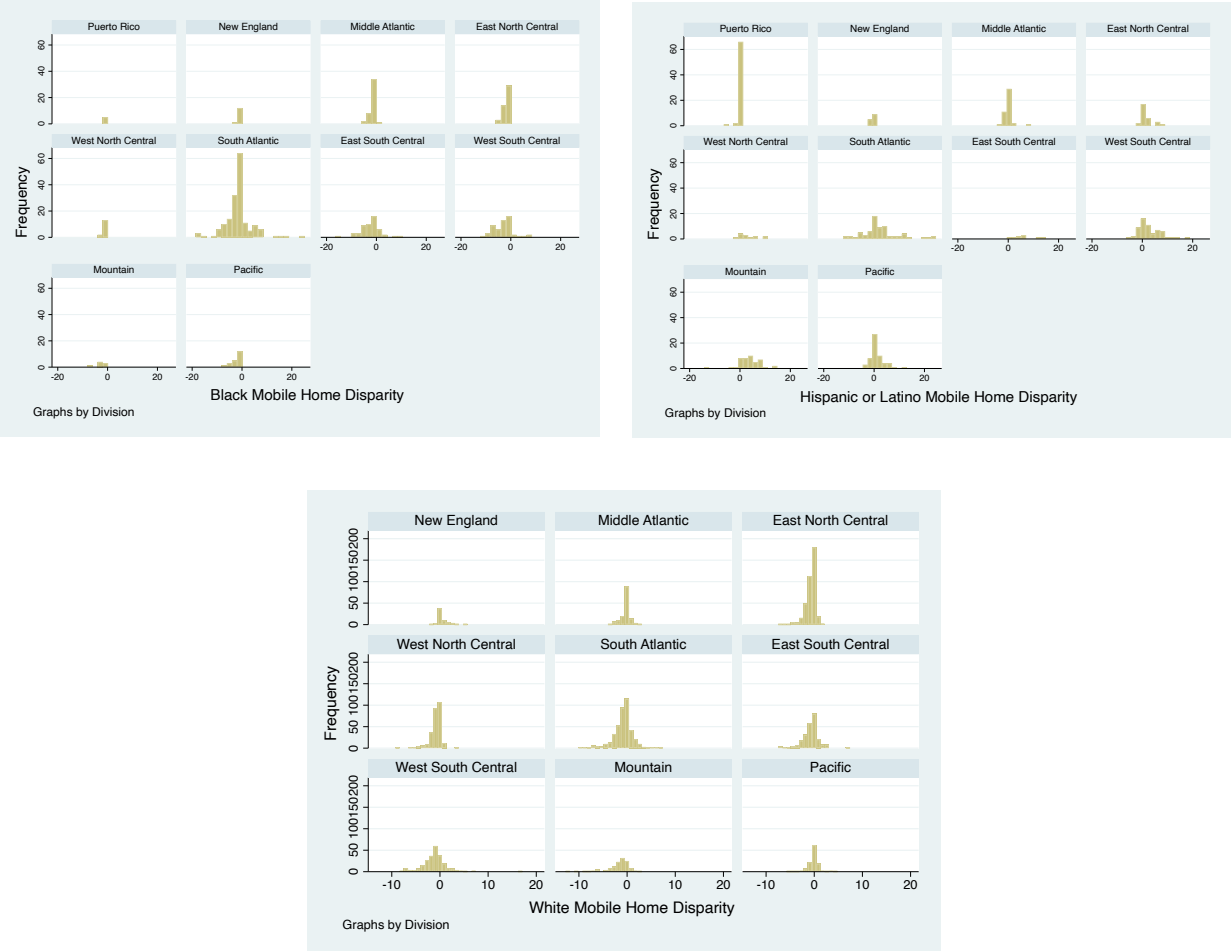

Figure 14: Black, Hispanic/Latinx, and White Mobile Home Disparity by Geographic Division Histogram

Hypothesis #4: Age

In Figure 15, most of the contiguous United States is broken up by geographic sections based upon the percent elderly in mobile homes. The areas with the highest percentage of elderly living in mobile homes is most of Florida, the West Coast, Arizona, and the Northeast Coast. Florida and Arizona are both known to invite the retirement community, so this result is not surprising. The lowest percentage of elderly in mobile homes in the country fall along a strip of land that runs vertically throughout the plains, which encompasses parts of North Dakota, South Dakota, Nebraska, Kansas, Oklahoma and Texas. However, as that area is less populated than the rest of the country, there is a likelihood that the low percentage is due to a sampling error. Across Appalachia and the South mobile home residents are 14% - 24% elderly, which illustrates that most mobile home residents in this region are younger than 65.

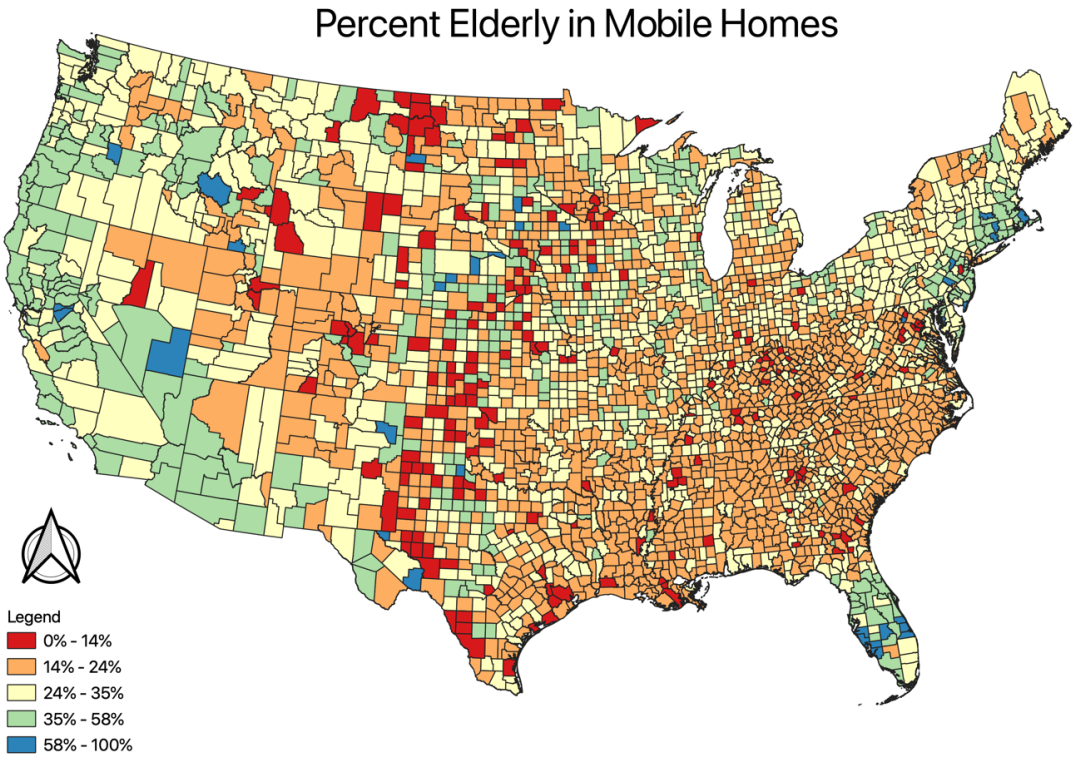

Figure 15: Percent Elderly in Mobile Homes Map

The descriptive statistics of the percent elderly in mobile homes in the United States, as shown in Table 6, illustrates that on average across the country only 25.7% of mobile home householders are elderly. Counties with over 5,000 White mobile home householders are on average 25.24% elderly. In addition, White mobile home householders are more likely to be younger, as the standard deviation illustrates a narrow range of 9.35% around the mean. Black mobile home householders are similar in age to White mobile home householders, in counties that have over 5,000 Black households as the average percent elderly in mobile homes is 24.28% but has a slightly higher age range with a standard deviation of 11.52%. Black and White mobile home householders are also similar in their maximums as Black mobile home householder percent elderly only reaches 74.82% and White percent mobile home householder elderly only reaches 77.03%. However Hispanic/Latinx mobile home householders in counties that have over 5,000 Hispanic/Latinx households have a higher percent of elderly in mobile homes, with an average of 30.47%, and a wider range of ages with a standard deviation of 19.32%. Hispanic/Latinx households also reach the 100% elderly mark in mobile homes for at least one county, and thus are typically older householders than Black or White mobile home householders.

Table 6: Descriptive Statistics of Independent Variables (Hypothesis 4)

Variable	Observation	Mean	Std. Dev.	Min	Max
Percent Elderly in MH	3,183	25.70974	11.51644	0	100
Percent Elderly in MH - Black Counties > 5,000	423	24.27723	11.00419	3.598485	74.82584
Percent Elderly in MH - Hispanic/Latinx Counties > 5,000	387	30.465444	19.32249	0	100
Percent Elderly in MH - White Counties > 5,000	2,030	25.24404	9.346565	0	77.03349

4.2. Regression Analysis

Next the relationships between the dependent variable, racial disparity in manufactured housing, and each independent variable for each race were analyzed using a linear regression model. The following model was estimated:

$$\mathbf{Y = \beta_0 + \beta_1 X_{1i} + \varepsilon_i}$$

where Y, the dependent variable, is a measure of racial disparity in manufactured housing. X is a vector of independent variables measuring the racial homeownership disparity, percent rural, geographic divisions, and percent elderly. i indicates the counties analyzed across the United States, and ε is the error term.

This regression model was applied to each hypothesis and the results are discussed moving forward. As shown in Table 7, the models have a relatively poor fit, as indicated by the r-squared; 20% of the variation in Hispanic/Latinx mobile home disparity can be explained by the regression model, about 18% of the variation in Black mobile home disparity can be explained by the regression model, and only 9% for white mobile home disparity.

Table 7: Linear Regression Results

	BlckMHD	LtxMHD	WteMHD
BlckHOD	0.128***		
	(0.03)		
LtxHOD		-0.0935**	
		(0.03)	
WteHOD			0.0294*
			(0.01)
PctRural	0.0182+	0.0485**	-0.0102***

Table 7 (cont'd)

	(0.01)	(0.02)	(0.00)
PctElderly	-0.0984***	-0.0662***	0.00900*
	(0.02)	(0.01)	(0.00)
Division 0 (Puerto Rico)	0	0	
	(.)	(.)	
Division 1 (New England)	3.818	-3.847*	0
	(2.41)	(1.66)	(.)
Division 2 (Middle Atlantic)	1.732	-3.264**	-0.900***
	(2.23)	(1.22)	(0.26)
Division 3 (East North Central)	1.554	-1.202	-1.171***
	(2.28)	(1.16)	(0.24)
Division 4 (West North Central)	1.526	0.108	-1.341***
	(2.42)	(1.46)	(0.25)
Division 5 (South Atlantic)	-0.578	-0.444	-1.401***
	(2.17)	(1.00)	(0.24)
Division 6 (East South Central)	-2.117	2.384	-1.111***
	(2.22)	(1.71)	(0.26)
Division 7 (West South Central)	-2.287	-0.19	-1.695***
	(2.22)	(0.94)	(0.25)
Division 8 (Mountain)	0.458	1.118	-2.406***
	(2.53)	(0.98)	(0.27)

Table 7 (cont'd)

Division 9 (Pacific)	1.025	-1.114	-0.992***
	(2.31)	(0.99)	(0.27)
_cons	3.025	2.642**	0.672*
	(2.17)	(0.86)	(0.30)
N	423	387	2030
R-sq	0.179	0.201	0.09

Notes: Standard errors in parentheses
+ p<.1, * p<0.05, ** p<0.01, *** p<0.001

Hypothesis #1: Racial Disparity in Homeownership

Overall the relationship between the homeownership index and the mobile home occupancy index across all races were found to have statistical significance but were substantively small. While the homeownership index illustrated high levels of underrepresentation for Black households, the mobile home occupancy index illustrated low levels of underrepresentation. There is a relatively weak positive relationship between the Black Mobile Home Occupancy Index and Black Homeownership Index; this is indicated by a coefficient of .128 (p<.001). A one percentage point increase in the Black Homeownership Index is associated with a .128 percentage point increase in the Black Mobile Home Occupancy Index. As seen in Figure 28, for African Americans a slight trend appears, showing that as the Black homeownership disparity decreases the Black mobile home disparity also decreases to zero disparity. As Black residents are more likely to be homeowners, they are also more likely to live in mobile homes.

As seen in Table 7, there is a weak negative relationship is between Hispanic/Latinx Mobile Home Occupancy Index and Hispanic/Latinx Homeownership Index, as indicated by a

coefficient of -0.0935 (p<.01). An increase of one percentage point in the Hispanic/Latinx Homeownership Index is associated with a 0.0935 percentage point decrease in the Hispanic/Latinx Mobile Home Occupancy. Essentially, as Hispanic/Latinx residents are more likely to be homeowners, they are less likely to live in mobile homes. This finding is somewhat counterintuitive, particularly given the abundance of mobile home in predominantly Latinx colonias along the U.S.-Mexico border.

Lastly, for white households a weak positive relationship between the homeownership index and mobile home occupancy index was significant at the p<.05 level with a coefficient of 0.0294. Therefore, a one percentage point increase in the White Homeownership Index is associated with a .0294 percentage point increase in the White Mobile Home Occupancy Index. As Figure 16 illustrates, as White residents become homeowners, they are more likely to reside in mobile homes.

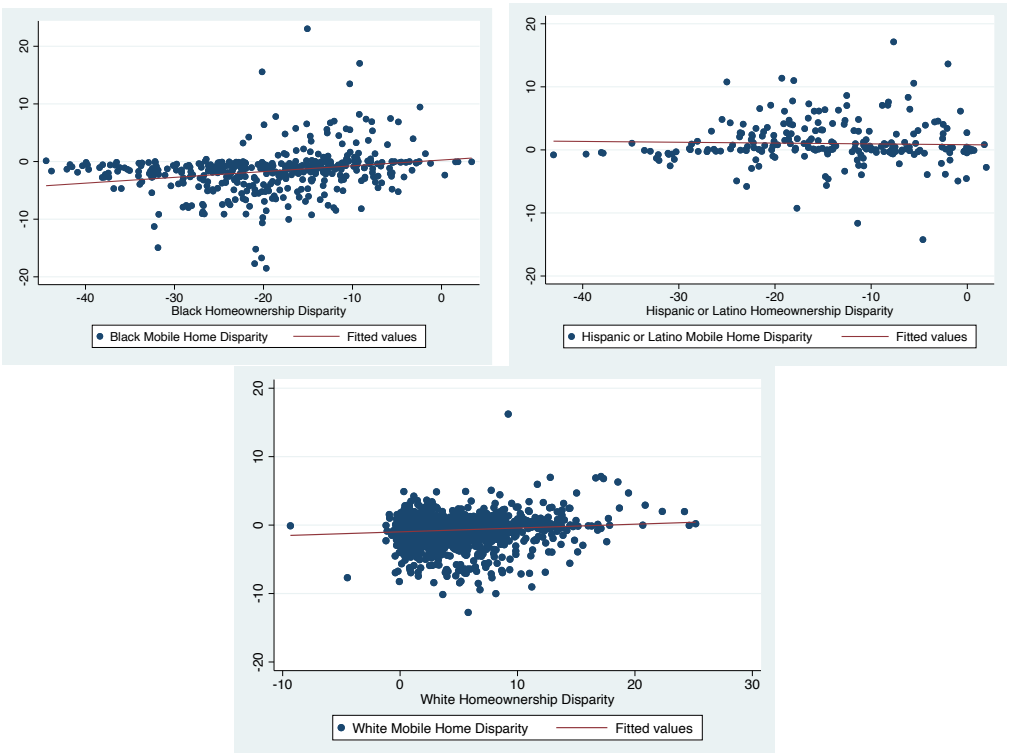

Figure 16: Black, Hispanic/Latinx, and White Mobile Home and Homeownership Disparity Scatter Plot

Overall looking at the three races' coefficients, Black and white households are more likely to reside in mobile home as they become homeowners, with Black households more likely than whites. However, Hispanic/Latinx households are the opposite with a small margin illustrating that as they become homeowners, they are less likely to reside in mobile homes.

Hypothesis #2: Urban vs. Rural

The relationship between the percent rural and mobile homes occupancy index for Hispanic/Latinx and White households was found to be significant at the $p<.01$ level with a coefficient of 0.0485 and at the $p<.001$ level with a coefficient of -0.0102, respectively. Therefore, for Hispanic/Latinx a one percentage point increase in the Percent Rural is associated with a .0485 percentage point increase in the Hispanic/Latinx Mobile Home Occupancy Index and for Whites a with a .0102 percentage point decrease. In essence, when Hispanic/Latinx households are located rurally, they are more likely to reside in mobile homes. This was the opposite of the original hypothesis, as the literature indicates communities of color disproportionately live in urban areas. However, the increase in the percent rural potentially points to the emerging literature on colonias. White households were initially hypothesized to have greater representation rurally, thus why there was greater representation in mobile homes, however Figure 29 show a fairly even spread across urban and rural for white households, contradicting that part of the hypothesis. Although, one thing to keep in mind with this result is overall there are greater numbers rurally for white households.

For African Americans in Figure 29 a slight trend occurs as the percent rural area increases the Black mobile home occupancy index also decreases marginally to zero disparity indicating that Black households are slightly more likely to live in mobile homes when they

reside in rural areas. However, as indicated by the regression model in Table 7, this relationship is significant only at the .1 level.

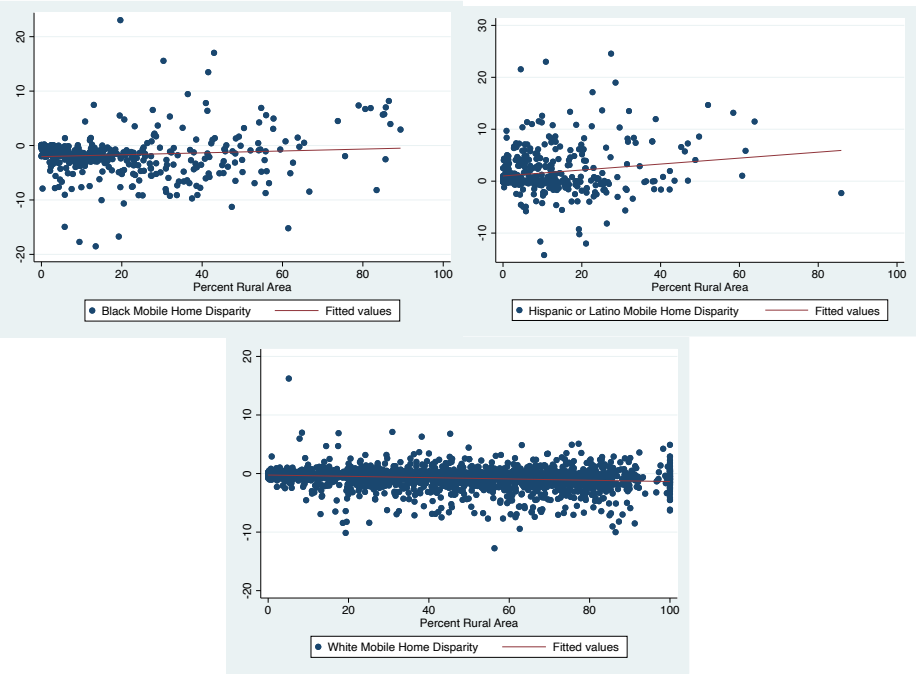

Figure 17: Black, Hispanic/Latinx, and White Mobile Home Disparity and Percent Rural Area Scatter Plot

Hypothesis #3: Geographic Divisions

Looking at the regression results for Hypothesis 3, for geographic divisions the coefficients for the divisions represents the average difference in mobile home occupancy index between each division and the reference category. The reference category is whichever division is omitted from the model. For Black and Hispanic/Latinx households the reference category is Division 0 (Puerto Rico) and for white households the reference category is Division 1 (New England) because there aren't enough white households in Puerto Rico to meet the 5,000 household threshold. Since coefficients are always compared with the reference category, statistical significance is not as important as the comparison of coefficients for each division to the reference category.

Across all races, the difference in coefficients is not very large with all coefficients falling within the range between -3 and 4, which suggests that the difference across divisions for racial disparity in manufactured housing are not very large either. The largest difference to note for Black households is present for Division 1 (New England) with a coefficient of 3.818, meaning that the disparity index in Division 1 is 3.8 percentage points higher than in Division 0 (Puerto Rico). For Hispanic/Latinx households for Division 1 (New England) and Division 2 (Middle Atlantic) with coefficients of -3.847, and -3.264, respectively. Therefore, the disparity index in Division 1 is 3.8 percentage points lower than Division 0, and the disparity index for Division 2 is 3.2 percentage points lower than Division 0. As there is a large representation of Hispanic/Latinx households in Puerto Rico, the larger difference between northern areas of the country are not surprising.

Hypothesis #4: Age

The relationships between the percent elderly in mobile homes and mobile home occupancy index across all races were found to be significant.

As the percentage of elderly Black mobile home householders increases, underrepresentation of Black householders in mobile homes grows as well. A weak negative relationship was found between Black Mobile Home Occupancy Index and the Percent Elderly in Mobile Homes and significant at the $p<.001$ level with a coefficient of -0.0984. A one percentage point increase in the Percent Elderly in Mobile Homes is associated with a .0984 percentage point decrease in the Black Mobile Home Occupancy Index.

A weak negative relationship exists between Hispanic/Latinx Mobile Home Occupancy Index and the Percent Elderly in Mobile Homes and was found significant at the $p<.001$ level with a coefficient of -0.0662. A one percentage point increase in the Percent Elderly in Mobile

Homes is associated with a decrease in the Hispanic/Latinx Mobile Home Occupancy Index by .0662 percentage points. Essentially, as illustrated in Figure 18, that as the percentage of elderly Hispanic/Latinx mobile home householders increases, underrepresentation of Hispanic/Latinx householders in mobile homes grows as well.

When analyzing the weak positive relationship of White Mobile Home Occupancy Index and the Percent Elderly in Mobile Homes significance was found at the $p<.05$ level with a coefficient of 0.009. A one percentage point increase in the Percent Elderly in Mobile Homes is associated with a .009 percentage point increase in the White Mobile Home Occupancy Index. However, while both Black and Hispanic/Latinx mobile home occupancy index illustrate an underrepresentation as the percent of elderly in mobile homes increases, no overrepresentation occurs for White mobile home disparity, as can be seen in Figure 18.

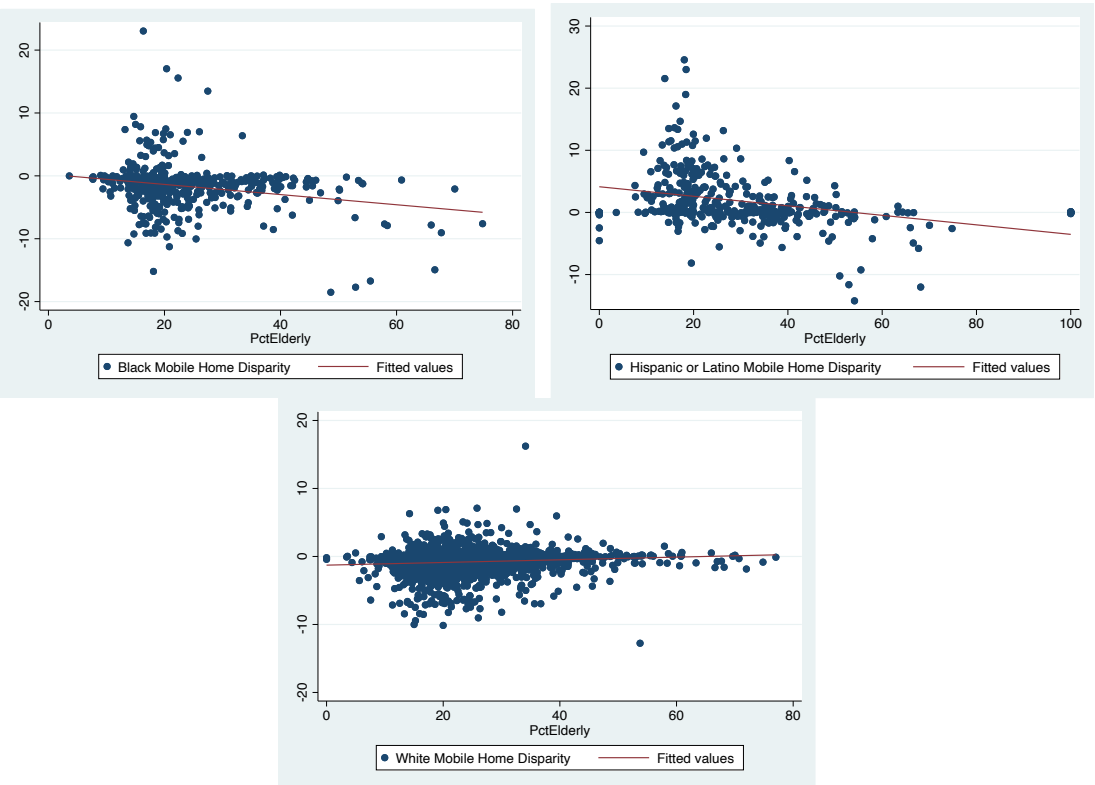

Figure 18: Black, Hispanic/Latinx, and White Mobile Home Disparity and Percent Elderly in Mobile Homes Scatter Plot

Chapter 5: Conclusion

5.1. Conclusion

This study was designed to examine racial disparities in the occupancy of mobile homes in the United States and to identify possible relationships that could explain these disparities. Mobile homes are one of the most affordable housing types for low-income populations in the United States (Durst and Sullivan, 2019). As people of color are more likely to be represented in low-income populations this study sought to understand why there were not more people of color residing in manufactured housing (U.S. Census Bureau, 2017).

I reviewed literature on the racial disparity of homeownership and manufactured housing, the affordability crisis, and the affordability of manufactured housing for low-income populations. With most of the literature focusing on the relation of homeownership, geographic location, and age to the likelihood of residing in a mobile home, these topics became the basis of the study's hypotheses. To examine their relationship with racial disparities in mobile home occupancy, 2013-2017 American Community Survey 5-Year Estimates and data from the 2010 U.S. decennial census were collected at the county level in the United States and analyzed using a linear regression model.

Despite finding several significant relationships between racial disparity in manufactured housing and the hypotheses for each race, none of the results had a substantively large relationship with the dependent variable. The most prominent takeaway from this study is the severity of the racial homeownership gap for Black and Hispanic/Latinx households in comparison to whites, and the need for policy and planning to address this disparity. As manufactured housing is an affordable homeownership option, it may provide a first step towards homeownership for people of color. Overall looking at the three races relationship between racial

mobile home disparity and racial homeownership disparity, Black and white households are more likely to reside in mobile home as they become homeowners, with Black households more likely than whites. However, Hispanic/Latinx households are the opposite with a small margin illustrating that as they become homeowners, they are less likely to reside in mobile homes.

When looking at the relationship between the racial mobile home disparity and the percent of people in rural areas, in essence, when Hispanic/Latinx households are located rurally, they are more likely to reside in mobile homes. Whereas, when white households are located rurally, they are less likely to reside in mobile homes. This was the opposite of the original hypothesis, as the literature indicates communities of color disproportionately live in urban areas. However, this suggests that mobile homes can provide an affordable housing option of communities of color residing in rural areas. Across all races for geographic divisions, the difference in coefficients were not very large, which suggests that the difference across divisions for racial disparity in manufactured housing were fairly small. Lastly, the relationship between racial disparity in manufactured housing and the percent elderly living in mobile homes shows that areas with a larger elderly population have underrepresentation of Black and Hispanic/Latinx households in mobile homes. This supports the original hypothesis, that people of color use mobile homes not as a retirement option, but as a means of entry into homeownership for affordability.

One of the most interesting findings in the analysis is that Hispanic/Latinx households, illustrate they are less likely to live in mobile homes as they become homeowners. While surprising, this finding may point to the building patterns of moving from a temporary dwelling unit, such as mobile homes, to completed self-built homes in colonias (Durst, 2015).

5.2. Implications and Policy Recommendations

While policies such as expanding national and local housing trust funds and providing a targeted renters' tax credit could be potential solutions to the affordability crisis, the addressing barriers to African American, Latinx, and Native American occupancy in manufactured housing is key to increasing affordable housing opportunities. One potential barrier for residency in mobile homes for communities of color is the perception of mobile homes. Throughout the history of the United States people of color have lost out on generational wealth and may look at the purchase of a home as a first step in upward economic mobility. A perception challenge facing manufactured housing is that many believe manufactured housing homeowners do not gain equity in their investment. However, for manufactured homes that are categorized as real estate rather than personal property the Federal Housing Finance Agency states that manufactured housing has seen price trends (appreciation) similar to traditional site-built housing (Russell & Johnson, 2018). However, to be categorized as real estate rather than personal property, the owner must own the land and the mobile home must be on a foundation (National Consumer Law Center, 2014). Mobile homes that are located in mobile home parks where the land is rented or were created for mobility and are expected to have greater amounts of physical depreciation are often considered personal property (Jewell, 2003). Encouraging policy that promotes the purchase of land to enable the title of real property, rather than renting in a mobile home park, would decrease risks associated with mobile homes, such as weaker consumer protections and home value depreciation (National Consumer Law Center, 2014). This policy shift could also create easier opportunities for communities of color to access traditional mortgage financing, as mobile home financing is often at a higher interest rate and a smaller time-frame window (National Consumer Law Center, 2014). Lastly, land ownership can help

prevent common issues plaguing mobile home parks when the land is sold to a developer, with residents unable to safely move their home, ultimately losing their home and investment. As Durst and Sullivan (2019) mention one method of implementation for this policy could be to focus on converting mobile home parks to small land ownership opportunities.

However, policies should also be conscious of the risks and exploitation that comes with land acquisition for low-income populations, often through the means of land contracts. Land contracts, or contract for deed, are a financing option for those who do not qualify for traditional financing where the buyer does not receive the title from the seller until the completion of all payment (Olmedo and Ward, 2016). The payments are often affordable and paid monthly but have high interest rates over the set time period, which may be decades (Olmedo and Ward, 2016). In order to protect the investment of low-income populations, policies like those enacted by Texas's state legislature in 2015 should be passed requiring the title to be given to the homebuyer for land contracts, as well as pushing for legal title recording to establish lawful ownership of the property (Diaz, 2015).

Another potential barrier for residency in mobile homes for communities of color is exclusionary zoning. Mobile homes are often zoned out of many residential areas due to the potential of unattractive mobile homes to decrease adjacent property values, however this legitimate reason accompanies a fear of lower-income populations moving to a municipality (Chernoff, 1983). Due to modern advances in manufactured housing there are current models that are indistinguishable from site-built construction homes. Therefore, zoning ordinances should be amended to allow for the placement of manufactured homes in residential areas, increasing the affordable housing stock in municipalities.

In addition, policies that advance representation of people of color as homeowners in general need to be advocated for. Both the maps and data found during the Black and Hispanic/Latinx homeownership disparity analysis, especially in comparison to the lack of disparity for White homeownership, illustrated a staggering racial homeownership gap. Policies such as strengthening anti-discrimination housing laws and encouraging innovative lending practices to engage people of color who may not qualify for a traditional loan while ensuring the sustainability of their loan protecting their investment of equity should be considered.

Although finding pathways for communities of color to move from renters to homeowners is a priority, making sure to maintain and improve the equity of current homeowners in communities of color is also key, as they are less likely to maintain the status of homeownership than their White counterparts (Haurin and Rosenthal, 2004). Providing continual access to housing counseling programs for people of color throughout homeownership would help provide a trusted resource to turn to when a trigger event occurs, such as loss of employment, divorce, or death. Another opportunity to improve the equity of homeowners of color is to invest further in neighborhoods of color where these homeowners reside, so they can get an equal return on investment as white homeowners. Land and its value are often intertwined with the amenities a location has to offer, so investing further in the well-being of the neighborhood, local businesses, parks, and schools could play an integral part (Jewell, 2003).

Lastly, as the mobile home disparity findings found that there was a slight overrepresentation for Hispanic/Latinx households in mobile homes, and that as the county became more rural there were more likely to be Hispanic/Latinx mobile home households, I conclude that this is potentially due to colonias. In order to protect Hispanic/Latinx communities

to who reside in colonias policies should focus on addressing infrastructural and zoning issues, housing conditions, and market dysfunction in these communities.

5.3. Limitations

This study has a number of limitations that merit discussion. The largest limitation that appeared in the study was the inability to accurately analyze disparities for Native American, as there are not enough counties with over 5,000 Native American households. A second limitation entailed the availability of data. For example, the 2013-2017 American Community Survey 5-Year Estimates were used to collect the data of Tenure by Age of Householder by Units in Structure, which for the mobile home units also included boat homes. However, for the 2013-2017 American Community Survey 5-Year Estimates when collecting the data Units in Structure for each specific race separated the mobile homes category from the category of Boats, RVs and Vans. Being able to incorporate RVs and Vans into the manufactured housing data could have provided different insights, as a younger generation has begun to embrace their sole residence as a functioning (RV or Van) mobile home. In addition, there could be other important variables that were not included in this study, as is suggested by the low r-squared. Furthermore, occupancy may not have been the ideal way to measure this effect. The American Community Survey can distinguish between reports of owning and renting a home but cannot distinguish between owning and renting land, which is essential to the discussion of mobile homes. The occupancy comparisons used also offered greater flexibility in analysis with each section of the population (a particular race or ethnicity) was compared to the population as a whole, however disparity could be analyzed more closely when comparing each section of the population to the dominant population (Non-Hispanic White). Lastly, this study did not analyze changes in the

disparity over time, which could highlight factors associated with the exacerbation or amelioration of these disparities over time.

5.4. Further Research

This study also points toward the need for additional research. For example, future research could incorporate data on exclusionary zoning in order to identify what are the most common exclusionary zoning practices used by municipalities against mobile homes, and how they affect the opportunity for communities of color to purchase and reside in mobile homes. Gathering the most common forms of exclusionary zoning could also help identify what are the best ways to combat this issue, therefore increasing the opportunity for communities of color to access affordable housing.

Another study that would contribute to the current literature would be a case study of mobile home parks in Midwestern states, where residents are mostly people of color. The Midwest is often an outlier in general spatial trends of where mobile homes are located. A survey of these residents could help identify why they reside there, how to increase the amount of mobile homes in the Midwest, and therefore add additional affordable housing opportunities for communities of color. Another sampling of case studies from communities of color across the United States, both who do and do not live in a mobile home park could help distinguish the perception of mobile homes around the "American Dream" of homeownership and generational wealth. As communities of color have not been afforded the opportunity to build generational wealth via discriminatory practices, the perception of mobile homes as depreciating in value and not building generational wealth may prevent them from investing in manufactured housing. Surveying people of color to understand these perceptions may help to inform policy to encourage mobile homeownership for communities of color.

APPENDIX

APPENDIX

Table 8: Original Descriptive Statistics

Variable	Obs	Mean	Std. Dev.	Min	Max
gisjoin	0				
TtlBlckOccHU	3,220	4543.059	20187.81	0	465032
TtlNAOccHU	3,220	264.8177	1017.07	0	22684
TtlWteOccHU	3,220	25257.97	60045.75	0	1190165
TtlLtxOccHU	3,220	5076.907	32497.63	0	1226260
state	0				
county	0				
Division	0				
BlckMHD	2,802	-2.599103	13.93477	-47.92322	98.63606
NAMHD	2,775	1.673812	21.46251	-52.18273	97.16422
WteMHD	3,207	-1.30544	3.010866	-26.84746	25.17969
LtxMHD	3,157	3.594325	16.09556	-51.83678	98.63606
BlckHOD	2,802	-24.42636	26.14449	-88.31291	48.41569
NAHOD	2,775	-9.631213	29.63854	-88.31291	61.7462
WteHOD	3,207	3.454565	6.268564	-78.96198	41.55199
LtxHOD	3,157	-19.08871	21.24332	-85.21739	41.06228
TotalGeoArea	3,221	97010.66	309298.8	82	9818605
UrbanArea	3,221	78468.34	305342.7	0	9759181
InUrbanAreas	3,221	69326.95	304572.3	0	9743650
InUrbanClu~s	3,221	9141.393	13673.53	0	175572
RuralArea	3,221	18542.32	16651.25	0	146856
PctRural	3,221	57.52498	32.04011	0	100
PctUrbanClus	3,221	22.51436	24.16019	0	100
PctUrbanArea	3,221	62.43568	62.09513	0	200
MH1534AgeO~c	3,220	162.4407	249.6355	0	3930
MH3564AgeO~c	3,220	862.0941	1366.29	0	20152
MH65Plu~rOcc	3,220	488.1519	1246.044	0	26654
MH1534AgeR~c	3,220	195.2087	339.5609	0	6017
MH65Plu~tOcc	3,220	77.2972	177.3234	0	3675

Table 8 (cont'd)

MH3564AgeR~c	3,220	337.322	632.6105	0	10221
PctBlckOccMH	2,802	9.945402	16.53904	0	100
PctNAOccMH	2,775	13.91224	22.76215	0	100
PctWteOccMH	3,207	11.41827	8.988282	0	60.04728
PctLtxOccMH	3,157	16.10779	19.17874	0	100
PctMH	3,220	12.67402	9.697776	0	58.17656
DivisionCode	3,220	5.06677	2.097991	0	9
PctElderly	3,183	25.70974	11.51644	0	100
_est_m1	3,223	0.1312442	0.3377196	0	1
_est_m2	3,223	0.1200745	0.325099	0	1
_est_m3	3,223	0.629848	0.4829201	0	1

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